

Pro-face

GP-2401/2501/2601 Series User Manual



Preface

Thank you for purchasing the Pro-face GP-2401/2501/2601 Series programmable operator interface (hereafter referred to as the "GP unit").

This GP unit, with its expanded functionality and improved overall performance, is an upgrade of Pro-face's previous GP series panels. GP-2401/2501/2601 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 GP correctly and safely.

Also, in this manual's examples, the Mitsubishi MELSEC-AnA Series PLC is referred, whenever possible, as a point-to-point connection.

- <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, please 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.

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Table of Contents

Pref	face				
Esse	Essential Safety Precautions 6				
Gen	eral Sa	fety Precautions			
GP-	GP-2401/2501/2601 Series Models				
Pacl	kage Co	ontents			
UL/	c-UL A	Application Notes			
CE	Marki	ng Notes 14			
Rev	ision V	ersion			
Doc	umenta	ation Conventions			
CHAPTE	R 1	INTRODUCTION			
1.1	Prior	to Operating the GP1-1			
1.2	System	m Design1-2			
	1.2.1	GP-2401/2501/2601 Series System Design			
1.3	Acces	sories1-5			
CHAPTE	R 2	SPECIFICATIONS			
2.1		SPECIFICATIONS ral Specifications2-1			
	Gener	ral Specifications2-1			
	Gene 2.1.1	ral Specifications 2-1 Electrical 2-1			
	Gener 2.1.1 2.1.2 2.1.3	Tal Specifications 2-1 Electrical 2-1 Environmental 2-2			
2.1	Gener 2.1.1 2.1.2 2.1.3	Tal Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct	Tal Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 Etional Specifications 2-4			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2	Tal Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 tional Specifications 2-4 Display 2-4			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2	ral Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 tional Specifications 2-4 Display 2-4 Memory 2-5			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2 2.2.3 2.2.4	ral Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 tional Specifications 2-4 Display 2-4 Memory 2-5 Touch Panel • Clock 2-5			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2 2.2.3 2.2.4	ral Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 tional Specifications 2-4 Display 2-4 Memory 2-5 Touch Panel • Clock 2-5 Interfaces 2-6			
2.1	Gener 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2 2.2.3 2.2.4 Interf	ral Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 cional Specifications 2-4 Display 2-4 Memory 2-5 Touch Panel • Clock 2-5 Interfaces 2-6 face Specifications 2-7			
2.1	General 2.1.1 2.1.2 2.1.3 Funct 2.2.1 2.2.2 2.2.3 2.2.4 Interface 2.3.1	ral Specifications 2-1 Electrical 2-1 Environmental 2-2 Structural 2-3 tional Specifications 2-4 Display 2-4 Memory 2-5 Touch Panel • Clock 2-5 Interfaces 2-6 Face Specifications 2-7 Serial Interfaces 2-7			

2.5	Dimens	ions	2-13
	2.5.1	GP-2401 Series External Dimensions	2-13
	2.5.2	GP-2501 Series External Dimensions	2-14
	2.5.3	GP-2601 Series External Dimensions	2-15
	2.5.4 F	Panel Cut Dimensions	2-16
	2.5.5 I	nstallation Fasteners	2-16
CHAPTE	R 3 IN	STALLATION AND WIRING	
3.1	Installa	tion	3-1
	3.1.1 I	nstallation Procedures	3-1
3.2	Wiring	Precautions	3-6
	3.2.1	Connecting the Power Cord	3-6
	3.2.2	Connecting the Power Supply	3-8
	3.2.3	Grounding	3-9
	3.2.4 I	O Signal Line Placement	3-9
3.3	Tool Co	nnector	3-10
3.4	CF Car	d Installation and Removal	3-11
	3.4.1	CF card Handling	3-13
2.5	A	ng the Screw Lock Terminal Block	2 14
3.5	Attachi	ng the Screw Lock Terminal Block	3-14
CHAPTE		ATA TRANSFER	3-14
	R 4 DA		
СНАРТЕ	R 4 DA	ATA TRANSFER	4-1
CHAPTE 4.1	R 4 DA Serial D Etherne	ATA TRANSFER Data Transfer	4-1 4-4
4.1 4.2	Serial D Etherne CF Mer	ATA TRANSFER Data Transferet Data Transfer	4-1 4-4 4-5
4.1 4.2 4.3	Serial D Etherne CF Mer 4.3.1	ATA TRANSFER Data Transfer et Data Transfer mory Loader Tool	4-1 4-4 4-5
4.1 4.2 4.3	Serial D Etherne CF Mer 4.3.1 I	ATA TRANSFER Data Transfer et Data Transfer mory Loader Tool Data Upload and Download	4-1 4-4 4-5 4-6
4.1 4.2 4.3	Serial D Etherne CF Mer 4.3.1 I	ATA TRANSFER Data Transfer et Data Transfer mory Loader Tool Data Upload and Download FFLINE MODE	4-1 4-4 4-5 4-6 5-1
4.1 4.2 4.3	Serial D Etherne CF Mer 4.3.1 I ER 5 OI Enterin 5.1.1 A	ATA TRANSFER Data Transfer et Data Transfer mory Loader Tool Data Upload and Download FFLINE MODE g OFFLINE Mode	4-1 4-4 4-5 4-6 5-1
4.1 4.2 4.3	Serial D Etherne CF Mer 4.3.1 I ER 5 OI Enterin 5.1.1 A 5.1.2 F	ATA TRANSFER Data Transfer et Data Transfer mory Loader Tool Data Upload and Download FFLINE MODE After Plugging in the Power Cord	4-1 4-4 4-5 4-6 5-1 5-1 5-2
4.1 4.2 4.3 CHAPTE 5.1	Serial D Etherne CF Mer 4.3.1 I ER 5 OI Enterin 5.1.1 A 5.1.2 F OFFLIN	ATA TRANSFER Data Transfer	4-1 4-4 4-5 4-6 5-1 5-1 5-2 5-3
4.1 4.2 4.3 CHAPTE 5.1	Serial D Etherne CF Mer 4.3.1 I ER 5 OI Enterin 5.1.1 A 5.1.2 F OFFLIN	ATA TRANSFER Data Transfer The total Transfe	4-1 4-4 4-5 4-6 5-1 5-1 5-2 5-3 5-4
4.1 4.2 4.3 CHAPTE 5.1 5.2 5.3	Serial D Etherne CF Men 4.3.1 I ER 5 OI Enterin 5.1.1 A 5.1.2 F OFFLIN INITIA SELF-D	ATA TRANSFER Data Transfer The total Transfe	4-1 4-4 4-5 4-6 5-1 5-1 5-2 5-3 5-4
4.1 4.2 4.3 CHAPTE 5.1 5.2 5.3 5.4	Serial DE Etherne CF Mer 4.3.1 I ER 5 OI Enterin 5.1.1 A 5.1.2 F OFFLIN INITIA SELF-DE ER 6 IN	ATA TRANSFER Data Transfer	4-1 4-4 4-5 4-6 5-1 5-1 5-2 5-3 5-6

Preface

0.3	SYSTEM ENVIRONMENT SETUP	0-3
	6.3.1 SYSTEM SETUP	6-3
	6.3.2 SYSTEM AREA SETUP	6-4
	6.3.3 GLOBAL WINDOW SETUP	6-6
	6.3.4 CHARACTER STRING DATA SETUP	6-7
6.4	SET UP I/O	6-10
	6.4.1 SET UP SIO	6-10
	6.4.2 SET UP PRINTER	6-12
	6.4.3 SET UP TOUCH PANEL	6-15
	6.4.4 COMMUNICATION SETUP	6-18
	6.4.5 Sound Settings	6-19
	6.4.6 EXPANSION SERIAL COMMUNICATION SETUP	6-20
	6.4.7 EXPANSION SERIAL ENVIRONMENT SETUP	6-21
	6.4.8 SETUP CAPTURE OPERATION	6-21
	6.4.9 DISPLAY DEVICE SETTINGS	6-22
	6.4.10 FUNCTION SETUP	6-22
	6.4.11 COMMUNICATION PORT SETUP	
6.5	PLC SETUP	6-24
	6.5.1 SET UP OPERATION SURROUNDINGS(1:1/n:1)	6-24
	6.5.2 STATION SETUP(n:1)	
	6.5.3 CUSTOMIZE SETUP (n:1)	6-27
6.6	INITIALIZE INTERNAL MEMORY	6-29
	6.6.1 INITIALIZE GP MEMORY	6-29
	6.6.2 INITIALIZE CF CARD	6-29
	6.6.3 CSV DATA INDEX	6-30
6.7	SET UP TIME	6-31
6.8	SET UP SCREEN	6-32
CHAPTE	ER 7 RUN MODE AND ERRORS	
7.1	RUN Mode	7.1
7.1	7.1.1 After Connecting the Power Cord	
	7.1.2 Via OFFLINE Mode	
7.2	SELF-DIAGNOSIS	
, • <u>a</u>	7.2.1 SELF-DIAGNOSIS ITEM LIST	
	7.2.2 SELF-DIAGNOSIS - Details	
	, 2.2 SELI DITIOTIONS DOMING	/ Г

7.3	Troub	oleshooting7-8
	7.3.1	Possible Types of Trouble
	7.3.2	No Display7-9
	7.3.3	No GP/Host Communication
	7.3.4	Touch Panel Does Not Respond
	7.3.5	Buzzer Sounds when GP power is turned ON7-15
	7.3.6	Clock Settings Cannot be Entered
	7.3.7	Error Screens
7.4	Error	Messages7-17
	7.4.1	Error Message List
7.5	Error	Message Details7-19
	7.5.1	SYSTEM ERRORS7-19
	7.5.2	ILLEGAL ADDRESS IN SCREEN DATA7-21
	7.5.3	PLC COM. ERROR7-22
	7.5.4	CLOCK SET UP ERROR7-23
	7.5.5	SCREEN TAG LIMIT EXCEEDED (max. of 384)7-23
	7.5.6	OBJ. PLC HAS NOT BEEN SETUP7-23
	7.5.7	D-Script and Global D-Script Errors7-24
	7.5.8	Extended SIO Script Error
	7.5.9	Serial I/F Change Error
CHAPTE	R 8 I	MAINTENANCE
8.1	Regul	ar Cleaning8-1
	8.1.1	Cleaning the Display8-1
	8.1.2	Installation Gasket Check/Replacement 8-1
8.2	Perio	dic Check Points8-3
8.3	Repla	cing the Backlight8-4
	8.3.1	Replacing CA3-BLU12-01
INDEX		

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 this unit.

Safety Icons

Throughout this manual the following icons are provided next to GP operation procedures requiring special attention, and provide essential safety information. These icons indicate the following levels of danger:



Indicates situations where severe bodily injury, death or major equipment damage can occur.

Indicates situations where slight bodily injury or machine damage can occur.

MARNINGS

System Design

- Do not create GP touch panel switches that could possibly endanger the safety of equipment and personnel. Damage to the GP, its I/O unit(s), cable(s), and other related equipment can cause an output signal to remain continuously ON or OFF and possibly cause a major accident. Therefore, design all monitoring circuits using limit switches, etc. to detect incorrect device movement. To prevent accidents related to incorrect signal output or operation, design all switches used to control vital machine operations so they are operated via a separate control system.
- Please design your system so that equipment will not malfunction due to a communication fault between the GP and its host controller. This is to prevent any possibility of bodily injury or material damage.
- Do not use the GP unit as a warning device for critical alarms that can cause serious operator injury, machine damage or production stoppage. Critical alarm indicators and their control/activator units must be designed using stand-alone hardware and/or mechanical interlocks.
- The GP is not appropriate for use with aircraft control devices, aerospace equipment, central trunk data transmission (communication) devices, nuclear power control devices, or medical life support equipment, due to these devices' inherent requirements of extremely high levels of safety and reliability.

MARNINGS

- Do not create switches used to control machine safety operations, such as an emergency stop switch, or a GP touch screen icon. Be sure to install these switches as separate hardware switches, otherwise severe bodily injury or equipment damage can occur.
- When using the GP with: transportation vehicles (trains, cars and ships), disaster and crime prevention devices, various types of safety equipment, non-life support related medical devices, etc., redundant and/or failsafe system designs should be used to ensure the proper degree of reliability and safety.

Touch Panel

After the GP's backlight burns out, unlike the GP's
 "Standby Mode", 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 machine operation error can occur.

If your GP's backlight suddenly turns OFF, use the following steps to determine if the backlight is actually burned out.

- 1) If your GP is not set to "Standby Mode" and the screen has gone blank, your backlight is burned out.
- 2) Or, if your GP is set to Standby Mode, but touching the screen does not cause the display to reappear, your backlight is burned out.

Also, use the GP's built-in "USE TOUCH PANEL AFTER BACKLIGHT BURNOUT" feature to prevent an accidental machine operation error. This feature can automatically detect a burnout and disable the touch screen.

Wiring

- To prevent an electric shock, be sure to confirm that the GP's power cord is not connected to the main power when connecting power lines to the GP.
- Be sure to replace the GP's plastic terminal block cover after wiring is completed, since operating the GP without the cover may lead to an electric shock
- Do not use power beyond the GP's specified voltage range. Doing so may cause a fire or an electric shock.

WARNINGS

Battery Replacement

 The GP uses a lithium battery for backing up its internal clock data. If the battery is incorrectly replaced, the battery may explode. To prevent this, please do not replace the battery yourself. When the battery needs to be replaced, please contact your local GP distributor.

Installation/Maintenance

- High voltage runs through the GP. Except for replacing the backlight, never take apart the GP, otherwise an electrical shock can occur.
- Do not modify the GP unit. Doing so may cause a fire or an electric shock.
- Do not use the GP in an environment where flammable gasses are present, since operating the GP may cause an explosion.



Installation/Maintenance

Be sure to securely connect all cable connectors to the GP.
 A loose connection may cause incorrect input or output.



Wiring

- Ground the GP's FG line separately from other units' FG lines. Putting these FG lines too close may cause an electric shock or unit malfunction. Be sure to use a grounding resistance of 100Ω or less and a 2mm² or thicker wire, or your country's applicable standard.
- Be sure the GP's rated voltage is within the designated range, and that the power terminal lines are correctly attached. If the voltage supplied differs from the rated voltage, or incorrect wiring or grounding is performed, it may cause a fire or unit malfunction.
- Use only the designated torque to tighten the GP's terminal block screws. If these screws are not tightened firmly, it may cause a short-circuit, fire, or GP malfunction.
- Be careful that metal filings and wiring debris do not fall inside the GP, since they can cause a fire, GP malfunction, or incorrect unit operation.

Display Device/CF Card

- The liquid crystal panel contains a powerful irritant and if for any reason the panel is damaged and this liquid contacts any part of your body, be sure to wash that area with running water for 15 minutes. If any of this liquid enters your eye, flush your eye for 15 minutes with running water and contact a physician.
- Prior to inserting or removing a CF Card, be sure the CF Card ACCESS lamp is not lit. If you do not, CF Card internal data may be damaged or lost.
- While a CF Card is being accessed, NEVER turn OFF or reset the GP, or 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 GP-PRO/PB III for Windows Tag Reference Manual (included in the screen editor software package)

Unit Disposal

 When this unit is disposed of, it should be done so according to your country's regulations for similar types of industrial waste.

General Safety Precautions



- 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's naturally occurring rear-face ventilation, or store or use the GP in an environment that is too hot.
- Do not use this unit in areas where large, sudden temperature changes can occur. These changes can cause condensation to form inside the unit, possibly causing the unit to malfunction.
- Do not allow water, liquids, metal or charged particles to enter inside the GP's case, since they can cause either a GP malfunction or an electrical shock. The allowable pollution degree is 2.
- Do not use or store the GP in direct sunlight, or in excessively dusty or dirty environments.
- Do not store or use the unit where strong jolting or excessive vibration can occur.
- Do not store or use the GP where chemicals (such as organic solvents, etc.) and acids can evaporate, or 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 display in areas receiving direct sunlight, since the sun's UV rays may cause the LCD display's quality to deteriorate.
- Storing this unit in areas at a temperature lower than is recommended in this manual's specifications may cause the LCD display's liquid to congeal, which may damage the panel. Conversely, if the storage area's temperature becomes higher than the allowed level, the LCD'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 those specified in this manual.
- Do not connect or disconnect the communication cable between the GP and the host while power is ON.



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

■ About the GP's Display Panel

- The GP's currently displayed data, its voltage*1 and brightness setting each affect the intensity of Contouring. (i.e, when some parts of the screen are brighter than others, creating a wavelike pattern)
- There are minute grid-points (dark and light) on the Display Panel's surface. This is part of the GP's design and not a defect.
- Extended shadows, or "Crosstalk" may appear on the sides of screen images. This is normal for an LCD display.
- Sometimes the display area may look as if the display colors have changed. This is a common attribute of LCD's and is not a defect.
- Displaying a single image for long periods can cause an afterimage to remain when the display is changed to another screen.

To prevent this effect:

 Use the GP's "Stand-by Mode", which automatically turns the screen OFF when there is no input for a specified period of time.

▼Reference 5.3.1 System Setup

- Write "FFFFh" to the System Data Area's "Screen Display Off" address ² to turn the screen display OFF when the following actions are not performed for the user's designated period of time.
 - Change Screen
 - Touch Screen
 - Alarm Display
- Do not display any single screen for a long period of time. Try to periodically change the screen display.

▼Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual

^{*1} If the GP's voltage is at the very low end of its allowable range, it may effect the intensity of contouring.

^{*2} The following addresses assume all System Data Area settings are entered. If they are not all entered, the correct word address may be different from those given here.

With the Direct Access Method — use System Data Area word address +9

With the Memory Link Method — use System Data Area word address +12

GP-2401/2501/2601 Series Models

The GP-2401/2501/2601 Series refers to the following GP model numbers:

Series		Model Name	Model Type	Comments	GP Type in Screen Creation Software
	GP-2401 Series	GP-2401T	GP2401-TC41-24V	UL/cUL Approved, CE Marked	GP2401
		GP-2501T	GP2501-TC11	UL/cUL Approved*1, CE Marked	GP2501
		OI -23011	GP2501-TC41-24V		
GP2000	GP-2501 Series		GP2501-SC41	*2	0005040
Series	GP-2501S GP-2501L	GP-25015	GP2501-SC11-24V	UL/cUL Approved, CE Marked	GP2501S
		GP-2501L	GP2501-LG41-24V	UL/cUL Approved*1, CE Marked	GP2501L
	GP-2601	GP-2601T	GP2601-TC11	*2	OFFICA A
	Series		GP2601-TC41-24V	UL/cUL Approved, CE Marked	GP2601

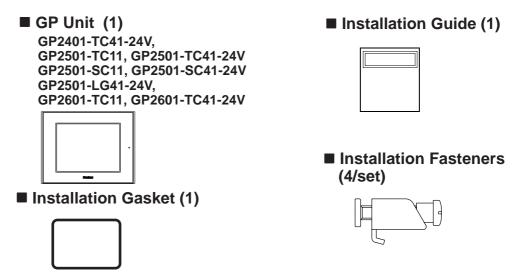
^{*1} UL1604 for UL hazardous locations ends on July 31, 2012.

As a result, for models produced from August 1, 2012 onward, UL1604 will not apply. Please refer to the Pro-face home page for more details.

http://www.pro-face.com/worldwide/safety/ul.html

Package Contents

The GP's packing box contains the items listed below. Please check to confirm that all items shown below have been included.



This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local GP distributor immediately for prompt service.

^{*2} Revised models may or may not conform to UL/c-UL and CE Markings, depending on the revision version.

[▼]Reference For information on how to determine the revision version, see "Revision Version" (page 14).

UL/c-UL Application Notes

The GP2401-TC41-24V, GP2501-SC41-24V, GP2601-TC41-24V are UL/c-UL listed products. (UL file No.E182139)

The GP2501-TC11*1, GP2501-SC11*1, GP2601-TC11*1 are UL/c-UL recognized components. (UL file No.E171486 or E231702)

These units conform to the following standards:

Model	UL		Standards					
Wiodei	registered	Α	В	С	D	E	F	G
GP2401-TC41-24V	3180034-01	0		0	0			
GP2501-TC11*1	3180021-03		0				0	
GP2501-TC41-24V	2880045-01							
GP2501-SC11*1	3180021-04		0				0	
GP2501-SC41-24V	2980078-02	0		0		0		0
GP2501-LG41-24V	3180045-01							
GP2601-TC11*1	3180021-05		0	0			0	0
GP2601-TC41-24V	2880045-02	0		0		0		0

^{*1} All GP units marked Revision "3" conform to UL/c-UL standard requirements.

Reference For more information on how to determine the revision version, see "Revision Version" (page 14).

- A) <u>UL508</u> Industrial Control Equipment
- **B)** <u>UL60950</u> Safety Standard for Information Technology Equipment (3rd Edition, issued December 1, 2001)
- C) <u>UL1604</u> Electrical Equipment for use in Class 1 & 2 Division 2, or Class 3 Hazardous Locations.
- **D)** <u>CSA-C22.2, Nos. 142, and 213-M1987 (c-UL Approval)</u> Safety Standard for Information Technology and Electrical Business Equipment
- E) CAN/CSA-C22.2 No. 1010-1 (c-UL Approval)
 - Safety Requirement for Electrical Equipment for Measurement, Control and Laboratory Use
- F) <u>CAN/CSA-C22.2</u>, No. 60950-00 (c-UL Approval) Safety Standard for Information Technology Equipment (3rd Edition, issued December 1, 2001)
- G) <u>CSA-C22.2, No. 213-M1987 (c-UL Approval)</u> Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations.

<Cautions>

- GP units must be used as a built-in component of an end-use product.
- GP units must be used indoors only.
- GP units should be installed in the front face of a metal panel.
- If this unit is installed so as to cool itself naturally, be sure to install it in a vertical panel. Also, be sure that the GP unit is mounted at least 100 mm away from any adjacent structures or equipment. If these requirements are not met, the heat generated by the GP unit's internal components may cause the unit to fail to meet UL/c-UL standard requirements.
- Be sure to create a power ON/OFF switch for the GP on or in the end-use product that the GP unit is built-in. Be sure to consider the current and voltage levels when installing the switch.
- Be sure that the end-use the product uses a UL60950 approved structure.

UL1604 Conditions of Acceptability and Handling Cautions:

- 1. Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods Article 501- 4(b) of the National Electrical Code, NFPA 70 within the United States, and in accordance with Section 18-152 of the Canadian Electrical Code for units installed within Canada.
- 2. Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations
- 3. WARNING: Explosion hazard substitution of components may impair suitability for Class I, Division 2.
- 4. WARNING: Explosion hazard when in hazardous locations, turn off power before replacing or wiring modules.
- 5. WARNING: Explosion hazard do not disconnect equipment unless power has been switched OFF, or the area is known to be non-hazardous.
- 6. WARNING: Explosion hazard do not connect/ disconnect equipment unless area is known to be nonhazardous. Port is for system set up and diagnostics.

CE Marking Notes

The GP2401-TC41-24V, GP2501-TC41-24V, GP2501-SC41-24V, GP2501-LG41-24V, GP2601-TC41-24V are CE marked products that conform to EMC directives. The GP2501-TC11*1, GP2501-SC11*1 and GP2601-TC11*1 are CE marked products that conform to EMC directives and the Low-voltage directive.

For the detailed information on CE Marked, be downloaded and refer the Declaration of Conformity from Pro-face Home Page.

Home Page URL http://www.pro-face.com/

*1 All GP units marked Revision "3" conform to CE Marking standard requirements.

Reference For more information on how to determine the revision version, see "Revision Version" (page 15).

Revision Version

The revision version can be determined by the identification label or revision stickers that are placed on the main unit of the GP. The characters and numerals in the "REV" area that are replaced with asterisks (*), or marked with a marker indicate the revision version.

In the example below, the asterisks "*" are placed at positions "D", "1", and "2", which indicates the revision version as "D, 1, 2".



Identification Label



Revision Sticker

Documentation Conventions

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

Symbol	Description			
Important	Indicates important information or procedures that must be followed for correct and risk-free software/device operation.			
*1	ndicates useful or important supplemental information.			
1) , 2)	Indicates steps in a procedure. Be sure to perform these steps in the order given.			
Reference	Refers to useful or important supplemental information.			
Note:	Provides useful or important supplemental information.			
Indicates the GP-PRO/PBIII for Windows screen editor software (version 6.10 or higher *1). For information on how to confirm the version, refer to the "GP-P for Windows Operation Manual", which is supplied with the GP seditor software.				
PLC	Abbreviation for Programmable Logic Controller.			
n:1	Indicates a multi-link type connection is used.			

^{*1} GP-PRO/PB III for Windows under Ver.6.22 does not support the following GP units.

	Ver.6.10 to Ver.6.1*	Ver.6.20 to Ver.6.21
Not suported GP units	GP-2401T	
	GP-2501L	GP-2501L
GP UIIIS	GP-2601T	

If you install the add-on software, the above GP units will be available.

You can download the add-on software from Pro-face's web site.

(http://www.pro-face.com/)

Chapter

- 1. Prior to Operating the GP
- 2. System Design
- 3. Accessories

Introduction

1.1 **Prior to Operating the GP**

Be sure to follow these steps when creating projects for the GP unit.

1 Preparation Before using the GP, check that all required hardware is

present and read all specification, wiring, and

installation information.

▼ Reference Chapter 2, "Specifications" and Chapter 3,

"Installation and Wiring"

2 Screen Design Create a sample screen and design a Tag layout, with

the Screen layout sheets and Tag lists provided in the

Editor software.

▼ Reference ▼ GP-PRO/PBIII for Windows Operation

Manual

3 Select GP and Using the input areas provided, select the GP and the

PLC types to be used.

▼Reference GP-PRO/PBIII for Windows Operation

Manual

Reference GP-PRO/PBIII for Windows Tag

Reference Manual

4 Create Screen/Run Setup the screen and tags in your screen editing **Screen Setup**

software according to your Screen Design.

Reference GP-PRO/PBIII for Windows Operation

Manual and Tag Reference Manual

5 Transfer Screen Data Transfer the data from the Screen editor software on

your PC to the GP unit using the Data Transfer Cable.

▼ Reference ▲ GP-PRO/PBIII for Windows Operation

Manual

6 GP/Host Connection Set up the GP so that it can receive data from the Host

(PLC).

PLC types

▼Reference Chapter 6, "Initialize", and GP-PRO/

PBIII for Windows Device/PLC Connection Manual

7 Connect the GP Link the GP with the host (PLC) using the appropriate

connection cable (different cables may be necessary for

different hosts), and then operate the unit.

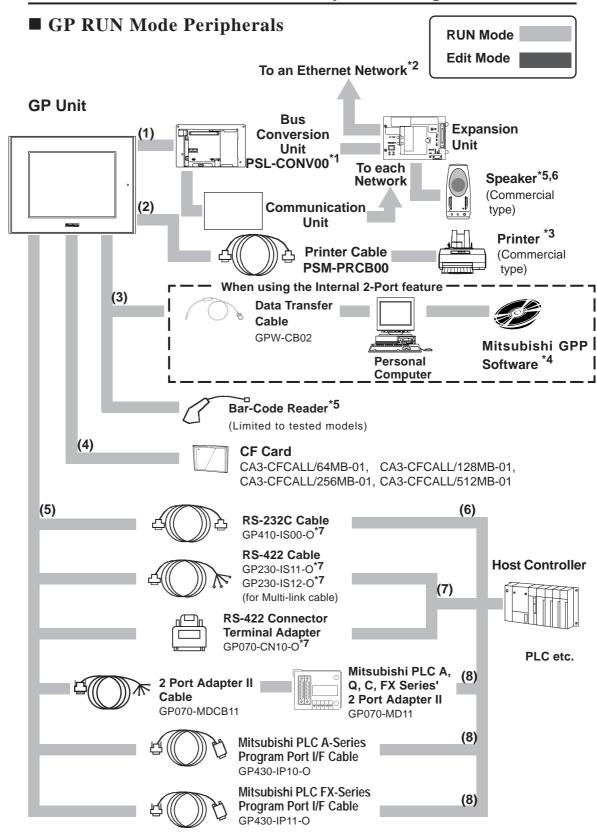
▼Reference GP-PRO/PBIII for Windows Device/

PLC Connection Manual

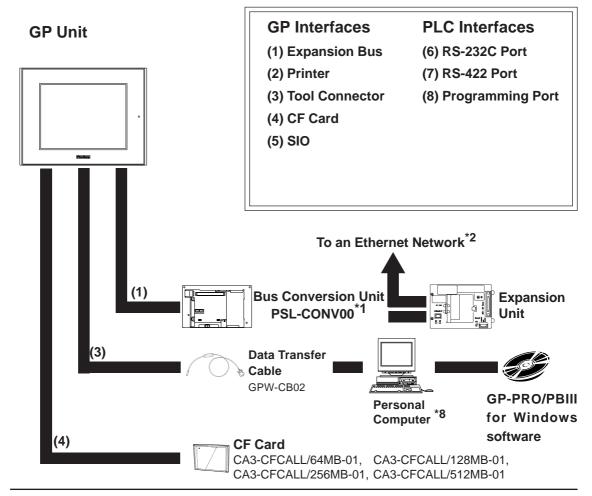
1.2 System Design

The following diagram represents the standard items connected to the GP.

1.2.1 GP-2401/2501/2601 Series System Design



■ GP Edit Mode Peripherals



^{*1} GP-2501T, GP-2501S, GP-2501L and GP-2601T units can use this unit, however the GP-2401T unit can not.

Printers designed solely for Windows may not be used. Certain printers containing both Windows and DOS drivers may be used. For details, please contact your printer's manufacturer or sales outlet.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen editor software)

- *5 See Page 1-4 for recommended units.
- *6 The optional Bus Conversion unit and Sound Output unit (Multi Unit S or Multi Unit E) are required to connect the GP-2501/2601 Series to speakers.
- *7 Certain types and models of PLCs cannot be connected.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen editor software)

*8 Certain types and models of PCs cannot be connected.

Reference GP-PRO/PBIII for Windows Operation Manual (included with the screen editor software)

^{*2} The optional Bus Conversion Unit and the Ethernet Unit are required to connect a GP-2501/2601 Series to an Ethernet network.

^{*3} Compatible with NECPC-PR201/PL, EPSON ESC/P24-J84(C), HP Laser Jet PCL 4 command printers, EPSON PM/Stylus (6-color ink), EPSON Stylus (4-color ink) printers or their equivalent that are designed for MS-DOS.

^{*4} About certain types and models of PLC and software, see:

Chapter 1 - Introduction

■ Recommended Units

The following tables list I/O devices that have been confirmed to be compatible with the GP. If you connect a device other than those listed below, be sure to confirm that the connection functions correctly using an actual unit.



Recommended units are subject to change without notice.

◆ Bar code readers (Connected to Tool Connector)

Manufacturer	Model	Туре	Description
Aimex	BR-331 PC2	Pen	
Corporation	DK-331 PG2	reii	
	OPT-1105-RSK 98 Set	Touch Scanner (Read Width: 60mm)	
OPT Electronics	OPT-5105-RSK 98 Set	Touch Scanner (Read Width: 80mm)	
	OPL-6735-RSK 98 Set	Touch Scanner (Read Width: 100mm)	
	TCD-5510M	Touch Scanner (Read Width: 65mm)	
Tohken	TCD-5510L	Touch Scanner (Read Width: 82mm)	
	TCD-5510W	Touch Scanner (Read Width: 105mm)	
	BCK5435-STA	Touch Scanner (Read Width: 56mm)*1*2	Includes Y cable for
NEC Infrontia	DCN3433-31A	Touch Scanner (Read Widin: Somm)	connection cable
	BCK5535-STA	Touch Scanner (Read Width: 85mm)*1*2	Includes Y cable for
	DONOUS-STA	i ouch Scanner (Redu Widin: 8511111)	connection cable

^{*1} Be sure to use the Y cable included with the unit and connect it between the GP unit and a bar code reader. Data cannot be read correctly, if a non-"Y" cable is used, or if the bar code reader is connected directly to the GP unit.

♦ Speaker

The optional Bus Conversion unit and Sound Output unit (Multi Unit S or Multi Unit E) are required to connect the GP-2501/2601 Series to speakers.

Manufacturer	Model	Connected Via
Arrow Electronics Ind. Co., Ltd.	NS-38	SP OUT, GND
7410W Electronics ind. 66., Etc.	NS-105	31 001,0110



lote: Speakers connected to LINE OUT require an amplifier.

^{*2} The following settings must be entered prior to using the bar code reader with a GP unit. 1) Set the CAPS.

²⁾ Add the Carriage Return (CR) in the Postamble's settings. For the details about these settings, please refer to the Installation Guide included with the bar cord reader unit.

1.3 Accessories

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

■ Available Software

Product Name	Model No.	Description
GP-PRO/PB III	GPPRO-CNT01W-P02*1	Software to be used to create the GP's
C-Package02 (GP-PRO/PB III for		screen data. Installed in a personal
Windows Ver. 6.10 or		computer.
later)		

^{*1} GP-PRO/PB III for Windows under Ver.6.22 does not support the following GP units.

	Ver.6.10 to Ver.6.1*	Ver.6.20 to Ver.6.21
Not suported	GP-2401T	
Not suported	GP-2501L	GP-2501L
GP units	GP-2601T	

If you install the add-on software, the above GP units will be available.

You can download the add-on software from Pro-face's web site.

(http://www.pro-face.com/)

■ Tool Connector

Product Name	Model No.	Description
		Connects the GP to a personal computer.
Screen Data Transfer Cable	GPW-CB02	Transfers screen data and user
Transier Cable		program(s).

■ Serial Interfaces

Product Name	Model No.	Description	
RS-232C cable ^{*1}	GP410-IS00-O		
	GP230-IS11-0	Interface cables between the host (PLC)	
RS-422C cables ^{*1}	GP230-IS12-O	and the GP.	
	(for Multi-link)		
RS-422 Connector	GP070-CN10-O	Conversion adapter to convert serial data	
Terminal Adapter*1	GF070-CN10-O	to RS-422 format	
		Interface unit that allows use of both GP	
2 Port Adapter II	GP070-MD11	and Mitsubishi A, Q, C and FX series	
		peripheral equipment.	
2 Port Adapter II Cable	GP070-MDCB11	Connects the GP to 2 Port Adapter II.	
Mitsubishi A Series	GP430-IP10-O	Connects directly to Mitsubishi's PLC	
Programming Port I/F cable	OF 430-IF 10-0	Programming port. Simultaneous use of	
Mitsubishi FX Series		programming console, however, is not	
Programming Port I/F	GP430-IP11-O	possible.	
cable		possible.	

^{*1} For detailed information about the range of connectable PLC manufacturers and models,

▼Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual

Chapter 1 - Introduction

■ Printer Interface Cable

Product Name	Model No.	Description	
Printer Cable	PSM-PRCB00	Cable designed to connect the GP and	
	I SIVI-I ROBOO	a commercial type printer.	

■ Expansion Units

Product Name	Model No.	Description	
T-Link Unit ^{*1}	GP450-ZB21	Interface unit to connect the GP to a Fuji	
I-Link Unit		Electric Co. T-Link Network.	
DeviceNet Unit*1	GP070-DN41	Interface unit to connect the GP to a	
Devicemet Unit	GF070-DN41	DeviceNet Network. CE/UL	
Profibus-DP Unit*1	GP070-PF11	Interface unit to connect the GP to a	
Profibus-DP Unit	GF070-FF11	Profibus-DP Network. CE	
INTERBUS Unit*1	GP070-IB41	Interface unit to connect the GP to an	
INTERBUS UNIT	GP070-1641	INT ERBUS Network. CE/UL	
CC-Link Unit ^{*1}	GP070-CL11	Interface unit to connect the GP to a CC-	
CC-Link Unit		Link unit.	
MELSECNET/10 Unit ^{*1}	GP070-MNL11	Interface unit to connect the GP to a	
WELSECNET/10 Unit	GP070-MNB11	MELSECNET/10 unit.	
GP Ethernet I/F Unit ^{*1}	GP070-ET41	I/F unit used to connect the GP to an	
GP Ethernet I/F Unit		Ethernet network.	
Multi Unit S*1	GP077-MLTS11	Provides GP-2501/2601 Series units with	
Williti Unit S	IGPU/1-IVILI STI	a Sound output interface.	
NA142 11-24 F*1	CD077 MLT F 41	Provides GP-2501/2601 Series units with	
Multi Unit E ^{*1}	GP077-MLTE41	a Sound ouput and an Ethernet interface.	

^{*1} When using a GP70/77R Series Expansion Unit with a GP-2501/2601 Series unit, the optional Bus Conversion Unit (PSL-CONV00) is required.

■ Conversion Unit

Product Name	Model No.	Description	
		Required when using a GP70/77R Series	
Bus Conversion Unit	PSL-CONV00	Expansion Unit with a GP-2501/2601 series	
		unit	

■ CF Card Items

Product Name	Model No.	Description	
CF Cards	CA3-CFCALL/64MB-01	GP Series CF Card (64MB)	
	CA3-CFCALL/128MB-01	GP Series CF Card (128MB)	
	CA3-CFCALL/256MB-01	GP Series CF Card (256MB)	
	CA3-CFCALL/512MB-01	GP Series CF Card (512MB)	
CF Card Adaptor	GP077-CFAD10	CF Card Adapter for the PCMCIA Slot.	

■ Screen Protection

Product Name	Model No.	Description	
	PSL-DF00	Disposable, dirt-resistant sheet for the	
Screen Protection Sheet	(GP-2501/2601 Series)	GP's screen. The GP's touch panel ca	
Screen Protection Sheet	PS400-DF00	be operated with this cover sheet	
	(GP-2401 Series)	attached. (5 sheets/set)	
		Connecting to AUX I/O, the terminal car	
Screw Lock Terminal Block	GPM-AXCN01	be used for external reset, alarm output	
BIOCK		and buzzer output.	

■ Maintenance Items

They are available separately as optional maintenance items.

Product Name	Model No.	Corresponding GP	Rev.	Description
Backlight	PS400-BU00-MS	GP2401-TC41-24V	-	
	PS501S-BU00	GP2501-SC11	-	
	PS500S-BU00	GP2501-SC41-24V	-	
	GP577RT-BL00-MS	GP2501-TC11 GP2501-TC41-24V	-	Replacement Backlight
	CA3-BLU12-01	GP2601-TC11	Rev.4 is marked.*1	
		GP2601-TC41-24V	-	
	PS600-BU00	GP2601-TC11	Rev.4 is not marked.*1	
Installation Fastener	GP070-AT01	GP-2401 Series GP-2501 Series GP-2601 Series	-	Facteners to attach the GP to a panel. (4 fasteners/set)
Installation Gasket	PS400-WP00-MS	GP-2401 Series	-	Provides a moisture resistant seal when installing the GP.
	GP570-WP10-MS	GP-2501 Series GP-2601 Series	-	Same as the seal include in the GP's original equipment package.
Connector Cover	PS-BH00	GP-2401 Series GP-2501 Series GP-2601 Series	-	Attaches to GP rear face connectors.
Screw Lock Terminal Block	GPM-AXCN01	GP-2401 Series GP-2501 Series GP-2601 Series	-	This Connector is used for external reset, alarm output, buzzer output, or sound output.

Reference For more information on how to determine the revision version, see "Revision Version" (page 15).

^{*1} The corresponding backlight unit differs depending on GP2601-TC11 unit's marked Revision.

Memo



- 1. General Specifications
- 2. Functional Specifications
 - 5. Dimensions

4. Part Names and Functions

3. Interface Specifications

2 Specifications

2.1 General Specifications

2.1.1 Electrical

■ GP2501-TC11/GP2501-SC11/GP2601-TC11

Rated Voltage	AC100V	AC100V to AC240V ^{*1}	
Rated Voltage Range	AC85V to AC132V	AC85V to AC265V ¹	
Power Consumption	50VA or less	50VA or less (ACIN100V)*1	
Power Consumption	20 VA OF 1622	85VA or less (ACIN240V)*1	
Allowable Voltage Drop	20ms or less		
Voltage Endurance	AC1500V 20mA for 1 minute (between charging and FG terminals)		
Insulation Resistance	$10M_{\Omega}$ or higher at DC500V (between charging and FG terminals)		

^{*1} All GP units marked Revision "3" conform to the specifications.

Reference For more information on how to determine the revision version, see "Revision Version" (page 14).

■ GP2401-TC41-24V/GP2501-TC41-24V/GP2501-SC41-24V/GP2501-LG41-24V/GP2601-TC41-24V

	GP2401-TC41-24V	GP2501-TC41-24V GP2501-SC41-24V GP2501-LG41-24V GP2601-TC41-24V
Rated Voltage	DC	24V
Rated Voltage Range	DC19.2V to DC28.8V	
Power Consumption	28W or less 50W or less	
Allowable Voltage Drop	10ms or less	
In-rush Current	30A or less	
V. II	AC1000V 20mA for 1 minute	
Voltage Endurance (between charging and FG terminals)		and FG terminals)
In and a time. De pinto	$10 { m M}_{oldsymbol{\Omega}}$ or higher at DC500V	
Insulation Resistance	(between charging and FG terminals)	

Chapter 2 - Specifications

2.1.2 Environmental

	GP2401-TC41-24V		
	GP2501-TC41-24V	GP2501-TC11	
	GP2501-SC41-24V	GP2501-SC11	
	GP2501-LG41-24V	GP2601-TC11	
	GP2601-TC41-24V		
Ambient Operating			
Temperature	0°C to +	-50°C *1	
(Cabinet Interior)			
(Panel Face)			
Storage Temperature	-20°C to		
Operating Humidity	10%RH to	o 90%RH	
Operating numbers	(Non condensing, wet bulb	temperature: 39°C or less)	
_	10%RH to	o 90%RH	
Storage Humidity	(Non condensing, wet bulb temperature: 39°C or less)		
Atmosheric Endurance	800hPa to 1114hPa (2000 meters or lower)		
(GP Operation Altitude)			
Air Purity (Dust)	0.1mg/m ³ or less (non-conductive levels)		
Pollution Degree	Pollution Degree 2		
Corrosive Gasses	Free of corrosive gasses		
	IEC61131-2(JIS B		
	When vibration is NOT continuous		
Vibration Resistance	10Hz to 57Hz 0.075mm, 57Hz to 150Hz 9.8m/s ²		
Vibration Resistance	When vibration is continuous		
	10Hz to 57Hz 0.035mm, 57Hz to 150Hz 4.9m/s ²		
	X, Y, Z directions fo	or 10 times (80min.)	
Noise Voltage:		Noice Valtage, 1500\/n n	
Noise Immunity	1000Vp-p	Noise Voltage: 1500Vp-p	
(via noise simulator)	Pulse Duration:1µs	Pulse Duration: 1µs	
	Rise Time:1ns	Rise Time: 1ns	
Electrostatic Discharge	6kV (complies with IEC 61000-4-2 Level 3)		
Immunity	· '	,	

^{*1} When using GP-2501L/GP-2501S/GP-2601T in an environment where the temperature becomes or exceeds 40°C for an extended period of time, the screen contrast level may decrease from its original level of brightness.

2.1.3 Structural

	GP-2401 Series	GP-2501 Series	GP-2601 Series
Grounding	100Ω or less, or your country's applicable standard		
Ratings *1	Equivalent to IP65f (JEM 1030)		
(For front panel of installed unit)	NEMA#250 Type4X/12		
Weight	1.7 kg (5.5lb) or less 3.5kg (7.7lb) or less		
Cooling Method	Natural air circulation		
_	W215mm [8.46in] W317mm [12.48in]		
External Dimensions	x H170mm [6.69in] x H243mm [9.57in]		m [9.57in]
Dilliciisions	x D60mm [2.36in]	x D58mm [2.28in]	

^{*1} The front face of the GP unit, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the specification. Even though the GP unit's level of resistance is equivalent to these standards, oils that should have no effect on the GP can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to the unit for long periods of time. If the GP's front face protection sheet becomes peeled off, these conditions can lead to the ingress of oil into the GP and separate protection measures are suggested. Also, if non-approved oils are present, it may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing the GP be sure to confirm the type of conditions that will be present in the GP's operating environment. If the installation gasket is used for a long period of time, or if the unit and its gasket are removed from the panel, the original level of the protection cannot be guaranteed. To maintain the original protection level, you need to replace the installation gasket regularly.

2.2 Functional Specifications

2.2.1 Display

		GP-2401 Series GP-2501 Series		GP-2601 Series		
Туре		TFT type color LCD	GP-2501L Monochrome LCD GP-2501S STN type color LCD GP-2501T TFT type color LCD	TFT type color LCD		
Colors		256 / No blink* ¹ , 64 colors / 3-speed blink (Color switching is done via software)	GP-2501L Black and White, 2 levels of gray/ 8 levels of gray* (Color switching is done via software) GP-2501S GP-2501S 64 colors / 3-speed blink			
Resolution		640 x 480pixels		800 x 600pixels		
Effe	ctive Display Area	W149.8mm [5.90in.] x H112.3mm [4.42in.]	W211.2mm [8.34in.] x H158.4mm [6.24in.]	W246mm [9.69in.] x H184.5mm [7.26in.]		
Language Fonts		ASCII: (Code page 850) Alphanumeric (incl. Chinese: (GB2312-80 codes) simplified Japanese: ANK 158, Kanji : 6962 (JIS Sta Korean: (KSC5601 - 1992 codes) Ha T aiwanese: (Big 5 codes) traditional C		Eur. characters) Chinese fonts andards 1 & 2) angul fonts		
	8x8 dots		x 60 rows	100 Char. x 75 rows		
Text	8x16 dots		x 30 rows	100 Char. x 37 rows		
IOAL	16x16 dots		x 30 rows	50 Char. x 37 rows		
	32x32 dots		x 15 rows	25 Char. x 18 rows		
Font Sizes		Hight can be expanded 1 to 8 times. Width can be expanded $1/2^{*4}$, 1 to 8 times.				
Character Sizes *3		8X8 dot font, 8X16 dot font, 16X16 dot font and 32X32 dot font				
Backlight		CCFL (Service life: 50,000 hrs. at 25°C and 24hr. operation)				
Brightness Control Contrast Adjustment		4 levels of adjustment available via to 8 levels of adjustment available via touch panel.		uch panel.		
			(GP-2501L/S Only)	<u>/</u>		

Chapter 2 - Specifications

- *1 Changing the "Colors" setting to "256 colors" will disable the blink feature on all of your project's screens. If you wish to use the blink feature, do not change this setting to "256 colors".
- *2 In order to set the monochrome (eight levels of gray) mode, GP-PRO/PB III for Windows Ver. 6.2 or later is required. Depending on the color used, selecting MONOCHROME 8 HUES may cause the GP unit's screen to flicker and make it difficult to distinguish colors. Confirm that all colors display as expected prior to using this mode.
- *3 The display font will differ depending on which (language) character set used, or which size you select.

▼Reference Chapter 6.8 SET UP SCREEN

*4 Only available when using "Half-2 Byte Character" settings via software. (Only Chinese, Taiwanese, and Korean OS)

2.2.2 Memory

	GP-2401/GP-2501 Series	GP-2601 Series	
	2MB FLASH FPROM	4MB FLASH EPROM	
Application	[Approx. 640 screens at 3.2KB/screen]	[Approx. 1280 screens	
	[Approx. 040 screens at 3.2Nd/screen]	at 3.2KB/screen]	
Data Backup	128KB SRAM [uses a lithium battery] *1		

^{*1} A Lithium battery's lifetime is:

10 years when the battery's ambient temperature is 40 °C or less.

4.1 years when the battery's ambient temperature is 50 °C or less.

1.5 years when the battery's ambient temperature is 60 °C or less.

When used for backup:

Approximately 60 days, with a fully charged battery

Approximately 6 days, with a half-charged battery

2.2.3 Touch Panel • Clock

	GP-2401/GP-2501 Series	GP-2601 Series	
		40 x 30 keys	
Touch Panel	32 x 24 keys/screen	/screen	
Resolution	1 or 2 point push - selectable	1 or 2 point push-	
		selectable	
Clock Accuracy	+/- 65 seconds/ month (at room temperature)		



The GP's internal clock has a slight error. At normal operating temperatures and conditions, with the GP 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.

Chapter 2 - Specifications

2.2.4 Interfaces

Asynchronous Transmission : RS-232C/R-S422, Data Length: 7 or 8 bi Serial Interface Stop Bit: 1 or 2 bits, Parity: None, Odd or Even, Data Transmission Special Spec	
'	
2,400bps to 115.2kbps	
Asynchronous TTL level nonprocedural command I/F	
<during development="" file="" screen=""></during>	
Tool Connector Used for transferring data to and from the GP application software and	the
GP. Used for data transfer with the 2-Port feature.	
<during operation=""></during>	
Used for a variety of devices, including a bar-code reader.	
CF Card Interface 1 slot	
Compatible with NECPC-PR201/PL , EPSON ESC/P24-J84(C),	
Printer Interface HP Laser Jet PCL 4 command, EPSON PM/Stylus (6-color ink), EPSOI	V
Stylus (4-color ink) compatible printers ¹	
Remote Reset Input : 1 point	
Input Voltage : DC24V +/- 10%	
Input Current : 4mA (TYP)	
Min. Input Pulse Width: 2ms	
Operating Voltage : (When ON) Min. DC21.1V	
(When OFF) Max. DC3V	
AUX Input/Output*2 Isolation Method : Photocoupler Isolation	
Output - 3 Points (RUN Output - 1 point, System Alarm Output - 1 poi	nt,
External Buzzer Output - 1 point)	
Rated Voltage : DC24V	
Rated Current : 50mA/point	
Wire Gauge: AWG28 to AWG16	

^{*1} Printers with only Windows drivers cannot be used. However, certain types of printers with both Windows and DOS drivers can be used. For details, contact your local GP distributor.

^{*2} Using the AUX Input/Output I/F requires the separately sold Screw Lock Terminal Block.

2.3 Interface Specifications

2.3.1 Serial Interfaces

This interface can be either RS-232C or RS-422. Connects GP to Host (PLC). This interface uses a socket-type connector.

Pin Assignments		Pin#	Signal Name	Condition
(D-Sub 25pin female)		1	FG	Frame ground
		2	SD	Send data (RS-232C)
,	,	3	RD	Receive data (RS-232C)
	SIO	4	RS	Request send (RS-232C)
		5	CS	Clear send (RS-232C)
		6	DR	Data Set Ready (RS-232C)
1 1		7	SG	Signal ground
		8	CD	Carrier detect (RS-232C)
		9	TRMX	Termination (RS-422)
	0 0 14	10	RDA	Receive data A (RS-422)
	0 0	11	SDA	Send data A (RS-422)
		12	NC	No connection (Reserved)
0		13	NC	No connection (Reserved)
	$\parallel \circ \land \parallel \parallel \parallel$	14	VCC	5V±5% output 0.25A
		15	SDB	Send data B (RS-422)
	0 0 25	16	RDB	Receive data B (RS-422)
		17	RI	Ring Indicate (RS-232C)
		18	CSB	Clear send B (RS-422)
13		19	ERB	Enable receive B (RS-422)
	$\langle O \rangle$	20	ER	Enable receive (RS-232C)
		21	CSA	Clear send A (RS-422)
		22	ERA	Enable receive A (RS-422)
		23	NC	No connection (Reserved)
		24	NC	No connection (Reserved)
		25	NC	No connection (Reserved)

Recommended Connector: Dsub25pin plug XM2A-2501<made by OMRON>
Recommended Cover: Dsub25pin cover XM2S-2511<made by OMRON>
Jack Screws: XM2Z-0071<made by OMRON>



• Use rough metric type M2.6x0.45 threads used to secure the cable's set screws.

Recommended Cable: CO-MA-VV-SB5PX 28AWG <made by HITACHI Cable Ltd.>

To confirm your PLC's connection specifications, refer to

▼ Reference ▲ GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen creation software)

Chapter 2 - Specifications

When creating your own cable, follow the instructions listed below: <With RS-422>



The following pairs of pin numbers must be connected to each other.

- When connecting the RS-422 cable and the #9 (TRMX) and #10 (RDA) points, a termination resistance of 100Ω is added between RDA and RDB.
- When making a cable for a Memory Link system, be sure to use a 4-wire type.

<With RS-232C>

- Do not use the following pins: 9 (TRMX), 10 (RDA), 11 (SDA), 15 (SDB), 16 (RDB), 18 (CSB), 19 (ERB), 21 (CSA), 22 (ERA).
- The #1 (FG) terminal should only be connected if it is required by the device being connected to.



- This unit's serial port is not isolated, therefore, it is important that you connect the SG (Signal Ground) terminals. If this is not done, the RS422 circuit may be damaged.
- Pin 14 (VCC) DC5V output is not protected. To prevent damage or unit malfunction, be sure to use only the designated level of current.

2.3.2 Printer Interface

When connecting a printer, use Digital's printer cable (PSM-PRCB00).

Pin Assignments		Pin#	Signal Name	Condition	
			1	GND	Ground
			2	RESERVE	Reserved
			3	PDB5	Data Signal
		`	4	PDB4	Data Signal
			5	PDB3	Data Signal
			6	GND	Ground
			7	SLCT	Select Status (Input)
1		11	8	PDB0	Data Signal
			9	PSTB	Strobe Signal (Output) *1
			10	BUSY	Busy Signal (Input)
			11	PDB7	Data Signal
			12	PDB6	Data Signal
		20	13	GND	Ground
10			14	ERROR	Printer Error (Input) *1
			15	GND	Ground
			16	PDB2	Data Signal
		J	17	PDB1	Data Signal
			18	PE	Paper Runout ^{*1}
			19	INIT	Initialization Signal (Output)
			20	GND	Ground

^{*1} Not available with GP software.

AUX Input/Output I/F 2.3.3

This interface is used for external reset, alarm output and buzzer output.

Pin Assingments	Pin#	Signal Name	Condition
	1	AUXCOM	External Reset Common
	2	AUXRESET	External Reset Input
1	3	RUN	ONLINE Operation
	4	ALARM	System Alarm Output
	5	OUTCP	DC24V
	6	BUZZ	External Buzzer Output
	7	RESERVE	Reserved
	8	OUTCN	0V
	9	RESERVE	Reserved
12	10	RESERVE	Reserved
	11	RESERVE	Reserved
	12	RESERVE	Reserved

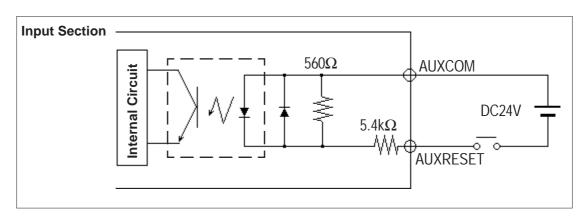
Note: Using the AUX Input/Output I/F requires the separately sold Screw Lock Terminal Block.

Torque: 0.2 to 0.4N•m

Wire Gauge: AWG16 to AWG 28

Removed Wire Length: 7 +/- 0.5mm [0.28 +/- 0.02 in.]

■ Input Circuit



Input Voltage DC24V +/- 10% **Input Current** 4mA/DC24V (TYP)

Min. Input Pulse Width 2ms

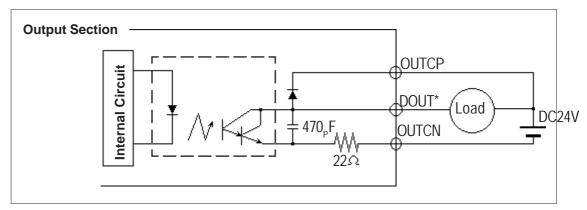
Operating Voltage ON Voltage min. DC21.2V

> OFF Voltage max. DC 3V

Termination Type Photo-Coupler Isolation

Chapter 2 - Specifications

■ OutputCircuit



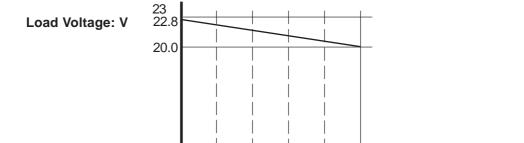
* DOUT is used for RUN, ALARM, and BUZZ.

Load Current: mA

Max. Load Current 50mA/point
Rated Load Voltage DC24V (TYP)

0

The following chart illustrates the relationship between the Load Voltage and the Load Current:



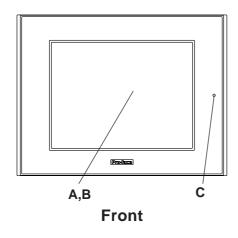
20

10

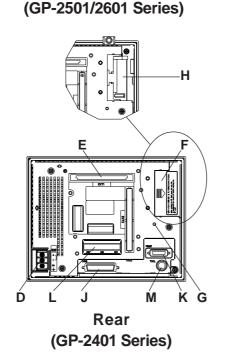
30

40

2.4 Part Names and Functions



E D F G Rear



A: Display Panel

The GP monitor screen displays the screen setup and corresponding host (PLC) data.

GP-2401T	TFT type color LCD
GP-2501T	TFT type color LCD
GP-2501S	STN type color LCD
GP-2501L	Monochrome LCD
GP-2601T	TFT type color LCD

B: Touch Panel

Performs any screen change operations and sends data to the PLC.

C: Status LED

This LED reflects the GP's condition.

Color	Indicates	
OFF	No power input	
Green	Normal operation	
Orange	Backlight is burned out	
Orange	or GP malfunction ^{*1}	

^{*1} Please see "8.3 Replacing the Backlight" for the details.

D: Power Input Terminal Block

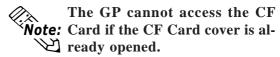
Connects the power cord.

E: Expansion Unit Interface (EXT1)

Connects expansion units with communication features.

F: CF Card Cover

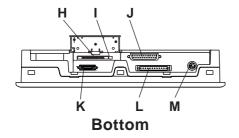
Open this cover to the CF Card Slot. When accessing the CF Card, this cover must be closed.



G: CF Card Access Lamp

If the CF Card Cover is closed when the CF Card is inserted, the LED lamp turns ON. The LED lamp will remain turned ON even if the CF Card Cover is opened while the GP accesses the CF Card.

Chapter 2 - Specifications



H: CF Card Slot

Insert a CF Card in this slot.

I: Dip Switches



Dip Switch	Function	ON	OFF	Note
1	This Dip switch	Startup from	Startup from	CF Card with
	setting controls	CF Card is	CF Card is	startup data
	the startup from a	enabled.	disabled.	required.
	CF Card.			
2	Reserved			Keep these
3	Reserved			switches OFF
4	This setting	Forced close	Forced close	Used when CF
	controls the forced	enabled.	disabled.	Card cover is
	closing of the CF			damaged.
	Card cover.			

J: Serial Interface (COM1)

Connect the RS-232C and RS-422 cables here. Connect the other end to the Host (PLC.)

K:Printer Interface (PRINT)

Connect the printer cable here. Recommended cable: Digital Electronics Corporation PSM-PRCB00 Cable.

L: Auxiliary Input/Output Interface (AUX Reset)

Used for external reset, alarm output, buzzer output. Using this interface requires the separately sold Screw Lock Terminal Block.

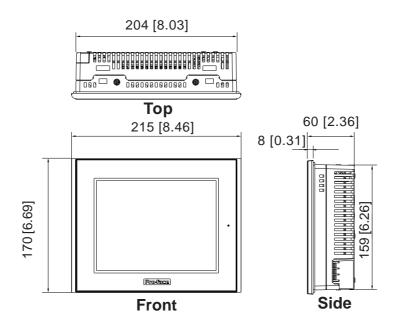
M:Tool Connector (TOOL)

The Data Transfer cable or Bar Code Reader can be connected here.

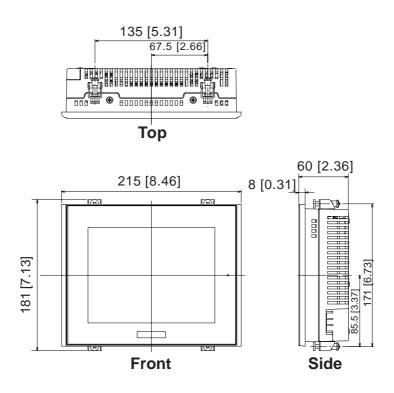
2.5 Dimensions

2.5.1 GP-2401 Series External Dimensions

Unit: mm [in.]

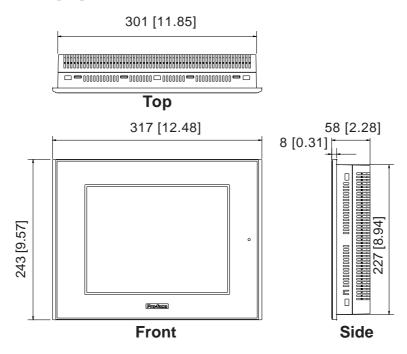


The following drawing shows the GP-2401 Series unit with installation fasteners.

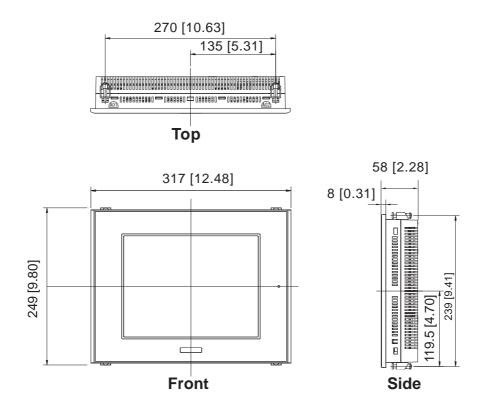


2.5.2 GP-2501 Series External Dimensions

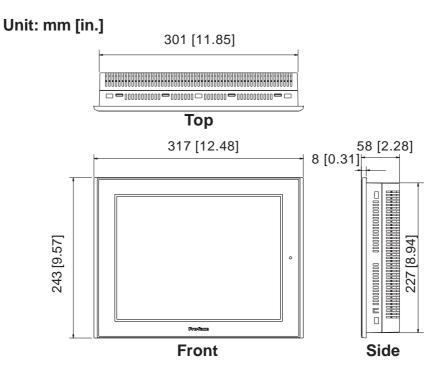
Unit: mm [in.]



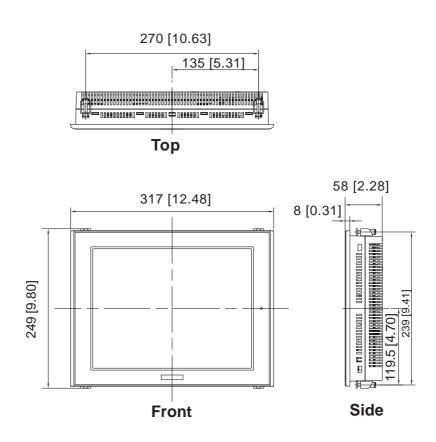
The following drawing shows the GP-2501 Series unit with installation fasteners.



2.5.3 GP-2601 Series External Dimensions



The following drawing shows the GP-2601 Series unit with installation fasteners.



2.5.4 Panel Cut Dimensions

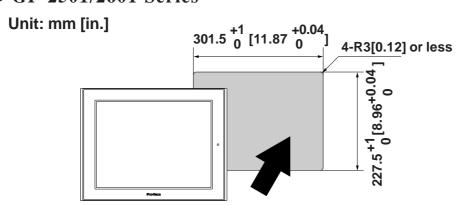
■ GP-2401 Series

Unit: mm [in.]

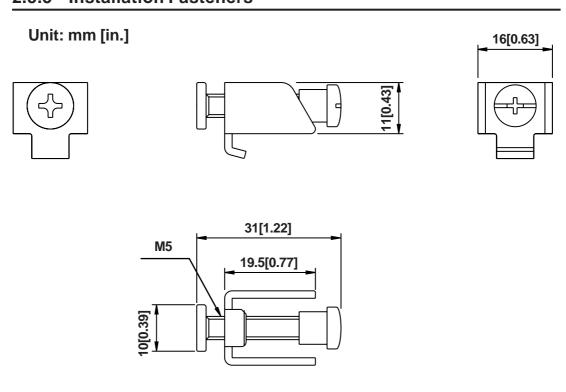
204.5 ⁺¹₀ [8.05 ^{+0.04}₀]

4-R3[0.12] or less

■ GP-2501/2601 Series



2.5.5 Installation Fasteners



Chapter

- 1. Installation
- 2. Wiring Precautions
- 3. Tool Connector

3 Installation and Wiring

3.1 Installation

3.1.1 Installation Procedures

Follow the steps given below when installing the GP.

■ Check the Installation Gasket's Seating

It is strongly recommended that you use the installation gasket, since it absorbs vibration in addition to repelling water.

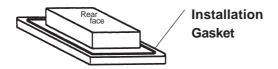
Place the GP on a level surface with the display panel facing downward. Check that the GP's installation gasket is seated securely into the gasket's groove, which runs around the perimeter of the panel's frame.

For details about installing the gasket, refer to

Reference 8.1.2 Installation Gasket Check/Replacement



- Before installing the GP into a cabinet or panel, check that the Installation gasket is securely attached to the unit.
- A gasket which has been used for a long period of time may have scratches or dirt on it, and could have lost much of its dust and drip resistance. Be sure to change the gasket periodically, or when scratches or dirt become visible.
- Be sure to use gasket model PS400-WP00-MS (GP-2401 Series)/ GP570-WP10-MS (GP-2501/2601 Series).
- Be sure the gasket's seam is not inserted into any of the unit's corners, only in the straight sections of the groove. Inserting it into a corner may lead to its eventually tearing.

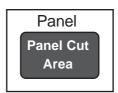


■ Creating a Panel Cut

Create the correct sized opening required to install the GP, using the installation dimensions given.

▼Reference 2.5.4 GP Panel Cut Dimensions

The installation gasket, installation brackets and attachment screws are all required when installing the GP.

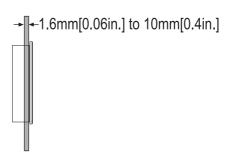




Check that the installation panel or cabinet's surface is flat, in good condition and has no jagged edges. Also, if desired, metal reinforcing strips can be attached to the inside of the panel, near the Panel Cut, to increase the panel's strength.

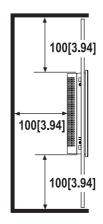


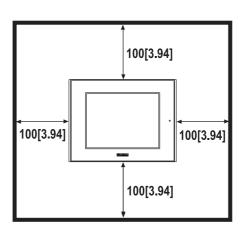
Panel thickness should be from 1.6mm [0.06in.] to 10mm [0.4in.]. Decide important the panel's thickness based on the level of panel strength required.





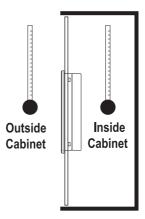
For easier maintenance, operation, and improved ventilation, be sure to install the GP at least 100 mm [3.94 in.] away from adjacent structures and other equipment.



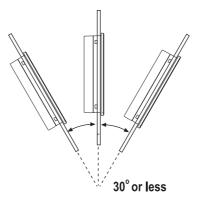




Be sure that the ambient operation temperature and the ambient humidity are within their designated ranges. (When installing the GP in a cabinet or enclosure, the term "ambient operation temperature" indicates the cabinet or enclosure's internal temperature.



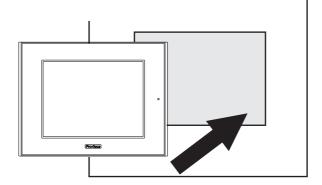
- Be sure that heat from surrounding equipment does not cause the GP to exceed its standard operating temperature.
- When installing the GP in a slanted panel, the panel face should not incline more than 30°.



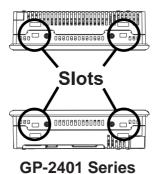


- When installing the GP in a slanted panel, and the panel face inclines more than 30°, the ambient temperature must not exceed 40 °C. You may need to use forced air cooling (fan, A/C) to ensure the ambient operating temperature is 40 °C or below.
- When installing the GP vertically, position the unit so that the Power Input Terminal Block is also vertical.

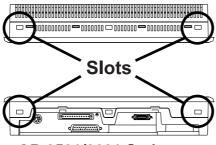
■ Installing the GP



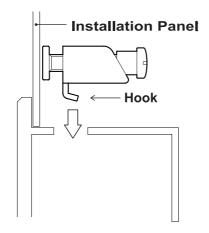
1) Insert the GP into the panel cut out, as shown here.

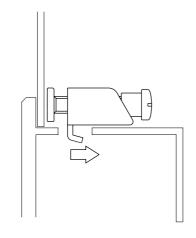


2) Insert the installation fasteners into the GP's insertion slots, at the top and bottom of the unit. (total: 4 slots)

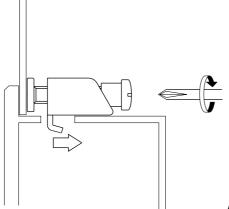


GP-2501/2601 Series





3) Insert each of the fasteners shown below. Be sure to pull the fastener back until it is flush with the rear of the attachment hole.



4) Use a Phillips screwdriver to tighten each fastener screw and secure the GP in place.



A torque of only 0.5 Nom is sufficient to tighten these screws. Do not use too much force, since it may damage the GP unit.



Note: Depending on the installation panel's thickness, etc., the number of installation fasteners used on a GP-2501 Series or GP-2601 Series can be increased to provide a higher level of moisture resistance. (The GP-2401T is limited to four (4)).

3.2 Wiring Precautions

3.2.1 Connecting the Power Cord

⚠ WARNINGS

- To avoid an electric shock, be sure the power cord is unplugged from the power outlet when connecting the power terminals to the GP unit.
- GP2401-TC41-24V, GP2501-TC41-24V, GP2501-SC41-24V, GP2501-LG41-24V, and GP2601-TC41-24V are designed to use only DC24V power. Using any other level of power can damage both the power supply and the GP unit.
- For models GP2501-TC11, GP2501-SC11 and GP2600-TC11, all products not marked Revision "3" are designed to use only AC100V power. Using any other level of power can damage both the power supply and the GP unit.
- Since the GP is not equipped with the power switch, be sure to connect a breaker type power switch to the GP's power cord.
- Be sure to ground the GP's FG terminal. Failure to do so can lead to an electrical shock or GP malfunction.



- When the FG terminal is connected, be sure the wire is grounded. Not grounding the GP unit will result in excessive noise. Use your country's applicable standard for grounding.
- To prevent the Ring Terminals from causing a short when the terminal block attachment screws are loosened, be sure to use sleeve-type Ring Terminals. \(\subseteq Reference \times \) 3.2.3 Grounding
- The SG and FG terminals are connected internally in the GP unit.
- When connecting the SG line to another device, be sure that the design of the system/connection does not produce a shorting loop in your system.

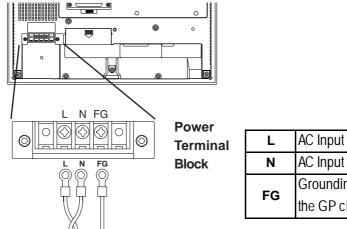


- Wherever possible, use thick wires (max 2mm²) for power terminals, and twist the exposed wire ends when connecting the Ring Terminals.
- Please use the following size crimp-on type Ring Terminals.

Over ϕ 3.2mm[0.13in.] Under 6.0mm[0.24in.]

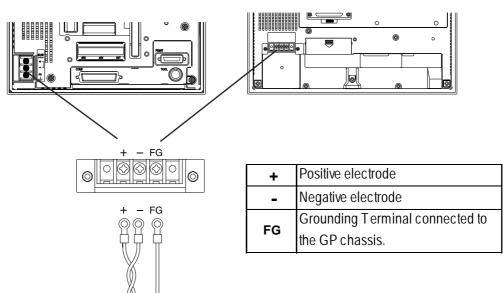
■ Connecting the Power Supply Terminals

♦ GP2501-TC11, GP2501-SC11, GP2601-TC11



L	AC Input Live Line		
	AC Input Neutral Line		
FG	Grounding Terminal connected to		
FG	the GP chassis.		

◆GP2401-TC41-24V/GP2501-TC41-24V/GP2501-SC41-24V/GP2501-LG41-24V/GP2601-TC41-24V

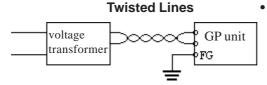


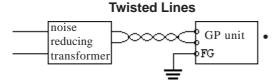
- 1) Be sure that the GP's power cord is not plugged in to the power supply.
- 2) Remove the Terminal Strip's clear plastic cover.
- 3) Remove the screws from the three (3) middle terminals, position the Ring Terminals as shown above and reattach the screws. (Check each wire to make sure the connections are correct)
- 4) Reattach the Terminal Strip's clear plastic cover.

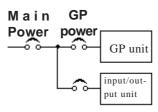


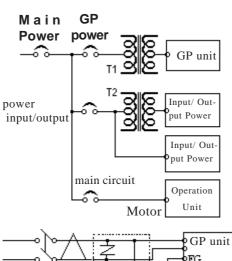
A torque of only 0.5 to 0.6 Nom is required to tighten an attachment screw.

3.2.2 Connecting the Power Supply











If the supplied voltage exceeds the GP unit's range, connect a voltage transformer.

Reference Chapter 2 Specifications for the allowable voltage range.

For between the line and ground, select a power supply that is low in noise. If there is an excess amount of noise, connect a noise reducing transformer.

Use Voltage and Noise Reducing transformers with capacities exceeding 100VA.

- When supplying power to the GP unit, please separate the input/output and operation unit lines, as shown.
- To increase the noise resistance quality of the power cable, simply twist each power wire before attaching the Ring Terminal.
- The power supply cable must not be bundled or positioned close to main circuit lines (high voltage, high current), or input/output signal lines.
- Connect a lightning surge absorber, as shown in the diagram, to deal with power surges.
- To avoid excess noise, make the power cable as short as possible.



lightening

E2

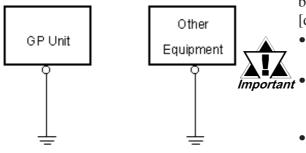
- Be sure to ground the surge absorber (E1) separately from the GP unit (E2).
- Select a surge absorber that has a maximum circuit voltage greater than that of the peak voltage of the power supply.

3.2.3 Grounding

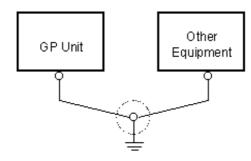
ACAUTION

Do not use common grounding, since it can lead to an accident or machine breakdown.

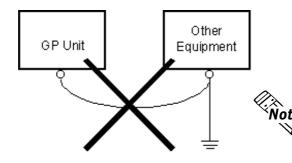
(a) Exclusive Grounding (BEST) *1



(b) Common Grounding (OK)*1



(c) Common Grounding (Not OK)



Connect the FG terminal found at the back of the GP to an exclusive ground. [diagram (a)].

- Check that the grounding resistance is less than 100Ω .
- The SG and FG terminals are connected internally in the GP unit.
- When connecting the SG line to another device, be sure that the design of the system/ connection does not produce a shorting loop.
- The grounding wire should have a cross sectional area greater than 2mm². Create the connection point as close to the GP unit as possible, and make the wire as short, as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.

If exclusive grounding is not possible, use a common connection point. [diagram (b)]

Vote: properly when grounded, disconnect the ground wire from the FG terminal.

3.2.4 I/O Signal Line Placement

- Input and output signal lines must be separated from the power control cables for operating circuits.
- If this is not possible, use a shielded cable and connect the shield to the GP's frame.

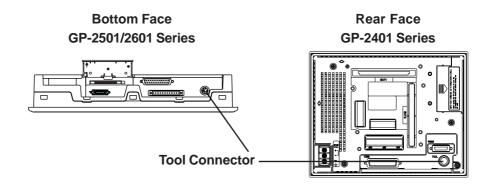
^{*1} Use a grounding resistance of less than 100Ω and a 2mm² or greater thickness wire, or your country's applicable standard. For details, contact your local GP distributor.

3.3 Tool Connector

The GP's Data Transfer Cable, Memory Loader, or the Bar Code Reader can be attached to the GP unit's Tool Connector.

⚠ WARNING

To prevent an electric shock, unplug the GP unit's power cord from the main power supply prior to attaching or detaching any connector(s) to or from the GP.





When the Bar Code Reader uses a separate power supply:

- Turn the Bar Code Reader ON before turning the GP ON.
- Turn the GP OFF before turning the Bar Code Reader OFF.

3.4 CF Card Installation and Removal

CAUTIONS

When using the GP Unit and a CF Card, follow the precautions below:

- Prior to inserting or removing a CF Card, be sure to turn the GP unit's CF Card ACCESS switch OFF and to confirm that the ACCESS lamp is not lit. If you do not, CF Card internal data may be damaged or lost.
- While a CF Card is being accessed, NEVER turn OFF or reset the GP, or 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.

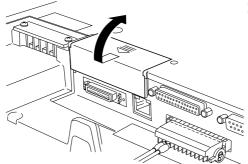
Reference Refer to GP-PRO/PB III for Windows Tag Reference Manual (included in the screen editor software package)

- Prior to inserting a CF Card, familiarize yourself with the CF Card's front and rear face orientation, as well as the CF Card connector's position. If the CF Card is not correctly positioned when it is inserted into the Mulit Unit, the CF Card's internal data and the GP unit may be damaged or broken.
- Be sure to use only CF Cards manufactured by the Digital Electronics Corporation. GP unit performance cannot be guaranteed when using another manufacturer's CF Card.
- Once GP data is lost, it 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 occuring:
- DO NOT bend the CF Card.
- DO NOT drop or strike the CF Card against another object.
- Keep the CF Card dry.
- DO NOT touch the CF Card connectors.
- DO NOT disassemble or modify the CF Card.

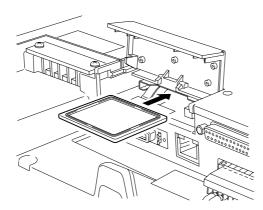
■ Inserting the CF Card

Use the following steps to insert the CF Card in the GP.

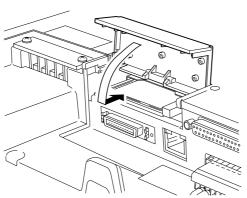
(The illustrations below show the procedures for the GP-2501/2601 Series models. However, these procedures are also the same for the GP-2401 Series.)



1) Slide the CF Card Cover in the direction shown here, then upwards to open the cover.



2) Insert the CF Card in the CF Card Slot, until the ejector button is pushed forward.



- 3) Close the cover. (As shown.)
- 4) Confirm that the CF Card Access LED turns ON.



The GP cannot access the CF Card if the CF Card cover is already opened. If however, the CF Card Cover is opened while the GP is accessing the CF Card, access will not be interrupted.

■ Removing the CF Card

Simply reverse the steps shown in the previous "Inserting CF Card" explanation. Prior to removing the CF Card, confirm that the CF Card Access LED is turned OFF.

3.4.1 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)

Two methods are available for backing up data. After using either method 1) or method 2), use your PC to save your data to the CF Card.

(1) If your PC is equipped with a PC Card Slot

To view CF Card data on a personal computer, first, insert the CF Card into a CF Card Adapter.

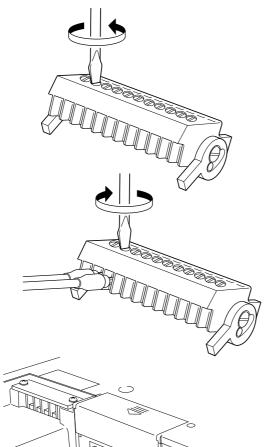
(2) If your PC is NOT equipped with a PC Card slot

Use a commercially available PC Card Reader, or a CF Card Reader.

3.5 Attaching the Screw Lock Terminal Block

Using the AUX Input/Output I/F requires the separately sold Screw Lock Terminal Block. Use the procedures shown below to attach the Screw Lock Terminal Block to your GP unit's AUX I/O I/F.

(The illustrations below show the procedures for the GP-2501/2601 Series models. However, these procedures are also the same for the GP-2401 Series.)

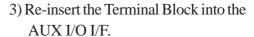


1) Loosen the set screws of each desired Screw Lock Terminal Block pin.

2) Insert each wire end into its pin and tighten the set screw.

Wire Gauge: AWG 16 to AWG 28 Removed Wire Length: 7 +/- 0.5mm

[0.28 +/-0.02 in.] Torque: 0.2 to 0.4 N•m



4) Raise both of the Terminal Block's right and left side clamp levers to secure the Terminal Block to the AUX I/O I/F.

Chapter

- 1. Serial Data Transfer
- 2. Ethernet Data Transfer
- 3. CF Memory Loader Tool

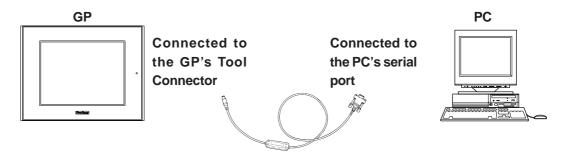
4 Data Transfer

This chapter explains following three (3) methods of transferring data created with the GP screen creation software to or from the GP.

- Transfer data via the data transfer cable to or from your GP.
- Transfer data via an Ethernet network to the GP (Ethernet Unit is required).
- Transfer data via the CF Card to or from your GP using the CF Memory Loader Tool.

4.1 Serial Data Transfer

The following explains how to connect Pro-face's data transfer cable to your PC and to the GP.





- Pro-face's transfer cable (GPW-CB02) is sold separately. The transfer cable package does not include the PC's interface converting adapter.
- When using the PC with the Dsub 25pin socket side interface, a connector conversion adapter is required. Use the straight line type conversion adapter.

Recommended units:

Abel Co. AA833

Sanwa Supply Co. D09-9F25F

• When using a PC equipped with a half-pitch 14pin socket interface, a conversion adapter is required.

Recommended unit:

Arroz Co. ZR01-024

Chapter 4 - Transfer Screen Data

Transfer screen data from your PC, via the GP screen creation software.

Reference For details about the GP screen creation software, refer to GP-PRO/PBIII for Windows Operation Manual (included in the GP screen editor software)

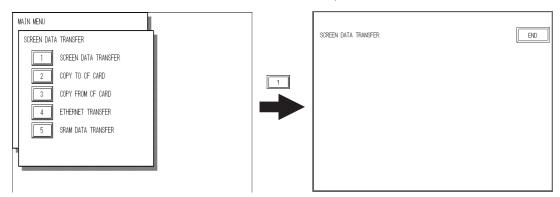
■ To Transfer Data to a Completely New GP

Connect the GP to your PC via the data transfer cable, and then turn the GP ON. The "Initial Start Mode" screen will appear on the GP and you can transfer screen from your PC. The screen will change to the "Transfer" screen automatically.



■ After Completing Data Transfer using GP setup*1

Transfer screen data from the GP screen creation software, and select the "Transfer" mode.



During data transfer, the "SETUP Transfer" and "Now Transferring - Please Wait" messages will appear. When these messages disappear, screen data transfer is completed.

If you wish to stop data transfer, simply cancel it from your PC's GP screen creation software.

If you try to set up the GP after data transfer, the OFFLINE mode's "Main Menu" will appear. If you do NOT set up the GP, the screen designated in "INITIAL SETTINGS/ SCREEN SETUP/INITIAL SCREEN FILE NO." will appear and the screen will change to operation (RUN) mode.

^{1*} Here, the term "Set up" refers to the process of sending GP screen, system program and protocol program information to the GP via the screen creation software, so that the GP can be used as an operator interface.

Chapter 4 - Transfer Screen Data



Do NOT disconnect the GP's power supply, turn OFF the PC, or disconnect the GP's transfer cable during the data transfer. If you do, an error may occur when the GP is started.



If the GP screen creation software's "GP SYSTEM SETTINGS" data is trans-Note: ferred to the GP, the OFFLINE mode "INITIAL SETTINGS" data will be overwritten.

4.2 Ethernet Data Transfer

For the GP-2501/2601 Series, the Ethernet I/F allows you to set up the GP via an Ethernet network, as well as transfer GP screen data. To use this feature, the optional Bus Conversion unit and Ethernet unit (GP Ethernet I/F unit or Multi Unit) are required.

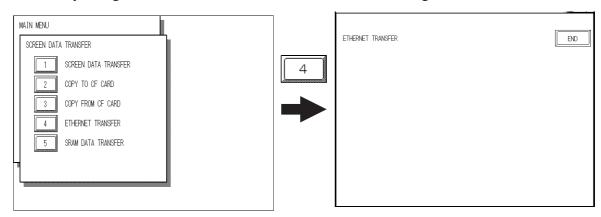


- When using the Ethernet communication protocol, you must specify the port number for the protocol as +10 or higher than the value specified in this section. Otherwise, the setup or screen data transfer via Ethernet is disabled.
- The GP-2401/2501/2601 Series cannot receive screen data, and cannot be set up via the, "GP2000 Initial Start Mode Screen", even though the optional Ethernet expansion unit is attached. Use the GP unit's optional Data Transfer cable to set up the GP. Once the GP Setup is finished, Ethernet data transfer becomes possible. When using the Ethernet network to transfer data from your PC, be sure to also send the 2-Way Driver → data to the GP.

After you connect an Ethernet cable to the Ethernet unit, the GP will appear on the Ethernet network.

Set an IP address in the OFFLINE mode "INITIAL SETTING / OPERATING ENVIRONMENT SETTING / EXTENSION SETTING / ETHERNET INFORMATION SETTING". However, in case that an IP address is preset in the PC's screen editor software, the IP address is set in the GP. If the transferred IP address is used, setting the GP's IP address again in the OFFLINE mode is not needed.

When you transfer screen data from your PC to the GP while the GP is in RUN mode, the screen will change automatically to "Ethernet Mode". If it does not, you will need to manually change the GP screen to Ethernet Mode, via the following screen.



You can now transfer data from your PC's screen editor software.

▼Reference GP-PRO/PBIII for Windows Operation Manual

^{*1} Both the 2Way driver protocol and another Ethernet protocol (Mitsubishi Ethernet or Toshiba Ethernet) installed in the GP-2401/2501/2601 Series unit cannot be used simultaneously on an Ethernet network. MemoryLink Ethernet, however, can be used to transfer screen data only via the Ethernet network.

4.3 CF Memory Loader Tool

The GP2000 allows you to use the CF Memory Loader Tool in the CF Card to set up the GP, transfer screen data, and upload GP internal data to its internal CF Card.



• You need to transfer the CF Memory Loader Tool to the CF Card prior to using the CF Memory Loader Tool.

▼ Reference ▲ GP-PRO/PBIII for Windows Operation Manual

• The CF Memory Loader Tool and Backup Data require more than 7MB of CF Card memory. When using Digital's CF Card "GP077-CF10 (8MB)", if the combination of this data and your GP's filing data and image data collectively require more than 8MB, the memory space of the CF Card will run out.

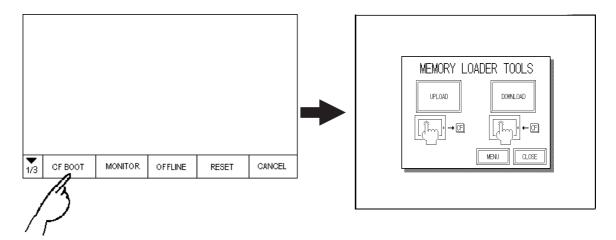
■ Starting the CF Memory Loader Tool

There are two methods for starting this program via the CF Card.

1. Menu Bar: Using the GP's [CF BOOT] menu

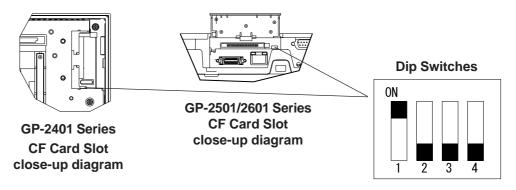
Insert the CF Card with the CF Memory Loader Tool saved into the GP and touch the menu screen's [CF BOOT] selection. The GP will be reset, and after it restarts, the CF card's "CF Memory Loader Tool" will start.

Reference For how to display the Menu bar, refer to **6.4.3 ETHERNET SETUP**



2. GP Dip Switches: Forced Start via GP Dip Switches

You can also use the Dip Switches on the rear of the GP, next to the CF Card Slot. If you turn ON Dip Switch No.1 (raise it) and then connect the GP unit's power cord, the "CF Memory Loader Tool" will automatically start.

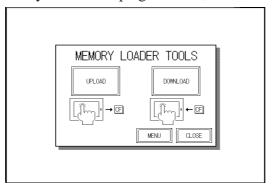




When you finish using the CF Memory Loader Tool, turn OFF this dip switch.

Data Upload and Download 4.3.1

When the Memory Loader Tool program starts, the following screen will appear.

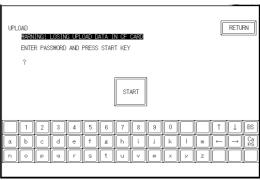


■ UPLOAD (From GP to CF Card)

This feature is for saving all GP internal data (i.e. system program, communication protocol, expansion program, screen data and Backup SRAM data) in the CF Card as backup data. To start data upload, enter the password you designated in the GP screen creation software's "Transfer" screen, and then touch the "START" key. If you have not designated a password however, simply touch the "START" key.



When UPLOAD is performed, the CF Card's current Backup Data will be completely overwritten.

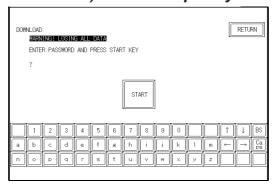


■ DOWNLOAD (From CF Card to GP)

This feature is used for writing CF Card backup data to the GP's Internal SRAM Memory. To start data download, enter the password you designated in the GP screen creation software's "Transfer" screen, and touch the "START" key. If you have not designated a password, simply touch the "START" key.



When DOWNLOAD is performed, the GP's Internal Memory data (i.e. system program, communication protocol, expansion program, screen data Important and Backup SRAM data) will be completely overwritten.



Chapter

- 1. Entering OFFLINE Mode
- 2. OFFLINE Mode Main Menu
- 3. INITIALIZATION
- 4. SELF-DIAGNOSIS

5 OFFLINE Mode

OFFLINE Mode provides access to the Initialize, Self-Diagnosis, and other features built into the GP. Before you can use any of these features, however, you will need to change the GP to OFFLINE mode.



OFFLINE mode is unavailable in a completely new GP until the necessary GP system data has been transferred from your PC's screen editor software. To do this, be sure the GP's power cord is plugged in and when you transfer screen data from your PC to the GP, your GP's system data will be automatically sent.

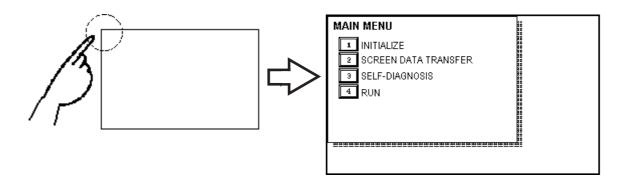
Reference For information about transferring data to the GP, refer to Chapter 4-Transfer, or the **GP-PRO/PBIII for Windows Operation Manual** (included in the screen creation software)

5.1 Entering OFFLINE Mode

To INITIALIZE your GP or perform SELF-DIAGNOSIS, you must first switch the GP to OFFLINE mode. There are two ways to enter OFFLINE mode. First, is immediately after plugging in the GP's power cord, and second, by using the Forced Reset feature.

5.1.1 After Plugging in the Power Cord

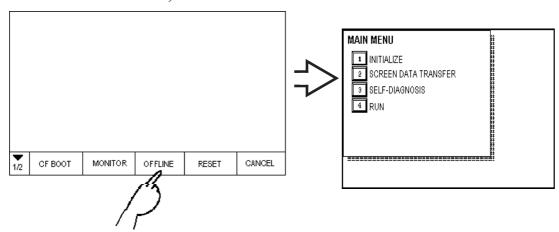
Touch the upper left-hand corner of the GP screen within 10 seconds of plugging in the GP's power cord and the GP will change to OFFLINE mode.



5.1.2 From the Menu Bar

From the GP unit's Menu Bar, touch the OFFLINE square and the OFFLINE mode Main Menu will appear.

▼ Reference ✓ For instructions on how to call up the Menu Bar, refer to 6.4.3 "SET UP TOUCH PANEL; FORCED RESET"





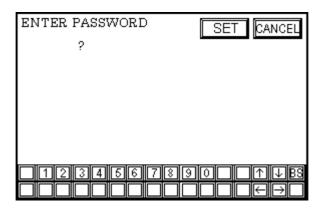
Note: If your GP unit has the Device Monitor feature, the "Monitor" square will also appear.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen creation software), Appendix 3 - Device Monitor

If a Password has been entered in the INITIALIZE/SET UP SYSTEM area, before entering the OFFLINE mode, the following screen appears.

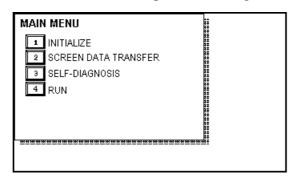
Here, enter the password, then touch *Set* to enter OFFLINE mode.

Reference For more information about Passwords, Chapter 6.3.1, "SYSTEM SETUP" and Chapter 5.3, "INITIALIZATION"



5.2 OFFLINE Mode Main Menu

Each menu item shown below has different settings that must be set to match the corresponding PLC in order for the GP to communicate properly. Entering OFFLINE mode calls up the following screen.



Select the desired menu item by touching the corresponding screen item bar.

Each Main Menu item is used as follows.

INITIALIZE

The setup items contained in this menu are used to control the GP unit.

SCREEN DATA TRANSFER

Select to transfer screen data to and from the screen editing software.

SELF-DIAGNOSIS

Checks to see if there are any problems with the GP System or Interface (I/F).

RUN

Starts GP operation.

▼ Reference **▲**

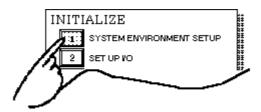
For more information about INITIALIZE, refer to Chapter 6.

For more information about TRANSFER SCREEN DATA, refer to **Chapter 4** or **GP-PRO/PBIII for Windows Operation Manual** (included with the screen creation software) For more information about SELF-DIAGNOSIS and RUN, refer to **Chapter 7**.

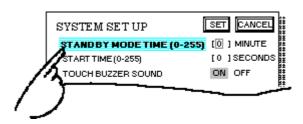
5.3 INITIALIZATION

■ Selecting A Menu

Touch the menu number to select it.

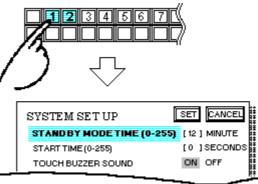


Touch the menu to select it.



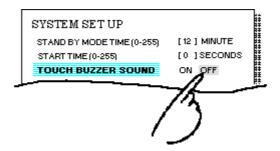
■ Entering Numbers

Touching a menu item or an enter field enables you to enter the numeric values. Use the numeric touch keys located at the bottom of the screen to enter numeric values.



■ Selecting Setup Conditions

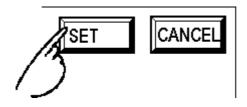
After selecting a menu item and entering that area, touch the option you would like to setup. The selected item becomes highlighted. In this example, the TOUCH BUZZER SOUND has been set to OFF.



■ After All Setting Data is Entered

Touch the top-left [SET] key.

If you wish to exit the screen without saving the changes, touch the [CANCEL] key.

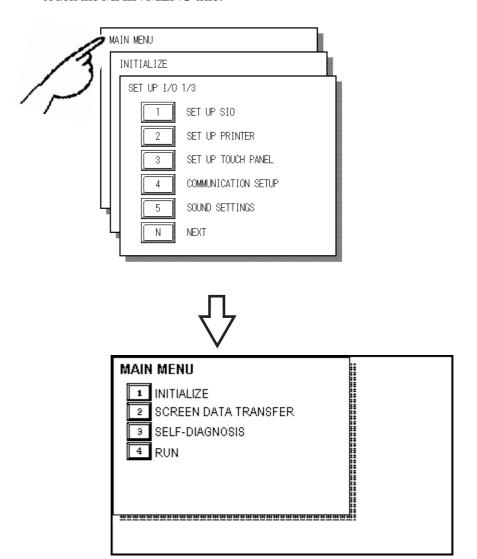


- Press the [SET] key to write the Setup conditions to the Internal FEPROM, which will require a short period of time. Until this processing is completed, do not touch the screen until the previous menu reappears.
- Press the [CANCEL] key to return to the previous menu, without writing the Setup conditions to the Internal FEPROM.

■ Return To Previous Screen

Touch the title of the screen you would like to return to.

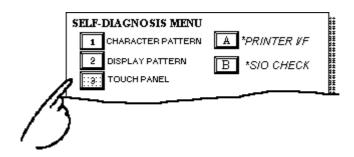
E.g. To return to the MAIN MENU from the SYS.ENVIRONMENT screen, simply touch the MAIN MENU title.



5.4 SELF-DIAGNOSIS

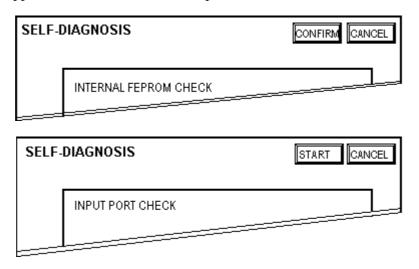
■ Selecting a Sub-Display

Touch the desired menu item and that sub-display will appear.



■ [CONFIRM], [START] and [CANCEL] Keys

After selecting the Self Diagnosis item, the [CONFIRM], [START], and [CANCEL] keys may appear at different times at the top of the screen.



[CONFIRM] Key

Touching this key informs the GP that you have completed all the necessary steps prior to running "Self Diagnosis". All these steps will be shown in the GP's message dialogs.

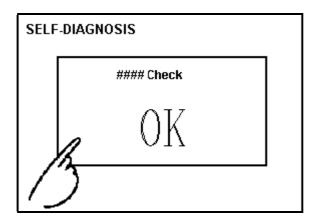
[START] Key

Touch this key to start the checking process.

[CANCEL] Key

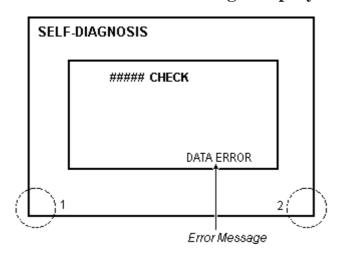
Press this key to cancel the Self-Diagnosis test. Control will then return to the SELF-DIAGNOSIS menu.

■ After Check - To Return To SELF-DIAGNOSIS MENU When OK displays,



Pressing once anywhere on the display screen returns you to the SELF-DIAGNOSIS MENU.

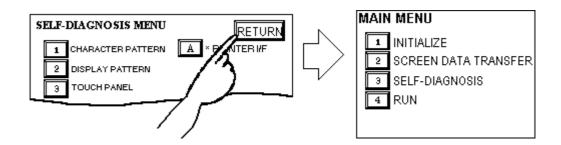
■ When an Error Message displays



Touch the bottom two corners of the panel (1, 2) to return to the SELF-DIAGNOSIS MENU.

■ Return To Main Menu

Touch the "RETURN" key to return to the main menu screen.



Memo



- 1. Initialization Screen
- 2. Initialization Items
- 3. SYSTEM ENVIRONMENT SETUP 8. SET UP SCREEN
- 4. SET UP I/O
- 5. PLC SETUP

6. INITIALIZE INTERNAL MEMORY

- 7. SET UP TIME

Initializing the GP

Initialization Screen 6.1

Occasionally, you may want to change your GP's general operation settings. The settings used for this are found in the INITIALIZE option in the GP OFFLINE mode's MAIN MENU.

This chapter explains each of the OFFLINE mode's INITIALIZE items. However, there are 2 types of INITIALIZE settings, those for the 1:1 connection and those for the **n:1** (multi-link) connection*1.

The **n:1** mark appears on original menu items related to n:1 multi-link connection items. If there is no mark, the menu item is common to both 1:1 and n:1 connections.

- **1:1** A single (1) GP is connected with a single (1) PLC.
- **n:1** Multiple GPs are connected with a single PLC. The GPs successively pass a PLC Access Token (exclusive PLC interaction key) among themselves to designate which unit can communicate with the PLC.

If you transfer the GP's system file data to the GP via your screen design software*2, the GP operates using that data. If the GP System file has been correctly setup and transferred, the setting of INITIALIZE items become unnecessary.

Reference For more information about GP System files

GP-PRO/PBIII for Windows Operation Manual (included with screen creation software)

^{*1} PLC's that support the n:1 (multi-link) connection are limited.

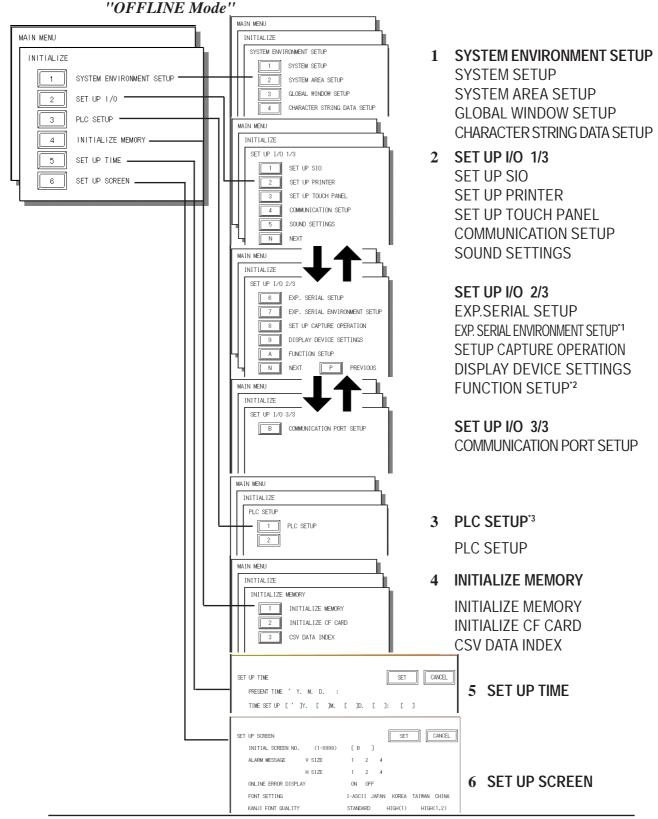
Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen creation software)

^{*2} Refer to GP screen creation software's "SYSTEM SETTINGS" area.

6.2 Initialization Items

This chapter explains the contents of the Initialize setup items listed below. For information about screen operations and numeric input.

Reference Chapter 5*,



^{*1} Since the GP-2401/2501/2601 Series units are not equipped with an Expansion I/F, this setting is disabled.

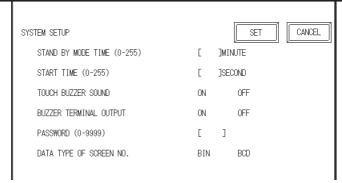
^{*2} Since the GP-2401/2501/2601 Series units are not equipped with a Function Key, this setting is disabled.

^{*3} Note that, depending on the Device/PLC type selected, the screens that appear in your GP's screen editor software will vary.

6.3 SYSTEM ENVIRONMENT SETUP

These settings allow you to adjust the GP's operation environment. SYSTEM ENVIRONMENT SETUP includes the SYSTEM SETUP, SYSTEM DATA AREA, GLOBAL WINDOW SETUP, and CHARACTER STRING DATA SETUP screens.

6.3.1 SYSTEM SETUP



STAND-BY MODE TIME (0-255)

To extend the life of the GP's backlight, the GP is equipped with a screen saver function that automatically turns the unit's backlight(s) OFF when no operations have occurred for a designated period of time. A "0" entered in this field causes a normal display, i.e. the screen is cleared after the GP's standard default time elapses.

When SYSTEM DATA AREA's (**Reference** GP-PRO/PBIII for Windows Device/PLC Connection Manual - included with the screen creation software) SCREEN DISPLAY OFF*1 data is 0000h, and the following operations are not performed on the screen for the User's designated period of time, the GP's current display is turned OFF.

- Change Screen
- Touch Screen
- Alarm Messages (scrolling display)
- Error Message(System Window) Display
- Menu Bar (for forced reset) display
- Japanese (FEP) System window

START TIME (0-255)

This setup determines the start-up time of the GP. Use this setup to adjust the power up sequence so that the GP starts up after the PLC.

TOUCH BUZZER SOUND

Setup whether or not the GP beeps when pressed.

BUZZER TERMINAL OUTPUT

Turns the GP AUX Input I/F BUZZ signal output ON or OFF. Used when connecting an external buzzer to the GP.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen creation software)

^{*1} When using the Direct Access or the Memory Link formats, the object address becomes +9 or +12, respectively. (Only when all items are set within the System Data Area.)

PASSWORD SETUP(0-9999)

The password setting is used when changing to the Initialize Memory or Initialize (OFFLINE mode) Screens. The password (*from 0 to 9999*) ensures protection of the GP settings, since the use of OFFLINE mode is controlled. If you do not wish to use this feature, enter the default value, **0**.

DATA TYPE OF SCREEN NO.

This setup controls whether BIN or BCD format numbers are used when making screen changes. Screen numbers 1 to 8999 are available for binary format; screen numbers 1 to 1999 are available for BCD format.

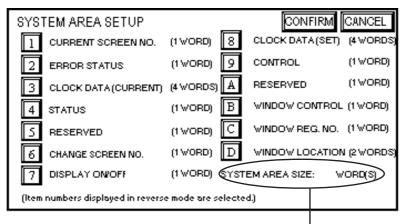
6.3.2 SYSTEM AREA SETUP

The System Data Area is used by the PLC to control its GP-related data, and is contained in the PLC. The types of devices that can be set up in the System Data Area differ depending on the PLC type.

When the GP uses Memory Link format, this setting is unnecessary.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with the screen creation software)

Simply touch the number for the item desired. The item will change to reverse video, to show it has been selected.



System Area Size

♦ System Area Size

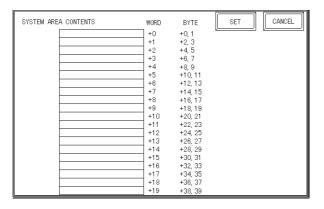
This field displays the total number of words used for the items selected from the SYSTEM AREA SETUP (Write: from 1 to 5 and Read: from 6 to 0).

When you press the Confirm key, the SYSTEM AREA CONTENTS screen appears to confirm the selected items



- These settings are enabled only when using Direct Access format.
- The selected System Area items, as displayed on the screen, become the System Data Area.

When these five items, "Current Screen Number", "Error Status", "Clock Data (Current)", "Change Screen Number", and "Display ON/Off", have been selected, word addresses are assigned to each item, in order, as shown here.



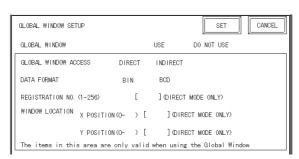
In the screen above, the device address used for [SET UP OPERATION SURROUNDINGS]'s "SYSTEM AREA START DEV / START ADR" is "+0".

Thus, in the example shown above, when the "SYSTEM AREA START DEV / START ADR" is "D00200", and the [CHANGE SCREEN NO.] has been designated, the address is shown as "+6" and you will need to then enter "D00206" (i.e. "D00200" + 6) to use this address.

For details about setting "SYSTEM AREA START DEV / START ADR", refer to
Reference 6.5.1 SET UP OPERATION SURROUNDINGS(1:1/n:1)

6.3.3 GLOBAL WINDOW SETUP

A GP2000 Series unit can display one *Global Window* and two *Local Windows* at any one time. The Global Window is common to all the display screens. The Local Window displays exclusively on a designated base screen. The GLOBAL WINDOW SETUP is described here.



GLOBAL WINDOW

Two options are available: **Use** and **Do Not Use**. If you select **Do Not Use**, ignore the items described below. Selecting **Use** enables the following options.

GLOBAL WINDOW ACCESS

Use this feature to designate whether values used by the GP are DIRECT or INDIRECT, i.e. the REGISTRATION NO. and the LOCATION values. When set as Direct, the REGISTRATION NO. and LOCATION selections are fixed to the values entered here. When set to Indirect, the WINDOW REG. NO.'s word address is used by the SYSTEM AREA as a variable. This means the REGISTRATION NO. written to it changes and, as a result, can call up multiple window screens as Global windows. You can also use this method to adjust the Global window's position by writing the desired X,Y coordinates to the SYSTEM AREA's LOCATION word addresses.

DATA FORMAT

Setup whether the REGISTRATION NO. and the LOCATION values are BIN or BCD values. This field is related only to indirect values.

REGISTRATION NO.

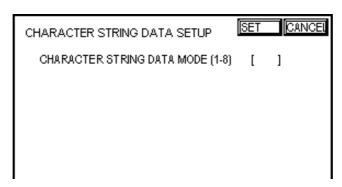
Enter the Window Screen Number used by the Global Window. This field is enabled only when GLOBAL WINDOW ACCESS is set to direct.

WINDOW LOCATION

Enter the value used for the (Global WINDOW) LOCATION. This field is enabled only when GLOBAL WINDOW ACCESS is set to direct. Use this setting to designate the top left coordinate on the screen registered as a Global Window. If you are installing the GP vertically, i.e. in portrait not landscape mode, designate the bottom left coordinate instead

6.3.4 CHARACTER STRING DATA SETUP

Character String Data ordering varies from manufacturer to manufacturer. Setup the Character String Data order here to match the corresponding PLC.





Setup the CHARACTER STRING DATA MODE to match the PLC type. Important Device type and Tag settings are unavailable.

■ CHARACTER STRING DATA MODE

Find the data storage order for your PLC in the following table, and setup the CHARACTER STRING DATA MODE.

- (I) Data Device Storage Order
- (II)Internal Word Byte LH/HL Storage Order
- Internal Double-word Word LH/HL Storage Order (III)

CHARACTER STRING DATA MODE(1-8) List

(I) Data Device Storage Order	(II) Internal Word, Byte LH/HL Storage Order	(III) Double-word Internal Word LH/HL Storage Order	Character String Data Mode
	LH order	LH order	4
Storage from Initial		HL order	2
data	HL order	LH order	5
		HL order	1
	LH order	LH order	6
Storage from End		HL order	7
data	HL order	LH order	8
		HL order	3

I) Data Device Storage Order

E.g. Characters ABCI

• Storage from Start Data

①	D100
2	D101
3	D102
4	D103

• Storage from End Data

4	D100
3	D101
2	D102
①	D103

II) Word Byte LH/HL Order

E.g. Characters ABCD

• 16 bit Device LH Order

2	1	D100
4	3	D101

• 16 bit Device HL Order

①	2	D100
3	4	D101

• 32 bit Device LH Order

2 (4	3	D100
-----	---	---	------

• 32 bit Device HL Order

①	2	3	4	D100
---	---	---	---	------

III) Double-word Word LH/HL Order

E.g. Characters



• 16 bit Device LH Order

TO DIL DEVICE LIT OTUEI				
2	D100			
①	D101			
4	D102			
3	D103			
(5)	D104			

• 16 bit Device HL Order

①	D100
2	D101
3	D102
4	D103
(5)	D104

E.g. Characters "ABCDEFGHIJKLMNOPQRST"

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

• 32 bit Device LH Order

32 of Device Lift of del					
2	①	D100			
4	3	D101			
6	(5)	D102			
8	7	D103			
(1)	9	D104			

• 32 bit Device HL Order

①	2	D100
3	4	D101
(5)	6	D102
7	8	D103
9	(1)	D104

Relationship between K-tag Write Character Value and PLC Device

♦ 16 bit Devices

The GP stores the character string from the start, as groups of 2, into one PLC Device.

When there are nine characters, they are arranged as shown below.



1 2 3 4 5 6 7 8 9 Null When the characters do not divide into 2 evenly, NULL is added at the end.

♦ 32 bit Devices

The GP stores the character string from the start, as groups of 4, into one PLC Device.



Note: When there are nine characters, they are arranged as shown below.

When the characters do not divide into 4 evenly, NULL is added at the end.

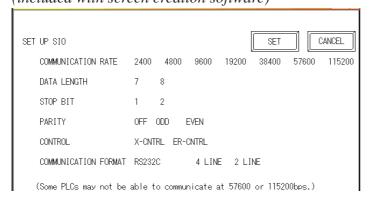
6.4 **SET UP I/O**

This section describes the communication setup with the Host (PLC) and the setup for any peripheral equipment. The SET UP I/O menu includes the SET UP SIO, SET UP PRINTER, SET UP TOUCH PANEL, COMMUNICATION SETUP, SOUND SETTINGS, EXPANSION SERIAL SETUP, EXPANSION SERIAL ENVIRONMENT SETUP*1, SETUP CAPTURE OPERATION, DISPLAY DEVICE SETTINGS, FUNCTION SETUP*2, and COMMUNICATION PORT SETUP menus.

6.4.1 **SET UP SIO**

This menu runs the settings related to Device/PLC communication. Be sure to match the settings listed below with the SIO setup on the Host (PLC). The settings will vary depending on the Device/PLC type.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)





If you have selected "YES" for the [SERIAL I/F CHANGE] on the [COMMUNICATION PORT SETUP] screen, or "Yes" for the [Serial I/F Switch] settings in the [Change Extend SIO Type] command, in the GP Screen Editor's [Project] menu, do not enter all of the settings related to device communication using the Extended SIO Script Protocol here. ([SET UP SIO] screen) These settings are required to set using the [EXPANSION SERIAL COMMUNICATION SETUP] screen.

COMMUNICATION RATE

The COMMUNICATION RATE (baud rate) is the data communication speed, measured in bits per second (bps), between the GP and PLC. Match the COMMUNICATION RATE values in both the PLC and GP. Depending on the rate selected, certain PLCs may not be able to be used.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual DATA LENGTH/STOP BIT

For data communication, the DATA LENGTH must be set up as 7-bit or 8-bit data. Also, the STOP BIT must be designated as either a 1-bit or 2-bit value.

PARITY

Set up whether no parity check, or an odd or even number parity check will be performed during communication.

^{*1} GP-2401/2501/2601 Series units have no expansion interface. These settings will be disabled.

^{*2} GP-2401/2501/2601 Series units have no function keys. These settings will be disabled.

CONTROL

CONTROL prevents the overflow of data sent and received. Select either XON/XOFF control or ER (DTR) control.

COMMUNICATION FORMAT

Select one of the following options for the communication format: RS-232C, RS-422 (4 line), or RS-422 (2 line).

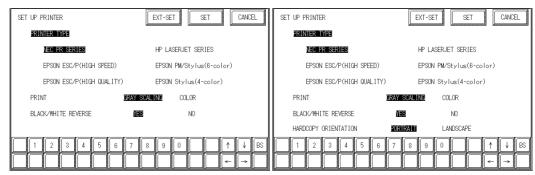


When using an RS422 cable and the Memory Link format, be sure to select the 4-line option.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)

6.4.2 SET UP PRINTER

These settings are used to designate the type of printer that will be connected to the GP.



<GP2401/2501 Series>

<GP2601 Series>

■ PRINTER TYPE

Printers that are compatible with NECPC-PR201/PL, EPSON ESC/P24-J84(C), HP Laser Jet PCL 4 commands, EPSON PM/Stylus (6-color ink), and EPSON Stylus (4-color ink) printers can be used.



- There is no difference in the quality and printing speed between EPSON ESC/P (High Speed) and EPSON ESC/P (High Quality) when the GP (corresponding to 64 colors or more) is used to print out hard copy of screen images.
- Using EPSON PM/Stylus (6-color ink), EPSON Stylus (4-color ink) printers, GP-PRO/PBIII for Windows Ver.6.2 or later is required. For details,

▼Reference ■ EPSON PM Series / EPSON Stylus Series

■ PRINT

Two selections [GREY SCALING] and [COLOR] are available. If you select [GREY SCALING], the same pattern will be applied to:

• Blue and Green • Light blue and Red • Purple and Yellow



- Since HP LaserJet Series printers do not support color printing, be sure to designate [GREY SCALING].
- With the [GREY SCALING] feature, printing patterns are reduced to 5 levels of gray from 256 or 64 colors.

Colors that do not appear in the printout are ones that have been converted to white.

■ BLACK/WHITE REVERSE

This setting is used for reversing the background and display color black/white color attributes. When the color is reversed, the background color is printed as black and the character color is printed as white.

<e.g.> When the background color is black and the display color is white.

When "BLACK/WHITE REVERSE" is selected.



When "BLACK/WHITE REVERSE" is **not** selected.





Note: This setting is enabled only when a screen display is printed. Alarm or Recovery data output is printed always as black, regardless of the setting selected.

■ HARD COPY ORIENTATION (available with GP-2601T only)

This setting designates the direction of the screen copy printout (horizontal or vertical). This setting is available with the GP-2601T unit only.



EPSON PM/Stylus (6-color ink) and EPSON Stylus (4-color ink) models do not support "Vertical" printing. When "Vertical" is selected, printing is not performed correctly.

■ EPSON PM Series / EPSON Stylus Series

◆ Restrictions for using EPSON PM / EPSON Stylus Series printers

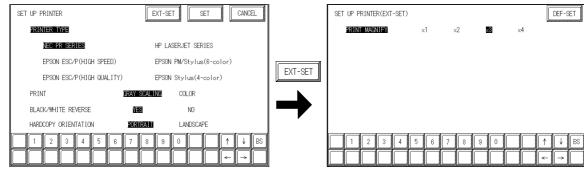
- EPSON PM/Stylus (6-color ink) and EPSON Stylus (4-color ink) printers do not support "Vertical" printing for "HARD COPY ORIENTATION" (screen copy printout.)
- When printing using an EPSON PM/Stylus (6-color) or an EPSON Stylus (4-color) printer, GP screen updating (tag processing, etc.) will be slower.
- Since OFFLINE Self-diagnosis (Printer I/F Check) is used only for ASCII code output, it will not produce a correct printout.
- A magnification value of 1 to 4 can be specified while printing out screen hard copy. With GP-2601T units, a magnification value of 4 may cause the printout to exceed the width of an A4 size paper.
- When screen data printout uses levels of shading, printout from these printers will differ from a different type printer (PR201, etc.). This is because colors are recognized based on shading level patterns and not on the density of shading.

Extension Settings

When specifying EPSON PM/Stylus (6-color) or EPSON Stylus (4-color) as "PRINTER TYPE", "PRINT MAGFNIFY" feature for screen data printout can be specified in the [SET UP PRINTER (EXT-SET)] screen.

Specify either EPSON PM/Stylus (6-color) or EPSON Stylus (4-color) as "PRINTER TYPE", and touch the key.

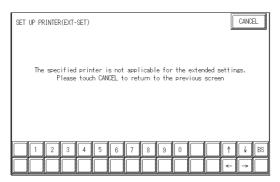
[SET UP PRINTER (EXT-SET)] screen will appear. Touch the desired magnification.





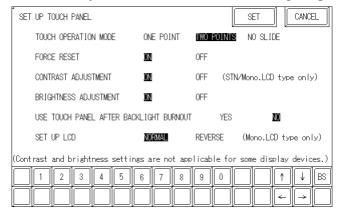
With GP-2601T units, a magnification value of 4 may cause the printout to exceed the width of an A4 size paper.

When specifying "PRINTER TYPE", except for EPSON PM/Stylus (6-color), EPSON Stylus (4-color) printers, touching the Key causes the following screen to appear. Touch the Key, and the [SET UP PRINTER] screen will reappear.



6.4.3 SET UP TOUCH PANEL

Touch operation and Force Reset setup, and Display Device adjustments are made here. There may be differences on these settings depending on the GP type.



TOUCH OPERATION MODE

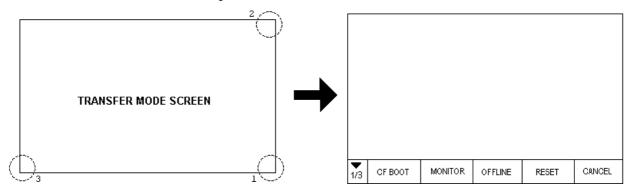
Designates either One Point, Two Point or No Slide. When No Slide is selected, dragging one's finger across the touch screen creates no screen response and only individually selected points will register.

FORCE RESET

Designates whether or not a FORCE RESET is performed.

♦ To Display the Menu Bar

While holding down the bottom right corner (1) of the screen, press the upper right corner (2). At the same time, press the bottom left corner (3) to enter the FORCE RESET mode. To activate Reset, press the **RESET** button, and to change to OFFLINE Mode, press **OFFLINE**.





Important You can perform FORCE RESET in either RUN mode or OFFLINE mode.



- While the GP is starting up, the Menu Bar will not display.
- Entering SYSTEM RESET is possible even when the PLC and GP are not communicating.

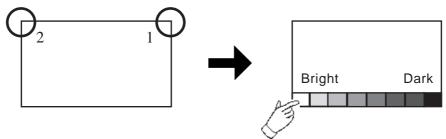
CONTRAST ADJUSTMENT

When this option is set ON, CONTRAST ADJUSTMENTs can be made through touch input. This setting is not available with GP-2401T/2501T/2601T units.



Be sure to press the GP corners in the order shown. If only corner (2) is pressed OFFLINE mode will start.

While pressing the upper right hand corner (1) of the screen, press the upper left corner (2) to enter CONTRAST ADJUSTMENT mode. Press the desired setting and the screen's contrast will change accordingly.

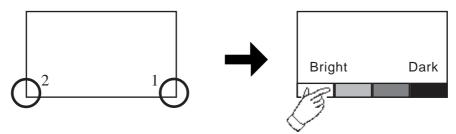




- To end CONTRAST ADJUSTMENT mode, touch anywhere on the screen, except the bottom section.
- CONTRAST ADJUSTMENT mode cannot be entered while the GP is starting up.
- CONTRAST ADJUSTMENTs can be made during RUN mode (PLC<-->GP communication).

BRIGHTNESS ADJUSTMENT

When set to ON, BRIGHTNESS ADJUSTMENT can be performed via touch input. Press the bottom left corner (2) of the screen while holding down the bottom right corner (1) to enter BRIGHTNESS ADJUSTMENT mode. Touch the left-side of the bar to brighten the display; touch the right-side of the bar to dim the display. This unit has four levels of adjustment.





Reducing the display brightness may cause flicker. You can reduce flicker by changing the display device settings.

▼ Reference ▲ 6.4.9 DISPLAY DEVICE SETTINGS

- To end BRIGHTNESS ADJUSTMENT mode, touch anywhere on the screen, except the bottom section.
- BRIGHTNESS ADJUSTMENT mode cannot be entered while the GP is starting up.
- BRIGHTNESS ADJUSTMENT can be used even during RUN mode (PLC<-->GP communication).

USE TOUCH PANEL AFTER BACKLIGHT BURNOUT

This option designates whether touch-operation is disabled or not when the backlight burns out. If this selection is set to [OFF], touch-operation will be disabled when the backlight burns out, which prevents the GP from sending input signals to the PLC.



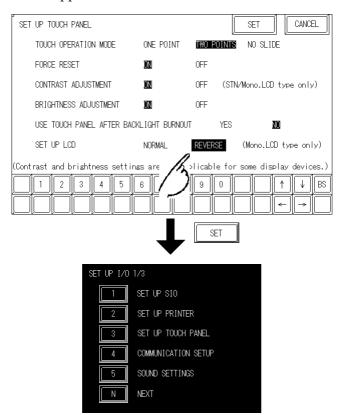
Normally, the GP unit detects a backlight burnout by monitoring the backlight's current flow, however, the GP may fail to detect this condition, depending on the type of backlight problem.



- When the backlight burns out, the Status LED's orange light turns ON, and the System Data Area's "Status" bit 10*1 will turn ON.
- The GP-2401/2501/2601 series models use two backlights (CCFL). The GP detects backlight burnout when one of the two backlights burns out, and disables touchoperations.
- If the [SYSTEM RESET] option is set to [ON], only "System Reset" can still be performed by touch-operation in case of backlight burnout.
- If the backlight burns out when the GP is OFFLINE, touch-panel operation is enabled, regardless of these settings.

SETUP LCD (GP-2501L only)

To reverse the screen display colors, touch the SET UP TOUCH PANEL screen' [SET UP LCD] to change the setting from "NORMAL" to "REVERSE", and then touch the "SET" key. The display color will be reversed and the previous screen will reappear.

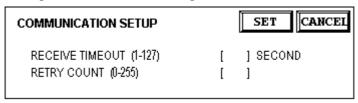


^{*1} Bit +6 (when using the Direct Access method), and bit +11 (when using the Memory Link method), will turn ON.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)

6.4.4 COMMUNICATION SETUP

The following explains the use the of the retry command to deal with errors, including those that occur during GP and PLC communication.



RECEIVE TIMEOUT (1 to 127)

Sets the value used for the data reception timeout (PLC <--> GP).

If the cable is not connected, data communication will Timeout after one second, regardless of this setting's value. The default is "10" seconds.

An error message may appear on your personal computer if:

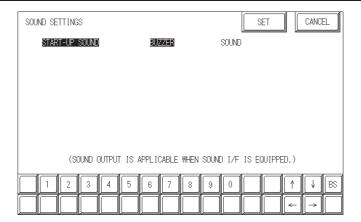


- You transfer screens from your PC to the GP after a PLC communication error has occurred and the error is not yet cleared.
- Your GP's RECEIVE TIMEOUT value is set to 30 seconds or more.

RETRY COUNT (0 to 255)

Designates how many times the GP tries to send data to the PLC when a PLC communication error occurs. An Error Message will appear on the GP after the GP tries to send data to the PLC the number of times set by this option. The default is "2".

6.4.5 SOUND SETTINGS



START UP SOUND

Select the type of sound that is output when the GP starts. If "BUZZER is selected, the GP's internal buzzer will sound. If "SOUND" is selected, a sound will output from the speaker connected to the GP.



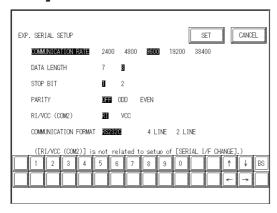
Note: The optional Bus Conversion unit and Sound Output unit (Multi Unit S or Multi Unit E) are required to connect the GP-2501/2601 Series to speakers.

6.4.6 EXPANSION SERIAL COMMUNICATION SETUP

Since GP-2401/2501/2601 Series units are not equipped with an expansion serial I/F. If you have selected the [NO] for the [SERIAL I/F CHANGE] on the [COM-MUNICATION PORT SETUP] screen, or "No" for the [Serial I/F Switch] settings in the GP Screen Editor (when not using the Extended SIO Script Protocol for communication), the expansion serial communication setup is not required.



- Even if a GP-2501/2601 Series unit is equipped with a Bus Conversion Unit and a Multi Unit S, the Expansion Serial Interface cannot be used.
- If you have selected "YES" for the [SERIAL I/F CHANGE] on the [COM-MUNICATION PORT SETUP] screen, or "Yes" for the [Serial I/F Switch] settings [Change Extend SIO Type] command, in the GP Screen Editor' [Project] menu, enter all of the settings related to device communication using the Extended SIO Script Protocol here, [EXPANSION SERIAL COMMUNICATION SETUP] screen. Then, the settings on the [SET UP SIO] screen will be disabled.



COMMUNICATION RATE

The COMMUNICATION RATE (baud rate) is the data communication speed, measured in bits per second (bps), between the GP and the Devices.

▼Reference ★ GP-PRO/PBIII for Windows Device/PLC Connection Manual DATA LENGTH/STOP BIT

For data communication, the DATA LENGTH must be set up as 7-bit or 8-bit data. Also, the STOP BIT must be designated as either a 1-bit or 2-bit value.

PARITY

Set up whether no parity check, or an odd or even number parity check will be performed during communication.

RI/VCC (COM2)

GP-2401/2501/2601 Series units have no expansion interface. This setting will be disabled.

COMMUNICATION FORMAT

Select one of the following options for the communication format: RS-232C, RS-422 (4 line), or RS-422 (2 line).

6.4.7 EXPANSION SERIAL ENVIRONMENT SETUP

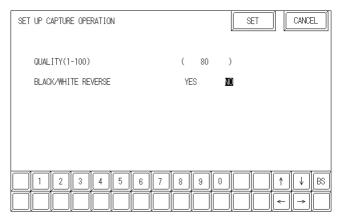
Since GP-2401/2501/2601 Series units are not equipped with an expansion serial I/F, the expansion serial environment setup is not required.



Even if a GP-2501/2601 Series unit is equipped with a Bus Conversion Unit and a Multi Unit S, the Expansion Serial Interface cannot be used.

6.4.8 SETUP CAPTURE OPERATION

With this feature you can save a JPEG image of the GP's screen to a CF Card.



QUALITY (1 - 100)

Sets the captured image quality. The image quality can be set from 1 to 100. 100 is the highest quality.

B/W REVERSE

The white part in the image that is created in the screen creation program is reversed to black, and the black part is reversed to white. All other colors (except white and black) are not reversed.

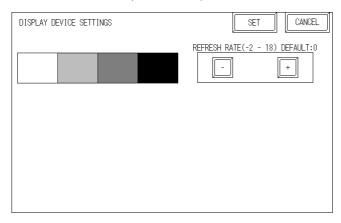


The monochrome LCD GP saves image data as black in the CF Card, regardless of **Note:** the GP's B/W REVERSE setting.

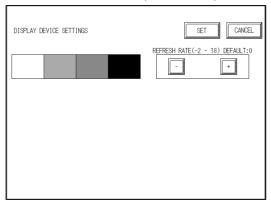
6.4.9 DISPLAY DEVICE SETTINGS

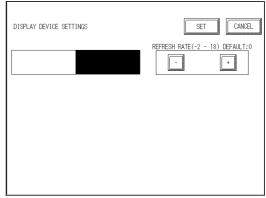
Depending on the GP's Environment and Brightness settings, sometimes the screen's display will seem to flicker. This may be because the brightness setting is too low, or that the GP's surrounding environment has become either too hot or too cold. In order to correct this problem, please use the following setting.

• STN color LCD (GP-2501S)



• Monochrome LCD (GP-2501L)





<When using 8 levels of gray>

<When using Black and White>

REFRESH RATE

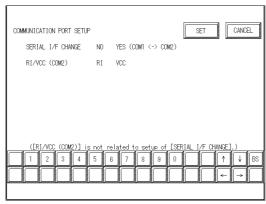
Refer to the samples shown on the GP unit's screen to gauge whether the "+" or "—" adjustments help to correct the problem. While the normal setting value is "0", there are two levels available in the minus direction (from "0") and 18 levels available in the "+" direction (from "0").

6.4.10 FUNCTION SETUP

Since the GP-2401/2501/2601 Series units are not equipped with a function key, function setup is not required.

6.4.11 COMMUNICATION PORT SETUP

This screen allows you to set up the connection environment of the GP's communication port (COM1).



SERIAL I/F CHANGE

Selecting "YES (COM1 <->COM2)" designates that the communication used for the Extended SIO Script Protocol starts at the Serial I/F (COM1).

In OFFLINE mode, the SERIAL I/F CHANGE setting is set to "NO".



After selecting "YES (COM1 <->COM2)", enter all of the settings related to device Note: communication using the Extended SIO Script Protocol, [EXPANSION SERIAL COMMUNICATION SETUP] screen. The settings on the [SET UP SIO] screen will be disabled. \(\sigma_{Reference}\) 6.4.6 EXPANSION SERIAL COMMUNICATION SETUP RI/VCC (COM2)

Since GP-2401/2501/2601 Series units have no expansion interface, this setting will be disabled.

PLC SETUP 6.5

Set up the GP System Area and the Unit number in this screen. Because 1:1 and n:1 GP connections utilize different settings, confirm your connection's needs before using any settings. The following assumes that the Direct Access format is used.

Note: The screens that appear will depend on the PLC type you selected in the screen creation software.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (in*cluded with screen creation software)*

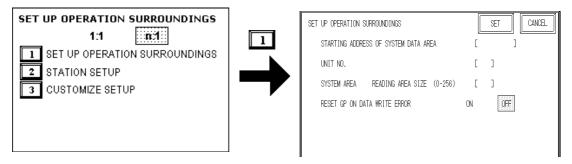
When the GP-PRO/PBIII for Windows Ver 3.0 "Simulation" feature is used, the OPERATION SURROUNDINGS menu cannot be used.

SET UP OPERATION SURROUNDINGS(1:1/n:1) 6.5.1

Enter the PLC System Data Area and the Unit Number settings here. The same options are available for both 1:1 and n:1 (Multi-link) connections.

For an n:1 (Multi-link) Connection, System Data Area settings must be setup for each GP connected to the PLC.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (in*cluded with screen creation software)*



STARTING ADDRESS OF SYSTEM DATA AREA

Setup the System Data Area's Start Address. Device addresses that can be allocated will differ depending on the type of PLC used.

▼Reference A GP-PRO/PBIII for Windows Device/PLC Connection Manual (in*cluded with screen creation software)*

UNIT NO.

Enter the PLC UNIT number here. Check that it matches the one set up in the PLC.

SYSTEM AREA READING AREA SIZE (0-256)

When using a Block Display Trend Graph, setup the Reading Area Size (in word units) to match the Trend Graph's data size. Use this feature when you wish to allocate the Reading Area in the PLC Data Register (D), or Data Memory (DM).



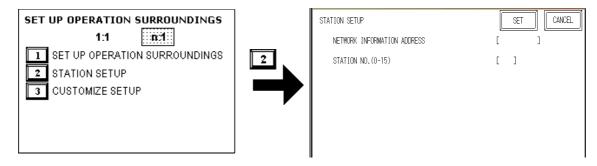
If you are not using the Reading Area, leave the 0 default values intact. This will allow you to perform high speed data communication.

RESET GP ON DATA WRITE ERROR

Designates the mode which enables you to cancel the error from the error display when the Write error occurs.

6.5.2 STATION SETUP(n:1)

STATION SETUP, required with an n:1 (Multi-link) setup, checks whether data communication is being performed correctly between the GP and the PLC.



NETWORK INFORMATION ADDRESS

With an n:1 (multi-link) connection, the Network Information setting uses 2 words for its data. These two (2) words consist of a Connection List and a Validation List (described later in this section). These areas are allocated in the PLC's Data Register (D) or Data Memory (DM). Addresses which can be allocated will differ depending on the PLC type.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)

PLC Data Register





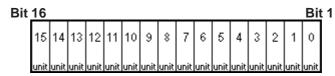
In the NETWORK INFORMATION ADDRESS, setup the same address to all the GP's connected to the same link unit. Also, when the link unit has 2 ports, be sure they do not use the same address.

◆ Connection List

The word address for the Connection List sets up the number of GP's connected to the PLC, which must be previously entered in the PLC. When these GP's are connected to the PLC, the corresponding PLC bit number for each GP Station (see below) turns ON.



When the GP is connected to the PLC, and the option of GP-only correspondence ends and OFFLINE mode is entered, the GP Station Number then turns the corresponding PLC bit OFF.



For example, when 4 GP units—shown by bits 0, 2, 3, and 5—are connected, 002D (h) is written here.

Bit 16															Bit 1					
	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	002D (h)			



- Be certain to setup this data before running.
- Turn all bits not related to the GP OFF.

◆ Validation List

This area responds to the correspondence from each connected GP. In the Validation List, when the same bit numbers as the Connection List turn ON, the correspondence is accepted. The Station Numbers of the communicating GPs turn their corresponding PLC bit number ON.

Bit 16															Bit	<u>t</u> 1	
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
	unit																

If the correspondence between the GP and PLC is correct, the same value as in the Connection List is written to the Validation List.

For example, the value 002D (h) in the Connection List, setup as the 0 bit, 2 bit, 3 bit, and 5 bit, writes to the Validation List.

Bit 1	6															Bit	1
Connection List	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	002D (h)
Validation List	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	002D (h)



- When the Connection List and Validation List do not match, a COMMUNICATION ERROR occurs. Check the setup again.
- When changing the connection, first turn all the bits OFF.

STATION NO. (0-15)

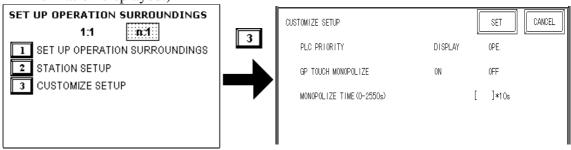
This is the setup for the GP Station Number mentioned above. The setup range is from 0 to 15, and the only other restriction is the GP STATION NO. must be unique in the system. If STATION NO.'s are repeated, a COMMUNICATION ERROR occurs.



The STATION NO. is the number allocated to the particular GP unit. This number is not related to the Link Unit Machine number.

6.5.3 CUSTOMIZE SETUP (n:1)

The Customize function modifies the n:1 (multi-link) connection's communication method to make it more efficient. To perform GP<-->PLC communication efficiently, the user should first determine whether they wish to have Operation or Display priority set for the GP. Based on this, the communication response speed can be upgraded. (However, this also depends on the complexity of the screen information displayed.)



PLC PRIORITY

According to how the GP is used, select either Operation priority (OPE.) or Display priority (DISPLAY).

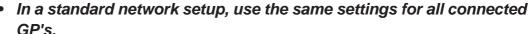
Display

Setup the GP to this option when using the GP mainly as a monitor screen. The GP will command a higher display speed as a result; however, the response time for the touch panel's operations will slow.

Operation

Set up the GP to this option when using the GP mainly as a monitor screen. The touch panel's numeric value input or switch function response speed will become higher as a result.

When "OPE" is selected, the response time for the touch panel's operation is quicker than the response time when the "DISPLAY." is selected, however, the display refresh cycle time will slow.

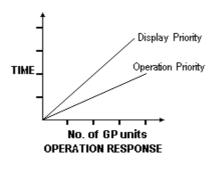


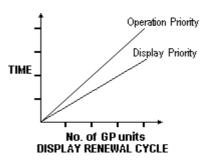


To increase the display speed, be sure the addresses used are consecutive addresses. When bit addresses are used, use addresses that are consecutive to word units.

Speed Difference between Display Priority and Operation Priority

When using the Mitsubishi Electric Corporation A3A PLC, with consecutive addresses (80 words, not including the System Area), the difference in reading speed is as shown in the following graphs.





GP TOUCH MONOPOLIZE

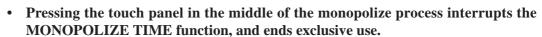
The monopolizing of touch panel use can be set ON or OFF. When you want to use the PLC exclusively with a Momentary operation setup on the touch panel, turn GP TOUCH MONOPOLIZE ON.

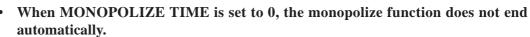
When this setup is ON, the touch panel uses the PLC exclusively whenever the momentary operation setup on the panel is pressed. In this way, you can use the inching operation with a momentary switch. When you stop pressing the panel, exclusive use ends.

Reference GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)

MONOPOLIZE TIME (0-2550S)

This field controls the length of time for the monopolize process when no other touch panel operations are performed. The Monopolize process ends when the time set here elapses, and the 7th bit of word address LS14 turns OFF.



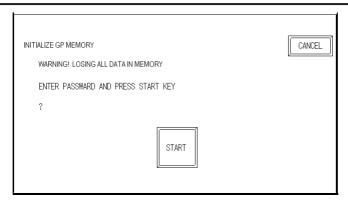


Reference For further information about the contents of System Data Area LS6 (status) and LS14 (control), refer to GP-PRO/PBIII for Windows Device/PLC Connection Manual (included with screen creation software)

6.6 INITIALIZE INTERNAL MEMORY

This section explains how to initialize the GP's internal data or a CF card inserted in the GP. Select one of the menu items, [INITIALIZE MEMORY], [INITIALIZE CF CARD] and [CSV DATA INDEX] selections in the [INITIALIZE MEMORY] menu.

6.6.1 INITIALIZE GP MEMORY





- You cannot cancel the Initialization procedure after pressing the Start key.
- · All data in SRAM will be erased.
- Important Initialization does not erase the SYSTEM SET UP, the SIO protocol, or the internal clock settings.

To initialize the GP internal memory, enter the common password **1101**, or the password entered in the SYSTEM SET UP screen.

▼Reference Chapter 5.3 INITIALIZATION



Note: The time required for Initialization is between 10 and 20 seconds.

6.6.2 INITIALIZE CF CARD



Deletes all data in the CF Card installed in the GP.

Initialization cannot be canceled once the START switch is touched.



Initializes the CF Card. Enter the common password "1101" or the password you designated in the "SYSTEM SET UP" menu.

Reference For details about entering the password's numeric values, refer to 5.3 INITIALIZATION

6.6.3 CSV DATA INDEX

Specific data-transfer CSV files (ZR*****.CSV) on the CF Card can be transferred from the CF Card directly to the PLC (filing) or from the PLC directly to the CF Card (logging). For the details about the CSV Data Transfer Function,

▼Reference GP-PRO/PB III for Windows Tag Reference Manual.

Here creates the index file of the CSV files that are saved into the CF card with the CSV data transfer function.



Important

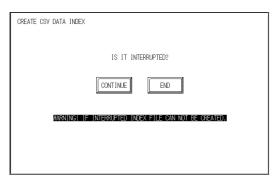
Touch the [START] key, then the operation to create the index file will start.

Do not open the CF card cover during the operation to create the index file. The data may be damaged.



Too many number of CSV files may cause a time loss for creating the index file. It will take about 10 minutes for creating an index file of the 4,000 CSV files.

If you touch the [CANCEL] key during the operation to create the index file, the operation will stop, then the following screen will appear.



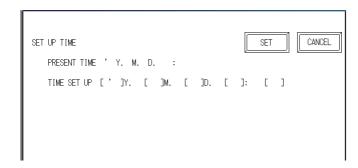
CONTINUE

The operation restarts. When the message "CREATED INDEX FILE. PLEASE PRESS END KEY" appears, finish the program.

FND

Deletes the creating index file, then the [INITIALIZE MEMORY] screen will reappear.

6.7 SET UP TIME



Sets the GP's internal clock.

SET UP TIME

Enter date and time corrections to the date and time displayed in the PRESENT TIME.



The GP's internal clock has a slight error. At normal operating temperatures and conditions, with the GP 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 -350 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. "Hour" and "Minute" display on the screen but "Second" does not display.

6.8 SET UP SCREEN

This screen is used to enter the number for the initial screen displayed after powering up, the character size when in RUN mode, and other general screen items.



INITIAL SCREEN NO. (1-8999)

Set up the screen file number that will display first upon powering up. If the BIN option for DATA TYPE OF SCREEN NO in SYSTEM SET UP had been selected, enter a number from 1 to 8999. Or, if BCD was the option set up, then input a number from 1 to 1999.

ALARM MESSAGE

Set up the character size of the ALARM MESSAGE when the Alarm Bulletin is activated.

<When using single-byte characters>

1 2 V size=1; H size=1 V size=2; H size=2 V size=4; H size=4 16×8 pixels 32×16 pixels 64×32 pixels

<When using double-byte characters>

V size=1; H size=1 V size=2; H size=2 V size=4; H size=4 16×16 pixels 32×32 pixels 64×64 pixels

ONLINE ERROR DISPLAY

Set up whether or not error messages display during RUN mode.

FONT SETTING

Selects the font type displayed on the GP screen during operation.

KANJI FONT OUALITY

Designates the font display quality for enlarged characters.

♦When [FONT SETTING] is set to [JAPAN]

Single-byte characters will remain 8x16-dot characters when they are enlarged. Double-byte characters are displayed as:

[Standard] Here, characters are displayed using 16x16-dot "blocks". When enlarged, this font will remain a 16x16-dot character. (Compatible with GP-*30 series units.)

[HIGH] When enlarged to double size, Level 1 JIS Kanji Code characters are displayed as 32x32-dot characters. Level 2 JIS Kanji Code characters remain 16x16-dot characters. (Compatible with GP-*50 series and GP-70 series units.)

[1,2] When enlarged to double size, both Level 1 and Level 2 JIS Kanji Code characters are displayed as 32x32-dot characters.

♦ When [FONT SETTING] is set to any other type (i.e. CHINESE, I-ASCII, KOREA or TAIWAN)

[Standard] Half-size (single-byte) characters are displayed as 16x8-dot characters. Full-size characters, regardless of the display size used, will always be displayed as 16x16-dot characters. When enlarged, this font will stay as 16x16-dot character. (Compatible with GP-*30 Series units)

[HIGH(1)] All half-size (single-byte) characters (ASCII code: 21h to 7Dh, i.e. alphanumeric characters) except "^" and "'" will display as high quality characters.

- 16x16-dot or larger characters will display as high quality 16x16 fonts.
- 32x32 or larger characters will display as high quality 32x32 fonts.

Full-sized (double-byte) characters will display as 16x16-dot characters and remain 16x16-dot characters when enlarged.

[HIGH(1,2)] All single-byte characters (ASCII code: 21h to 7Dh, i.e. alphanumeric characters) except "^" and "'" will display as high quality characters.

- When 16x16 dots are used for a character, it will display as a high quality 16x16 character.
- When 32x32 or larger dots are used for a character, the character will display as a high quality 32x32-character.

Full-sized (double-byte) characters (i.e. [KOREA], [TAIWAN-ESE] and [CHINESE]) will display as 32x32-dot characters when enlarged to 32x32-dot or larger characters.

Memo



- 1. GP RUN Mode
- 2. SELF-DIAGNOSIS
- 3. Troubleshooting
- 4. Error Messages

RUN Mode and Errors

Mode 7.1 RUN

There are two ways of entering the GP's RUN mode; immediately after plugging in the unit's power cord, or from the GP's OFFLINE mode.

7.1.1 After Connecting the Power Cord

The method of GP startup will vary, depending on the "START TIME" setting in the "Initialization Settings" / "System Setup" area.

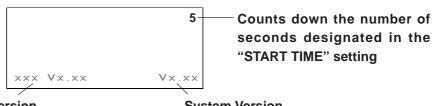
■ When START TIME is set to "0"

When the GP's power cord is connected, the version information screen shown below will appear. Next, the screen designated by the initialization screen file number ("Initialization Settings" / "System Setup" area) will appear, and the GP will start to communicate with the PLC.



■ WhePpn START TIME is set to any value other than "0"

In this case, when the GP's power cord is connected, the following version information screen will appear. In the top right corner of the screen, a value will appear and count down the number of seconds designated by the "START TIME" setting. Next, the screen designated by the initialization screen file number ("Initialization Settings" / "System Setup" area) will appear, and the GP will start to communicate with the PLC.



If the initialization screen's file number is not designated, or a number is designated that does not exist, the version information screen will remain.

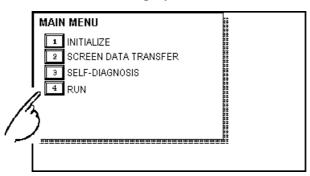


Note: There is a possibility that the screens shown above may not display in the beginning depending on the display device's start-up time.

Chapter 7 - RUN Mode and Errors

7.1.2 Via OFFLINE Mode

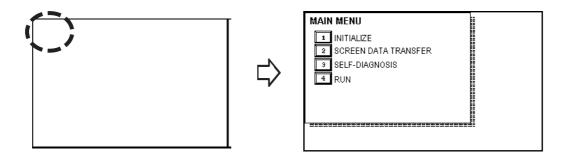
Touch the MAIN MENU's RUN selection to start your downloaded "project". The INITIALIZE area's SET UP SCREEN feature designates the first screen that appears in RUN mode, and, after this screen appears, communication with the PLC begins. If, however, the designated initial screen has not been created, or does not exist, the above display will remain.





Note: To enter OFFLINE Mode, simply touch the top left corner of the GP's screen within 10 seconds after connecting the GP's power cord.

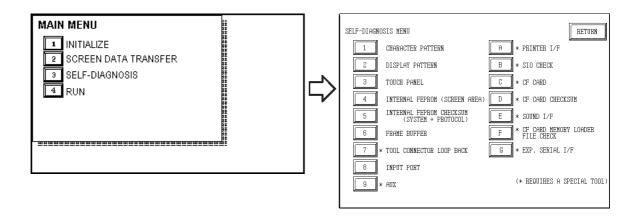
E.g. After powering up the GP, the initial screen that appears is equipped with a built-in (invisible) switch in the top left corner. Touch this switch within 10 seconds to change the GP from RUN to OFFLINE mode.



7.2 SELF-DIAGNOSIS

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

7.2.1 SELF-DIAGNOSIS ITEM LIST



- 1 Checks the characters inside the internal Character ROM.
- 2 Checks all the figures and tiling patterns.
- 3 Checks each GP touch panel square.
- 4 Checks the internal hard disk contents (FEPROM).
- **5** Checks the System and Protocol of the GP Internal Memory (FEPROM).
- **6** Checks the internal display memory (Frame Buffer).
- 7 Checks the Tool Connector control lines and send/receive lines.*1
- **8** Checks the Input Port (for Digital's maintenance use only).
- **9** Checks the AUX control line.*1
- **A** Checks the printer interface.*1
- **B** Checks the RS-232C and RS-422 send/receive lines.*1
- C Checks the status of the CF Card.*1
- **D** CF Card Checksum.*1
- **E** Checks the status of the GP's Sound Output feature.*1*2
- F Checks the status of the CF Card Memory Loader File.*1
- **G** Checks the status of the Expansion Serial I/F.*1*3

^{*1} This item requires the use of special equipment (cable, connector, etc.).

^{*2} The optional Bus Conversion unit and Sound Output units (Multi Unit S or Multi Unit E) are required to perform self-diagnosis for the GP-2501/2601 Series' "Sound Output" feature.

^{*3} Self-diagnosis of the GP-2401/2501/2601 Series' "Expansion Serial" feature cannot be performed.

Chapter 7 - RUN Mode and Errors

7.2.2 SELF-DIAGNOSIS - Details

This section explains the contents of SELF-DIAGNOSIS. For information on how to operate the Screen, **Reference Chapter 5**, "OFFLINE Mode"; for information about how to set up the Special Tools, **Reference Chapter 3**, "Installation and Wiring".

CHARACTER 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.

DISPLAY PATTERN

Used when the buzzer will not sound and when the device contents will not display correctly to check the drawing function. It does this by running checks on the various screen pattern displays (8 screens), the ON/OFF Display, and KANJIROM CHECKSUM. When the ON/OFF Display is checked, the Buzzer ON/OFF check is run simultaneously. If KANJIROM CHECKSUM is normal, **OK** displays; if there is a problem, **NG** displays.

TOUCH PANEL

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

INTERNAL FEPROM CHECKSUM (Display Area)



- If you run this check menu, all screen data that have been created will be deleted. Therefore, be sure to back up data prior to running this check.
- When this check menu is completed, you need to initialize the internal memory (FEPROM).

This menu is used for checking the internal FEPROM. Use this check menu when an error related to screen display occurred. When using this check menu, you need to enter the password *1.

While checking, the screen display will change in the following order.



If there is no error, the message [OK] will appear, if there is an error, an error message will appear.

The number of the symbol marks (i.e. "OOOO", etc.) shown on the screen may vary depending on the GP type.

The symbol mark "O" indicates the GP is operating the erase checking. The symbol mark "*" indicates the GP is operating the R/W checking.

^{*1} Enter either the password you have designated in the "INITIALIZE" screen or the common password "1101".

Chapter 7 - RUN Mode and Errors

INTERNAL FEPROM CHECKSUM (System + Protocol)

The Internal FEPROM System and Protocol check searches for any problems that may arise during operations. When running the check, the screen will change as follows.

0000

When the FEPROM is normal, **OK** displays; if there is a problem, the screen stops in the middle of operation. This check does not erase the System or Protocol.

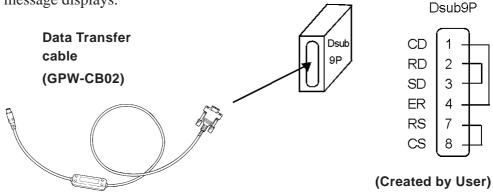
FRAME BUFFER

The Frame Buffer (display memory) Check looks for any display problems that may develop. When everything is normal, **OK** displays; when there is a problem, an error message displays.

TOOL CONNECTOR

Use the Tool Connector Control line and Send/Receive line check when the GP cannot send and receive data from the PC. To run the check, connecting a *Tool Connector Check Loop Back Cable* (Dsub9 pin, pin-side) mounted to the *Downloading Cable* (provided in the software package) is necessary.

When everything is normal, **OK** displays; when there is a problem, an error message displays.



INPUT PORT

Used for Digital's maintenance.

AUX

Checks the AUX control line. Used when an inching output error or a monitor output error occurred. To enable this check menu, you need to connect the PLC input unit.

▼ Reference ▲ 2.3.3 AUX Input/Output I/F

This check uses the input unit's LED.

The LED turns ON in the following order.

- 1) RUN, ALARM, and then BUZZ.
- 2) When all LED turn ON, they start to turn OFF in the same order as they turned ON.
- 3) When all LED turn OFF, the check has been completed.

PRINTER I/F

Checks the printer I/F. Used when the printer does not function properly. You need to connect the printer prior to using this checking menu.

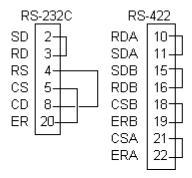
Connecting the printer buffer may cause an error, therefore, connect the GP and the printer directly.

If there is no error, (ASCII Code: 20 to 7D<HEX> and A0 to DF<HEX>) will be output (printed) and the message [OK] will appear on the screen. If there is an error, an error message will appear.

SIO CHECK

Checks the RS-232C and RS-422 SIO lines for areas where communication problems develop. In the menu, select which check to run. 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. (RS-232C, RS-422 common)



CF CARD

Checks the CF Card's Read/Write. Prior to using this check menu, you need to insert the CF Card in the GP. The CF Card needs to have more than 1K bytes usable space. If there is no error, the message [OK] will appear. If there is an error, an error message will appear.

CF CARD CHECKSUM

Takes the Checksum of the CF Card's files and operates the check. Prior to using this check menu, you need to insert the CF Card in the GP.

This check menu can check the following files.

- Filing Data
- CF Card's Image Data
- CF Card's Sound Data

When the check is finished, the following items will appear on the screen.

- The number of checked files
- The number of files that have an error
- The file name where the most recent error occurred

SOUND I/F

Checks if Sound Output operates. Prior to using this check menu, connect the speaker to the GP. The first three notes of the musical scale (do, re,mi) will sound.



Note: When using a GP-2501/2601 Series unit, self-diagnosis must be performed even when the optional Bus Conversion Unit and Sound Output Unit (Multi Unit S and Multi Unit E) are connected to speakers.

CF CARD MEMORY LOADER FILE CHECK

Checks the CF Card's Memory Loader Tool when it does not start. If there is no error, the message [OK] will appear. It there is an error, the message [ERROR] will appear.

EXPANSION SERIAL I/F

The GP-2401/2501/2601 series unit is not equipped with the expansion serial I/F. Therefore, the self-diagnosis feature is not available.

7.3 Troubleshooting

This section describes how to find and resolve problems that may occur on the GP. If there is a problem with the PLC, please refer to the corresponding PLC manual.

7.3.1 Possible Types of Trouble

The following items are problems that may occur while using this unit.

(A) No Display

The screen will not display even when the unit is powered On. Also, during RUN mode, the screen disappears.

(B) No GP/HOST Communication

The GP unit cannot extract data from the host. An error message may appear on the screen as a result.

▼Reference 7.4 Error Messages

(C) Touch Panel Does Not Respond

The touch panel does not react when pressed, or the reaction time is very slow.

(D) Buzzer Sounds when GP power is turned ON

The GP's buzzer will sound intermittently after power is first turned ON.

(E) Clock Settings Cannot be Entered

Even after clock settings are entered, the GP unit's clock settings remain eg.) 00/01/01.

(F) OFFLINE displays During RUN Mode

The GP goes to the OFFLINE mode unexpectedly while operating, or the GP automatically goes to the OFFLINE mode when the power is turned ON.

For these first five problems, see the troubleshooting tables on the following pages.

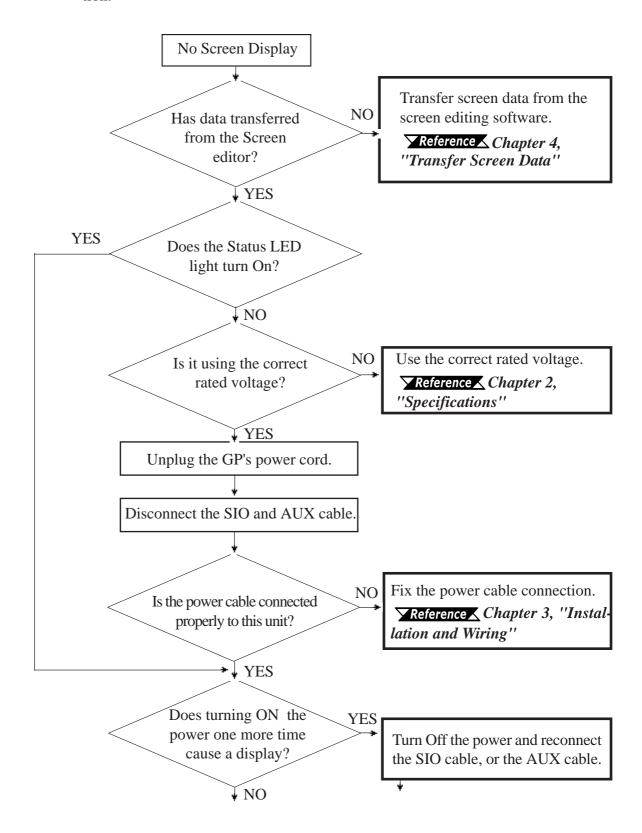
For the last problem (F), a SYSTEM ERROR may have developed while displaying the OFFLINE mode screen.

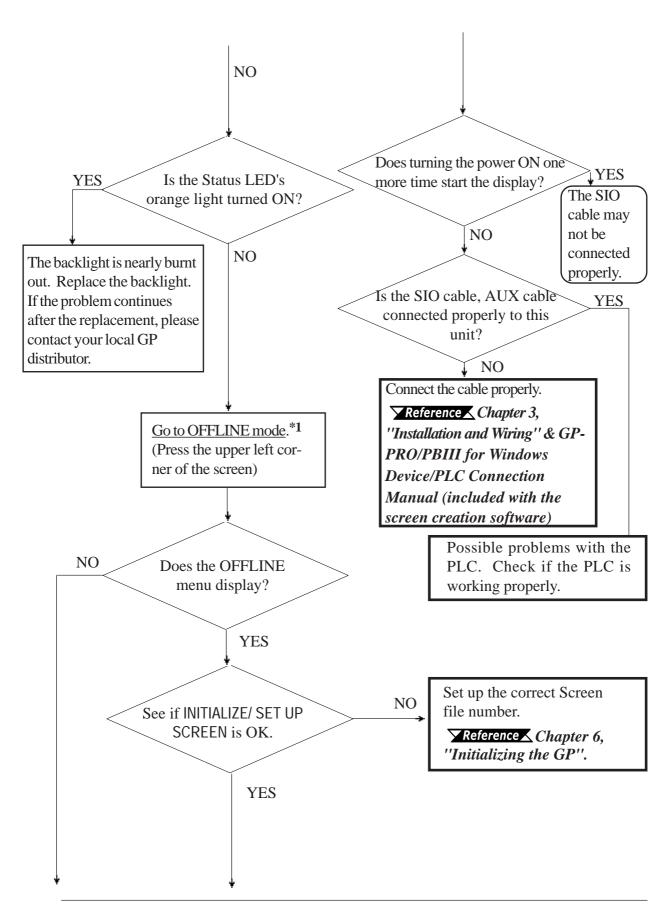
▼Reference 7.5 Error Message Details

Be sure that no object has touched the screen accidentally if the GP goes to the OFFLINE mode without displaying an error message when the power turned ON. If any object may have possibly touched the top left corner of the screen within 10 seconds after the power turned ON, that may cause the GP to go OFFLINE.

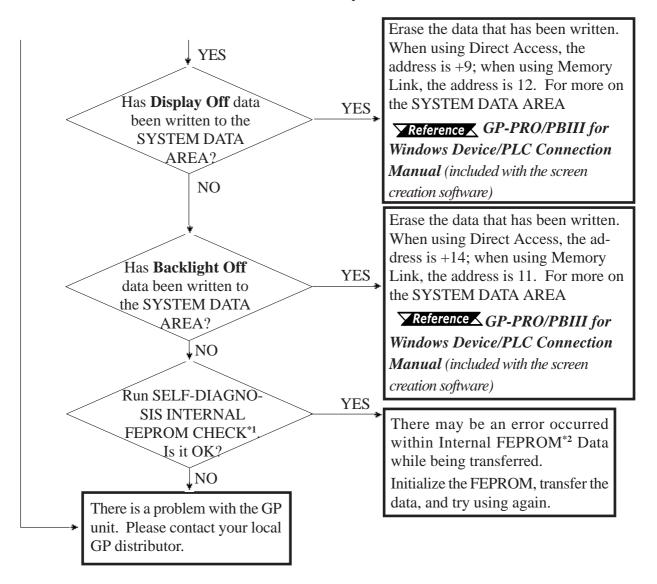
7.3.2 No Display

Follow the flowchart below when the screen does not display when powering up, or the screen turns OFF by itself during RUN mode, to find an appropriate solution.





^{*1} To make the OFFLINE screen appear, turn the power OFF, then ON, and press the upper left corner of the screen within 10 seconds.



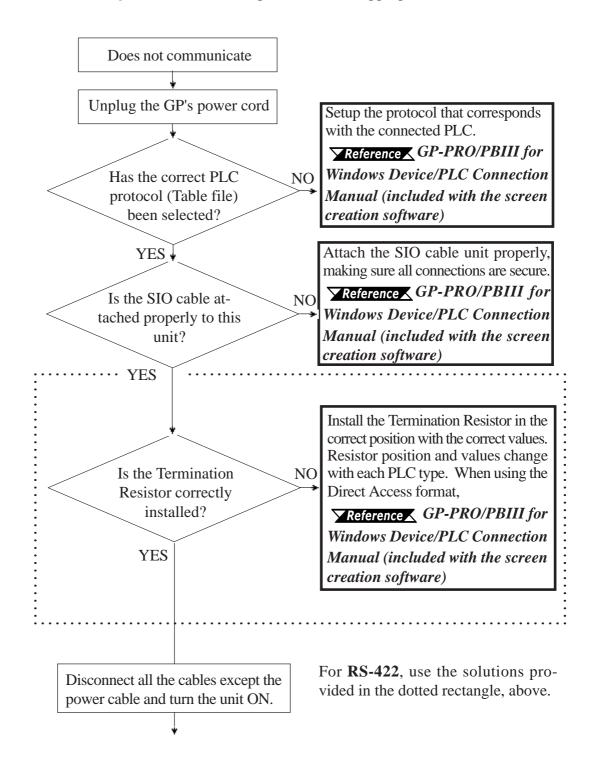
^{*}I When you run the SELF-DIAGNOSIS area's FEPROM CHECK, all screen data is erased. Therefore, be sure to make a backup of all GP screens prior to performing this check.

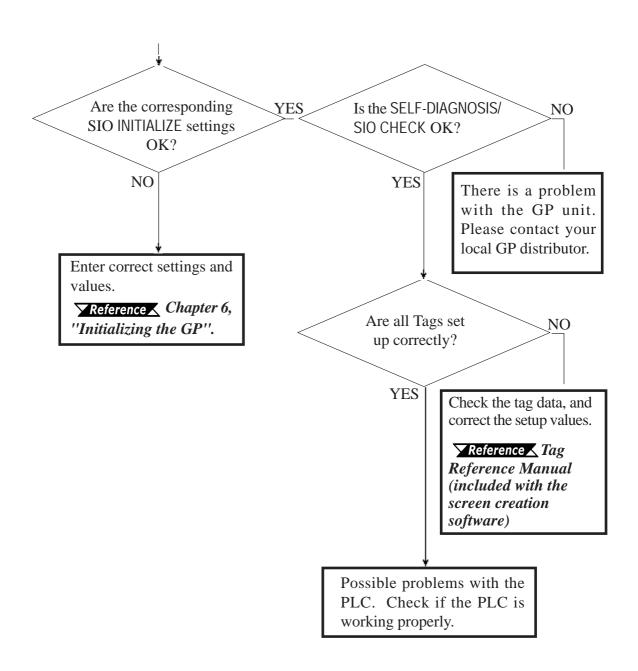
^{*2} Also known as "FEPROM" (Flash Electronic Erasable Programmable Read Only Memory).

7.3.3 No GP/Host Communication

When the GP will not communicate with the host PLC, follow the flowchart below to find both the cause of the problem and a suitable response.

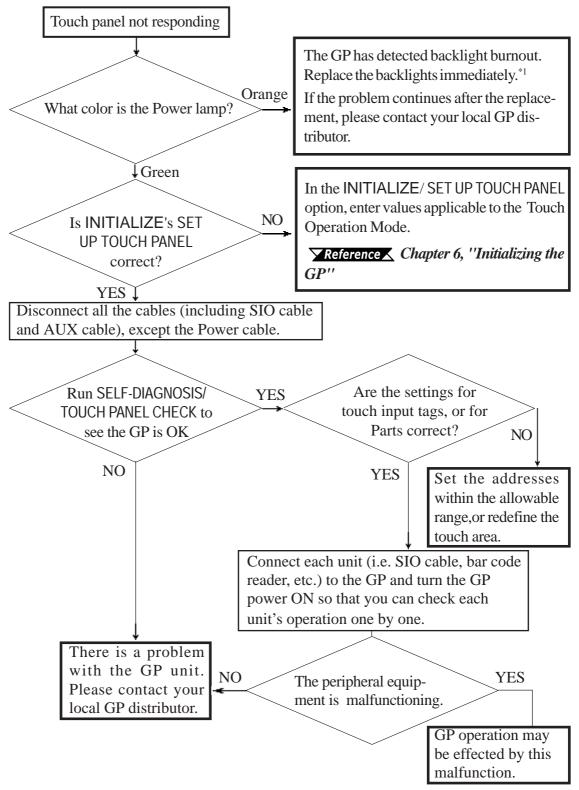
Or, if an error message displays on the screen, check the error code (refer to the *Error Messages* section in this chapter) to find the appropriate solution.





7.3.4 Touch Panel Does Not Respond

When the touch panel does not respond, or its response time is very slow after it is pressed, please use the flowchart below to find the origin of the problem, and the appropriate solution.



^{*}I If the screen is visible after backlight burnout is detected, only one of the two backlights is burnt out. In this case, touch-operations can be enabled by changing the initial settings (touch-operation mode settings) to enable touch-operations. However, it is recommended that the backlight be immediately replaced.

Reference 6.4.3 SET UP TOUCH PANEL, 8.3 Replacing the Backlight

7.3.5 Buzzer Sounds when GP power is turned ON

If you start the GP unit and the internal buzzer sounds, use the following chart to find the reason and the appropriate solution.

Buzzer Sound	Timing	Reason	Solution
Continous beep (approx. 1 sec. intervals)	When power to the GP is turned ON	The GP's system program is destroyed.	Send the correct GP system program from the screen creation software to the GP, via the Transfer screen's "Forced Setup" feature. Turn on the GP's dip switch #1 (next to CF Card slot) and use the CF Memory Loader Tool to set up the GP.
Two beeps - Repeating (approx. 1 sec. intervals)	When power to the GP is turned ON	A different GP unit's system program has been accidentally installed in this GP.	Send the correct GP system program from the screen creation software to the GP, via the Transfer screen's "Forced Setup" feature. At this time an error will appear on the Screen Creation Software's screen, however, simply turn the GP's power supply OFF and then ON, and data transfer will automatically start. Turn on the GP's dip switch #1 (next to CF Card slot) and use the CF Memory Loader Tool to set up the GP.
Three beeps - Repeating (approx. 1 sec. intervals)	When the GP's dip switch #1 is turned on (next to CF Card slot) and power to the GP is turned ON.	The CF Card's Memory Loader Tool (MLD****.SYS) file is missing, or destroyed.	Reformat the CF Card and replace the CF Card's Memory Loader Tool file.
	When the GP is started via the Menu Bar's "CF BOOT" key.	The CF Card's Memory Loader Tool (MLD****.SYS) file is missing.	
Three beeps - Repeating (approx. 1 sec. intervals)	When the GP is started via the Menu Bar's "CF BOOT" key.	The CF Card's internal boot program (IPL.SYS) is destroyed.	Reformat the CF Card and replace the CF Card's Memory Loader Tool file.

If the CF Card's boot-up program (IPL.SYS) or the Memory Loader Tool (MLD****.SYS) programs appear to be damaged or destroyed, use the GP's internal diagnostic program "CF Card Memory Loader File Check" utility to confirm the condition of these files.

▼Reference 7.2 Self Diagnosis

7.3.6 Clock Settings Cannot be Entered

This problem occurs when the lithium backup battery's voltage, used for the internal clock, runs out. To enter the clock settings, please read the CLOCK SET UP ERROR directions.

▼Reference ▲ 7.5.4 CLOCK SET UP ERROR

7.3.7 Error Screens

If the following error screen appears when you start the GP, it indicates an error has occurred and the GP is not set up correctly. Be sure to perform screen transfer (Force System Setup) again.

This unit's system data was not down loaded. Please download the system data again (Force System Setup)

7.4 Error Messages

This section explains the messages that appear when an error has occurred in the GP unit during RUN mode. The problem causing the error message and its related countermeasure are explained in the table below.

After a problem has been solved, unplug the GP's power cord and then reattach it. (Only the latest error message will appear on the GP screen)

7.4.1 Error Message List

Error Message	Problem	Countermeasure
SYSTEM ERROR	During screen data transfer, an	▼ Reference ▲
(03:**)	unrecoverable error occurred.	7.5 Error Message Details
SYSTEM ERROR	During screen data transfer, an	▼ Reference ▲
(***:***:***)	unrecoverable error occurred.	7.5 Error Message Details
ILLEGAL ADDRESS IN	Settings are used that overlap addresses.	Set the addresses correctly
SCREEN DATA		after checking the screen data.
UNSUPPORTED TAG IN	The GP currently in use does not support	Set the Tag correctly after
SCREEN DATA	the desired Tag.	checking the screen data.
PLC NOT CONNECTED	The communication cable is not connected	Re-connect the
(02 : FF) and (02 : F7)	correctly.	communication cable
		correctly.
	PLC's power is not turned ON.	Turn ON the PLC's power.
(02 : FE)	GP unit INIT IALIZE settings (Setup I/O, PLC	Check the INITIALIZE settings
	Setting) are incorrect.	and make any necessary
		corrections.
	The host and GP Powering up sequence	Turn ON the PLC's power and
	was incorrect.	wait for 2-3 seconds, then turn
		ON the GP's power.
	The communication cable is not connected	Check the communication
	properly.	cable and connect it correctly.
RECEIVE DATA ERROR	The communication cable was	Turn the GP OFF and then
(02 : FD)	disconnected while the GP was ON.	ON again.
	The GP is powered OFF, then ON during	Turn the GP OFF and then
	communication with PLC.	ON again.
	Noise occurred in the communication	Check the communication
	cable.	cable and connect it correctly.
GP STATION NO.	This GP's station number is same as	Check all GP station numbers,
DUPLICATION ERROR (02 : F9)	another GP.	and set them so they are all
(02.13)		unique.
	PLC is powered OFF, then ON during	Turn the GP OFF and then
	communication with GP.	ON again.

Error Massage	Problem	Countermeasure
NETWORK ADDRESS	The SIO address used for this GP is	Check all GP's SIO address
ERROR (02 : F8)	different from other GP's. (Only for the Multi-	settings, and correct any that
	Link connection)	are incorrect.
PLC COM. ERROR	Specific PLC related error, or an error has	▼ Reference ▲
(02 : **)	occurred with the PLC.	7.5 Error Message Details
SCREEN MEMORY	Screen Data is corrupted:	Check the screens that have
DATA IS CORRUPT (nnnn:mmmm)	*nnnn indicates the Screen Number that	errors, correct all errors, and
(,	has an error.	then transfer the screen data
	*mmmm indicates the number of screens	again.
	that have errors.(Decimal)	
CLOCK SETUP	The backup battery for the internal clock is	▼ Reference ▲
ERROR	running low.	7.5 Error Message Details
SCREEN TRANSFER	An error occurred in the data transmission	Re-transfer the screen data.
ERROR	from the screen editor to the GP panel.	
SCREEN TAG LIMIT	Tags are setup beyond the tag limit (max. of	▼ Reference ▲
EXCEEDED	385.)	7.5 Error Message Details
OBJ. PLC HAS NOT	The host PLC set up in the Editor program	▼ Reference ▲
BEEN SETUP (**)	does not match the PLC in use.	7.5 Error Message Details
	The CF Card is not a GP compatible type.	Use Pro-face's optional CF
CF CARD		Card.
RECOGNITION	The timing of the CF Card's insertion was	Reinsert the CF Card, or turn
ERROR	incorrect, and the GP unit cannot recognize	the GP ON/OFF with the CF
	it.	Card inserted.
D-SCRIPT ERROR (***)	D-Script settings (data) are incorrect.	▼ Reference ▲
		7.5 Error Message Details
GLOBAL D-SCRIPT	Global D-Script settings (data) are incorrect.	▼ Reference ▲
ERROR (***)		7.5 Error Message Details
EXTENDED SIO	Extended SIO script settings (data) are	▼ Reference ▲
SCRIPT ERROR (***)	incorrect.	7.5 Error Message Details
OFDIAL I/F OLIANOF	I	
SERIAL I/F CHANGE	The GP currently in use does not support	
ERROR	The GP currently in use does not support the "Serial I/F Switch" feature, however in	
	''	▼ Reference ▲

7.5 Error Message Details

7.5.1 SYSTEM ERRORS

Indicates a fault in the basic operations of the GP.

Following the error message, an error code, as shown below, will appear. Report the error number and details on how the error developed to your local GP distributor.

\blacksquare SYSTEM ERROR (03 : x x)

An unrecoverable error occurred during screen data transfer.

\blacksquare SYSTEM ERROR (x x x : x x x : x x x)

An unrecoverable error occurred during screen data transfer.

Possible Solutions

- Check if the GP's Power Cord and the Input signal line have been wired separately from each other.
- Check that the FG line has been grounded correctly, according to your country's standards.
- Re-send the screen data from the PC to the GP.
- If other types of communication errors, such as [RECIEVE DATA ERROR], [PLC COM. ERROR], have also occurred, try to correct those problems also.

▼Reference 7.4.1 Error Message List

If the above mentioned methods do not solve the problem, please contact your local GP distributor.

■ When the GP changes to OFFLINE mode during RUN mode

When the GP changes to OFFLINE mode without the user first pressing the screen, there is a possibility that the screen data has been damaged. In this case, after the SYSTEM ERROR displays, the screen automatically reverts to OFFLINE mode after about 10 seconds. Run the INITIALIZE MEMORY command and transfer the GP screen data again from your PC.

In most cases, system errors are related to the problems mentioned below.

■ Factors that may cause System Errors

Environment Related Problems

If an error occurs which has no apparent connection to the GP's current operation, the error may be due to the condition of GP's operating environment. This can include noise or electrostatic interference in the power code or the communication line. In this case you need to check if the power code and the communication line wiring and FG grounding are correct.

Screen Data or Project Data Related Problems

If an error seems to be caused by a particular GP operation, the error may be related to the screen or project data transferred to the GP. In this case, try sending screen data via the FORCE SYSTEM SETUP feature, which will transfer both the screen data and the project data to the GP.

Reference For details about the FORCE SYSTEM SETUP feature, refer to **GP-PRO/PBIII for Windows Operation Manual, Transfer Settings section.**

GP Unit Related Problems

If disconnecting and then re-connecting the power code corrects an error, the problem may not be related to the GP unit itself. However, to identify if the GP unit has any problems, run the OFFLINE mode's SELF-DIAGNOSIS program.

Peripheral Equipment Related Problems

(When the GP is equipped with a printer I/F)

If an error occurs only during printout, there may be a problem with the printer. Check the printer cable wiring and the FG line as well as the printer itself.

When a communication error occurs continuously

(When using the Direct Access method)

If a communication error occurs continuously, the GP may define the error as a system error. In this case you need to solve the problem causing the original communication error.

7.5.2 ILLEGAL ADDRESS IN SCREEN DATA

Caused by an overlap of addresses.

After the error message, error codes, as listed below will appear. If the error cannot be fixed, please report the error code and details on how the error developed to your local GP distributor.

ILLEGAL ADDRESS IN SCREEN AREA (00B:XXX:XXX)

Error No. 2
(Refer to Table below)

■ Overlapping Addresses

Error 1	Error 2	Meaning
	191	All or part of the T-tag *1 or S-tag address
0C1	192	range overlap the addresses of System Data
	193	Area.
_	194	All or part of the System Data Area address,
0C2	195	A-tag, or S-tag address range overlap the
	196	addresses setup in a T-tag. *1
	197	All or part of a T-tag ^{*1} , S-tag or K-tag address
0C3	198	range overlap the address range set in an A-
	199	tag (Alarm Message.)
0C9	19B	All or part of a T-tag ^{*1} , S-tag or K-tag address range overlap the address range set in an A-tag (Log alarm.)

^{*1} For details about the T-tag (trend graph) and A-tag (alarm messages),

Reference GP-PRO/PBIII for Windows Tag Reference Manual (included with the screen creation software)



Overlapping addresses, other than the ones mentioned above, can also cause the Illegal Address message.

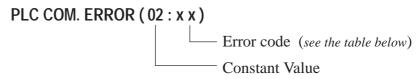
E.g. When the starting address of the System Data Area is set to 100, and the tag below is setup:

Tag Name/ Part ID No.	Word Address	Tag Format
N1	99	BCD32

Starting from addresses 99, two(2) words are used, which causes it to overlap address 100.

7.5.3 PLC COM. ERROR

Appears when the address setup for tags exceeds the address range used in the host (PLC.) Check the Error Number that appears and use the following table to solve the problem.



Error #	Problem	Countermeasure
	The communication settings for this	For Memory Link type, check the data or settings
FC	unit and the host do not match.	the host sends. For the PLC communication,
		check the communication speed.
FB	The address set on a tag, the address used for storing data for Trend graph, or the address set by an alarm message is out of a set range. * Memory to Memory Link type. * Siemen's PLC Series.	* When using Memory Link type: Set the addresses within the set range of the System Data Area (0 to 2047), and re-send correct data. * When using a Toyoda Machine Works PLC: Set the addresses within the set range of the devices. * When using a Yaskawa PLC: Set the addresses within the set range of the devices.
FA	Address range error	Set the addresses within the allowable range.
53	When using a Matsushita Electronics PLC, and there are too many screen tags, the PLC will not receive data.	Decrease the number of tags on the screen.
51	The tag addresses, Trend graph data storage address, Alarm message Registry address, do not exist in the PLC's internal memory.	* When using a Fuji Electric PLC: Setup the addresses in a device range that exists.
Others	The Error code for each PLC can be found in the table on the last page of this chapter. Then, look up the Error Number in the indicated PLC manual. Or, report the Error Number to the PLC manufacturer.	



In Hitachi's HIDIC H (HIZAC H) Series, the error code is divided into 2 bytes, whereas the GP Error Number is composed of 1 byte codes.

E.g.	Reply	Return	Display
	Command 0 1	Code 0 7	Error No.

When the Display Error Number is 8*, or 5*, use only the left column as the error number.



- In Toshiba's PROSEC T Series, the Error Code is 4 characters long; on the GP, Error Numbers are changed to and displayed in Hexadecimal.
- With the Allen-Bradley PLC-5 and SLC-500 Series, the EXT/STS error codes have been re-mapped to start at D0 HEX, so they will not conflict with other error codes. When looking up the error number in the PLC manual, subtract D0 h from the GP error code to find its error value.

E.g. GP Error Code
$$D1 \longrightarrow 01$$
 EA $\longrightarrow 1A$

7.5.4 CLOCK SET UP ERROR

This message displays when the lithium backup battery's voltage used for the internal clock runs out. To reset the error, you need to turn the GP's power OFF and then ON again. Leave the GP ON continuously and the battery's charge will become sufficient for backup after 24 hours, and will be fully charged in approximately 96 hours. If the battery is incorrectly replaced, the battery may explode. To avoid the danger, please do not replace the battery yourself. When the battery needs a replacement, please consult with your local GP distributor.

After changing the backup battery, set up the internal clock.

The lifetime of the backup battery depends on the ambient temperature and the amount of current being charged and used. The table below gives a general indication of how long the battery will last.

Battery Temperature	40°C or lower	50°C or lower	60°C or lower
Expected	10 years or	4.1 years or	1.5 years or
Lifetime	longer	longer	longer

7.5.5 SCREEN TAG LIMIT EXCEEDED (max. of 384)

When tags are setup beyond the tag limit, all tags in excess of number 384 will be disabled. Plus, when tags involve registered Windows and loaded screens, they are disabled in this order: Window Registry, Load Screen.

- 1. Disabled registered windows start from the last screen used.
- 2. Disabled loaded screens start from the last screen used.

To correct this problem, reduce the number of tags to within the allowed limit.

7.5.6 OBJ. PLC HAS NOT BEEN SETUP

The host PLC setup in the Editor program (i.e. the .prw file) does not match the PLC in use. Use the Error Code that follows the error message to select the proper PLC type and correct the GP's INITIALIZE setup data so that it matches this.

7.5.7 D-Script and Global D-Script Errors

The following error messages are displayed when D-Scripts and Global D-Scripts are not correctly set up. The GP-2401/2501/2601 Series unit displays the error message at the bottom of the GP screen.

	Error Message
D-Script	D-Script Error (***)
Global D-Script	Global D-Script Error (***)

The following table lists the numbers assigned to (***) in the above error messages. Error Nos. "001" and "002" are displayed at power-on, and Error Nos. "003" and "004" are displayed when an error occurs during the script processing.

No.	Description	Type Script
	The total number of Global D-Scripts exceeds the limit.	
001	The maximum number of Global D-Scripts is 32. Note	Global D-Script
	that functions are included in the counts.	
002	The total of all devices in the Global D-Script exceeds	Clobal D Script
002	the limit of 255 devices.	Global D-Script
003	Either the function being called does not exist, or that	D-Script
003	function has caused an error.	Global D-Script
004	Function connect he needed more than 10 levels	D-Script
004	Function cannot be nested more than 10 levels.	Global D-Script

7.5.8 Extended SIO Script Error

The following error message is displayed when an Extended SIO Script is not correctly set up. The GP-2401/2501/2601 Series unit displays the error message at the bottom of the GP screen.

	Error Message
Extended SIO Script	EXTENDED SIO SCRIPT ERROR (***)

The following table lists the numbers assigned to (***) in the above error message. Error No. 001 is displayed at power-on, and Error Nos. 003 and 004 are displayed when an error occurs during the script processing.

No.	Description
	The total number of the Functions of Extended SIO Scripts
001	exceeds the limit.
	The maximum number of Extended SIO Scripts is 254.
002	Reserved
003	The function that is being called does not exist.
004	Functions cannot be nested more than 10 levels.
	An old Extended SIO Script protocol is being used for the
005	GP system. Extended SIO Script cannot be run when this error
003	occurs. Be sure to install and run a new Extended SIO protocol
	(Version 1.12 or later).
006	An incompatible function was found in the screen data's
000	Extended SIO Script. Be sure to install and run a new GP system.

7.5.9 Serial I/F Change Error

The following error message is displayed when the GP currently in use does not support the "Serial I/F Switch" feature, however in the GP screen editor, "Yes" has been specified for the switch. GP-2401/2501/2601 Series units display the error message at the bottom of the screen.

	Error Message	
Serial I/F Change	SERIAL I/F CHANGE ERROR (***)	

The following table shows the unit revision codes that correspond to the "Serial I/F Switch" function.

Built-in Standard	Product Name	Unit	Corresponding Revision
GP-250° Serial Interface (Dsub25 Pin)	GP-2401T	GP2401-TC41-24V	All Revisions
	GP-2501L	GP2501-LG41-24V	All Revisions
	GP-2501S	GP2501-SC11	Rev.A and later
		GP2501-SC41-24V	All Revisions
	GP-2501T	GP2501-TC11	Rev.A and later
		GP2501-TC41-24V	All Revisions
	CD 2/01T	GP2601-TC11	All Revisions
	GP-20011	GP2601-TC41-24V	All Revisions

Memo

Chapter

- 1. Regular Cleaning
- 2. Periodic Check Points
- 3. Changing the Backlight

8 Maintenance

8.1 Regular Cleaning

8.1.1 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 a strong acid compound to clean the unit.
- Do not use hard or pointed objects to operate the touch-screen panel, since it can damage the panel surface.

8.1.2 Installation Gasket Check/Replacement

The installation gasket protects the GP and improves its water resistance. For instructions on installing the GP's gasket, refer to

▼Reference ✓ Chapter 3 "Installation and Wiring"

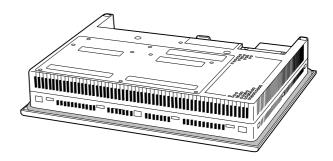


A gasket which has been used for a long period of time may have scratches or dirt on it, and could have lost much of its water resistance. Be sure to change the gasket at least once a year, or when scratches or dirt become visible.

■ Installation Gasket Attachment Procedure

(The illustrations below show the procedures for the GP-2501T/GP-2501S/GP-2601T models. However, these procedures are also the same for the GP-2401T.)

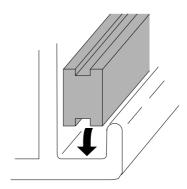
1) Place the GP on a flat, level surface facing the display face downwards.



2) Remove the gasket from the GP.

Chapter 8 - Maintenance

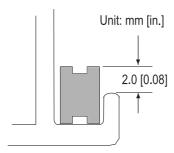
3) Attach the new gasket to the GP. Be sure to insert the gasket into the GP's groove so that the gasket's groove sides are vertical.



4) Check if the gasket is attached to the GP correctly.



- The gasket must be inserted correctly into the groove for the GP's moisture resistance to be equivalent to IP65f.
- The upper surface of the gasket should protrude approximately 2mm out from the groove. Be sure to check that the gasket is correctly inserted before installing the GP into a panel.



8.2 Periodic Check Points

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

GP Operation Environment

- Is the operating temperature within the allowable range (0° C to 50° C)?
- Is the operating humidity within the specified range (10% RH to 90% RH, dry bulb temperature of 39°C or less)?
- Is the operating atmosphere free of corrosive gasses?

Electrical Specifications

• Is the input voltage appropriate?

Model Name	Input Voltage	
GP2501-TC11, GP2501-SC11, GP2601-TC11	AC85V to AC132V or AC85 to AC265V*1	
GP2401-TC41-24V, GP2501-TC41-24V,		
GP2501-SC41-24V, GP2501-LG41-24V,	DC19.2V to DC28.8V	
GP2601-TC41-24V		

Related Items

- Are all power cords and cables connected properly? Have any become loose?
- Are all mounting brackets holding the unit securely?
- Are there many scratches or traces of dirt on the installation gasket?

Reference For more information on how to determine the revision version, see "Revision Version" (page 14).

^{*1} All GP units marked Revision "3" conform to the specifications.

8.3 Replacing the Backlight

When the unit's backlight burns out, the unit's status LED will turn orange.



If the status LED continues turning ON in Orange after the backlight replacement, GP unit malfunction may be occurred. Please contact your local GP distributor.

If the OFFLINE menu's "USE TOUCHPANEL AFTER BACKLIGHT BURNS OUT" feature is set to "NO", the GP's touch panel will be disabled. *1

Reference 6.4.3 SET UP TOUCH PANEL

GP2000 Series units use a CFL, long-life type backlight. The actual life of the backlight however, will vary depending on the GP's operating conditions, and replacement may be required. A GP2000 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 (time required for brightness to fall to half its normal level.)

⚠ WARNINGS

- To prevent an electric shock, be sure the GP's power cord is unplugged from the power outlet prior to replacing the backlight.
- When the power has just been turned OFF, the unit and backlight are still very hot. Be sure to use gloves to prevent burns.
- The backlight is very fragile. Do not touch the glass tube directly or try to remove its power cord. If the glass tube breaks you may be injured.

^{*1} If "NO" has been selected for the OFFLINE menu's "FORCE RESET" feature, Touch-Panel operation is disabled Reference 6.4.3 SET UP TOUCH PANEL



Note: Use the following table to check that you have ordered the correct back-划 light.

GP Model	Rev.	Backlight Model
GP2401-TC41-24V	-	PS400-BU00-MS
GP2501-TC11		GP577RT-BL00-MS
GP2501-TC41-24V	-	GP3//K1-DLUU-W3
GP2501-SC11	-	PS501S-BU00
GP2501-SC41-24V	-	PS500S-BU00
GP2601-TC11	Rev.4 is marked.*1	CA3-BLU12-01
GP2601-TC11	Rev.4 is not marked.*1	PS600-BU00
GP2601-TC41-24V	-	CA3-BLU12-01



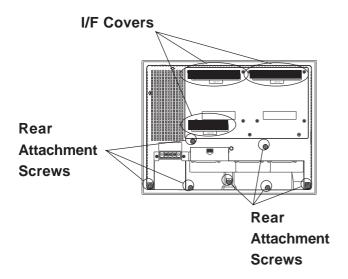
The GP2501-LG41-24V unit's backlight connot be changed by the User. To request replacement service, please contact your local GP distributor.

For backlight replacement details of PS400-BU00-MS, PS501S-BU00, PS600-BU00, GP577RT-BL00-MS, refer to the replacement backlight unit's installation guide.

▼Reference For more information on how to determine the revision version, see "Revision Version" (page 15).

^{*1} The corresponding backlight unit differs depending on GP2601-TC11 unit's marked Revision.

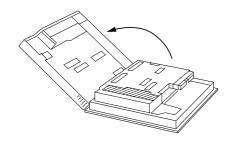
8.3.1 Replacing CA3-BLU12-01



1) Turn the GP's power OFF (i.e. disconnect the GP's power cord). Remove the three (3) I/F covers, and use a Phillips screwdriver to remove the case's seven (7) rear attachment screws. Pivot the rear cover open, starting from the top of the unit.



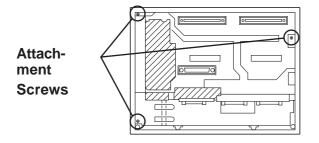
Since the attachment screws are small, be sure not to lose them Important or allow them to fall inside the GP's case.



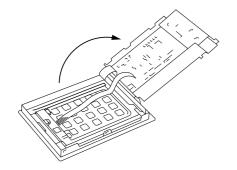
2) The cover is fastened at the bottom, and hinges open.



Be sure not to break the rear cover's four (4) alignment tabs *Important* when you open it.



3) Loosen the three (3) circuit board attachment screws.



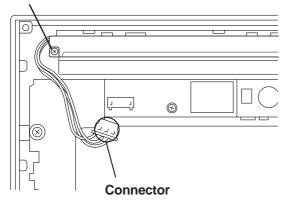
4) The circuit board is attached on one side, and hinges open.



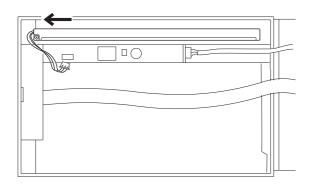
When the GP's power has just been turned OFF, the circuit *Important* board chassis is still very hot! Be sure to wear gloves to prevent being burned.

Chapter 8 - Maintenance

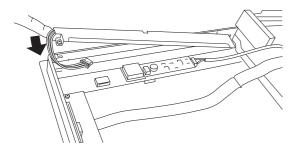
Attachment Screw



5) Disconnect the backlight's one (1) power connectors.



6) Loosen the backlight unit attachment screw. Next, slide the backlight in the direction shown and lift it forward and remove it from the GP.



- 7) Insert the new backlight in the GP. Insert the unit by sliding it in the direction shown in step 6), then, tighten the unit's attachment screw.
- 8) Connect the backlight's one (1) power connector. Next, close the circuit board and secure the rear case in place using the attachement screws removed in steps 1), 2) and 3).



- Be sure not to pinch or cut any of the GP unit's internal wiring when closing the case.
- If any of the attachment screws becomes misplaced, check to be sure that they have not fallen inside the GP. If a screw has fallen inside the GP, do not connect the unit's power cord until it has been removed.

Memo

Index

ACCESS lamp 9, 3-11	Error Messages 7-17 errors or omissions1 Extended SIO Script Error 7-25
aerospace equipment 6 ALARM MESSAGE 6-32	F
Available Software 1-5, 1-6	
В	failsafe system design 7 Features and Performance 2-4 FRAME BUFFER 7-5
BRIGHTNESS SETTING 6-16	
С	G
CAUTIONS 3-9, 3-11 CF Card 3-11 CF Card ACCESS switch OFF 3-11 Changing the Backlight 8-4 CHARACTER STRING DATA Mode List 6-7 CHARACTER STRING DATA SETUP 6-7 Cleaning the Display 8-1 COMMUNICATION INTERFACE 6-11 Communication Port Setup 6-23 COMMUNICATION RATE 6-10, 6-20 COMMUNICATION SETUP 6-18 Connecting the GP's Power Cord 3-6, 3-8 CONTRAST SETTING 6-16 CONTROL 6-11 Copyright 1 crime prevention devices 7 CSV Data Index 6-30 CUSTOMIZE SETUP (n:1) 6-27, 6-29, 6-30	Global D-Script Error 7-24 GLOBAL WINDOW 6-6 GLOBAL WINDOW ACCESS 6-6 GLOBAL WINDOW SETUP 6-6 GP data 3-11 GP TOUCH MONOPOLIZE 6-28 GP's Display Panel11 GP-2501L 12 Graphic Panel Dimensions 2-13 Grounding the GP 3-9, 3-13 I INITIAL SCREEN NO. 6-32 Initialization Items 6-2 Initialization Screen 6-1 INITIALIZE INTERNAL MEMORY 6-29 INITIALIZE MEMORY 6-2 Installation 3-1, 3-10, 3-11, 3-14 Installation Fasteners 2-16
D	Interface Specifications 2-7 INTERNAL FEPROM CHECKSUM (System & Pro-
DATA FORMAT 6-6 DATA LENGTH 6-10, 6-20 Display Features 2-4 Display Panel 2-11 DISPLAY PATTERN 7-4	tocol) 7-4, 7-5 M medical devices 7 Mitsubishi MELSEC-AnA Series PLC 1
E	Moisture Resistant Gasket 3-1
Electrical Specifications 2-1 Environmental Specifications 2-2 Error Message Details 7-19 Error Message List 7-17	Moisture Resistant Gasket Replacement 3-1, 8-moisture resistant seal 3-1 MONOPOLIZE TIME (0 to 2550s) 6-28

Index

N		Structural Specifications 2-3	
NETWORK INFORMATION (DET No Display 7-8 No GP/HOST Communication 7 No GP/Host Communication 7 nuclear power control devices 6	7-8 7-12	SYSTEM AREA READ SIZE (0-256) 6-24 SYSTEM AREA SETUP 6-4 System Area Size 6-4, 6-9 SYSTEM AREA START (DEV/ ADR) 6-24 SYSTEM ENVIRONMENT SETUP 6-2, 6-3 SYSTEM RESET MODE 6-15 SYSTEM SETUP 6-3	
OFFLINE displays During RUN M	Mode 7-8	Т	
ONLINE ERror Display 6-32 Optional Maintenance Items Options 1-6, 1-7 Output Circuit 2-9 Overlapping Addresses 7-21	1-7	TOOL CONNECTOR 7-5 Tool Connector 1-5, 3-10, 3-11, 3-14 TOUCH BUZZER SOUND 6-3 TOUCH OPERATION MODE 6-15 TOUCH PANEL 7-4 Touch Panel / Clock Accuracy 2-5, 2-6	
PARITY 6-10, 6-20, 6-23 PASSWORD SETUP(0-9999) 6 Periodic Check Points 8-3	6-3, 6-4	Touch Panel Does Not Respond 7-8, 7-14, 7-15, 7-16 Troubleshooting 7-8 Turning the GP's Power ON 5-1	
Placement of I/O Signal Lines 3 PLC PRIORITY 6-27	3-9	U	
PLC SETUP 6-24			
Possible Types of Trouble	7-8	USE TOUCH PANEL AFTER BACKLIGHT BURNOUT 6-17	
R		V	
REGISTRATION NO. (1-256) 6 Regular Cleaning 8-1	6-6	Validation List 6-26	
RESET GP ON WRITE ERROR	6-24	W	
RETRY COUNT 6-18		WARNINGS 3-6, 3-10, 8-4	
S		WINDOW LOCATION 6-6 Wiring Cautions 3-6	
	7-4		
Safty Precautions 6			
Screen Data or Project Data Rela			
SELF-DIAGNOSIS 7-3	7-20		
SELF-DIAGNOSIS-tandard Oper	ration 5-6		
Serial I/F Change Error 7-25	ation 5-0		
Serial Interface 1-5, 2-7, 2-8			
SET UP I/O 6-10			
SET UP SCREEN 6-2, 6-32			
SET UP TIME 6-31			
SET UP TOUCH PANEL 6-15			
SIO CHECK 7-6			
STAND-BY MODE TIME (0-255)	6-3		
START TIME (0-255) 6-3			
STATION NO. (0-15) 6-26			

Steps to run SYSTEM RESET 6-13, 6-15