Introduction

Outline

Introduction Outline

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Intro.1

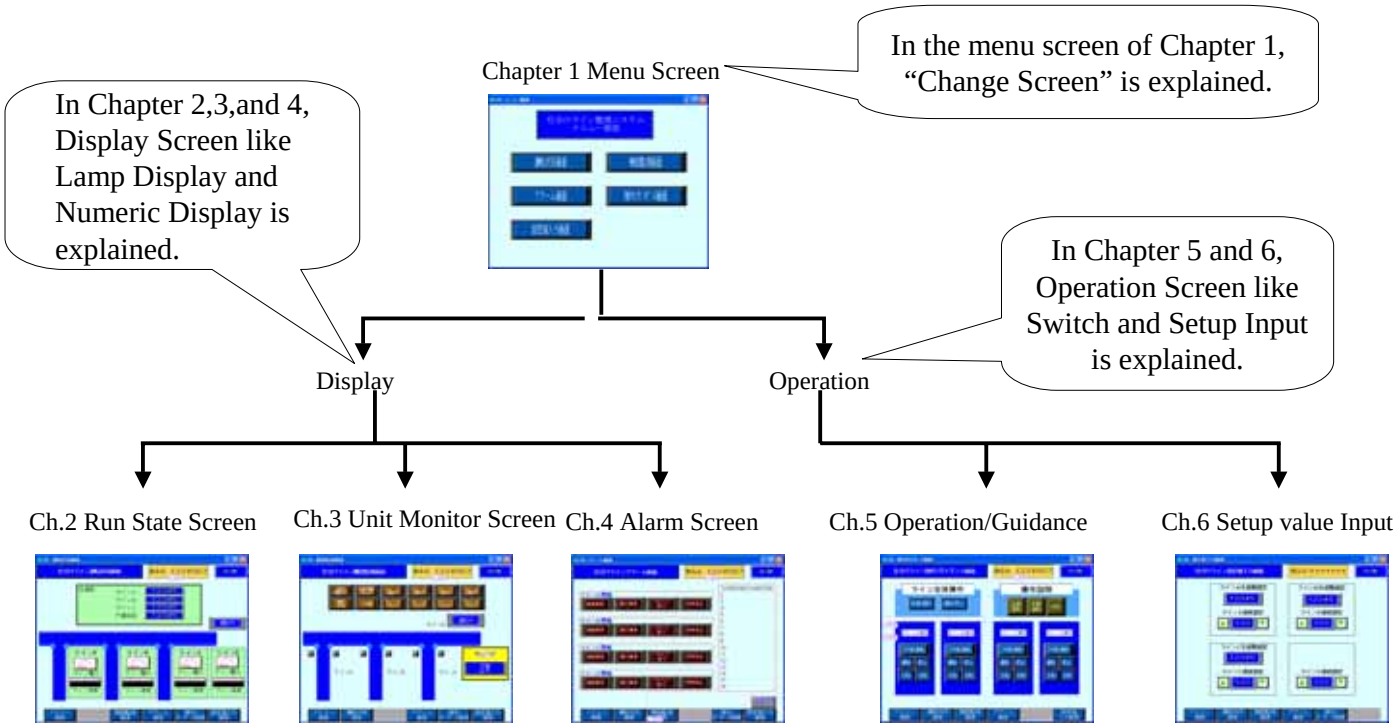
How to use this textbook

Here it will be described how to use this textbook.

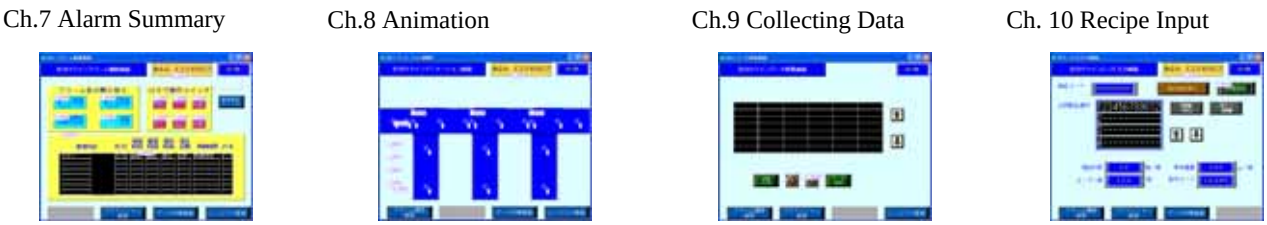
Outline

For “What customers wish to do(use)”, this textbook consists of 10 screens (basic, advanced) using frequently used functions on the basis of inquiry summaries of Support Call Center or screens that customers actually created. The parts/tags consisting of each screen are explained and the specific setting methods are described using examples.

[Basic] * Set [B1] for an initial screen number.

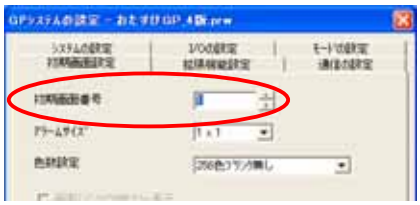


[Advanced] *Set [B11] for an initial screen number.



Point

• For the initial screen number, click [GP Setup] of [Project Manager] and then set it in [Initial Base Screen Number] of [Initial Screen Settings].

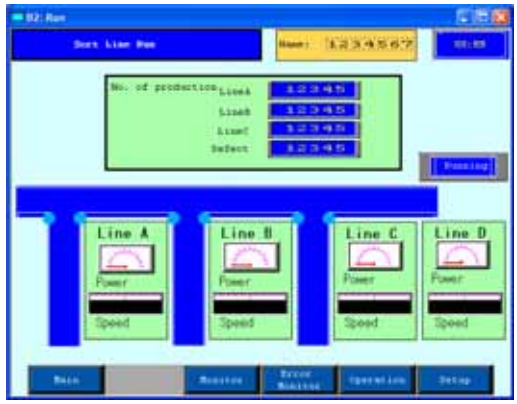


*In transferring screen data, Check [GP system settings] and transfer data. (For details, refer to Intro.-24)

[Details of Basic (Display) Screen]

Chapter 2 Run Screen (B2)

This is the screen monitoring the Run State of the unit. The display of the word data is explained. The settings of the Numeric Display that displays time, the number of the production, the speed etc. with values, the Graph/Meter Display and the Character Display that displays the product names etc. are explained.



Chapter 3 Unit Monitor Screen (B3)

This is the screen monitoring the Unit State of the unit.
The bit information like Sensor is displayed.
The Lamp Display and the Message Display are explained.

Chapter 4 Alarm Screen (B4)

This is the screen monitoring the Error State of the unit.
The error display of the lamp, the display of the alarm message list and the scrolling banner that is displayed at the bottom of the screen are explained.

[Details of Basic (Operation) Screen]

Chapter 5 Unit Operation/Guidance Screen (B5)

This is the screen for the Run Operation of the unit.
This screen explains the switches that display the guidance (window) for the descriptions of the switches/the operations for “Run”.
The way of creating momentary switches and ON/OFF switches is explained.

Chapter 6 Setup Value Input Screen (B6)

This is the screen for inputting the setup values and the product names of the unit.
Here are explanations of how to increase/decrease the setup values with Increment/Decrement SW, how to input the values via the ten key, and how to input the characters via the keyboard.

[Details of Advanced Screen]

Chapter 7 Alarm Summary Screen (B11)

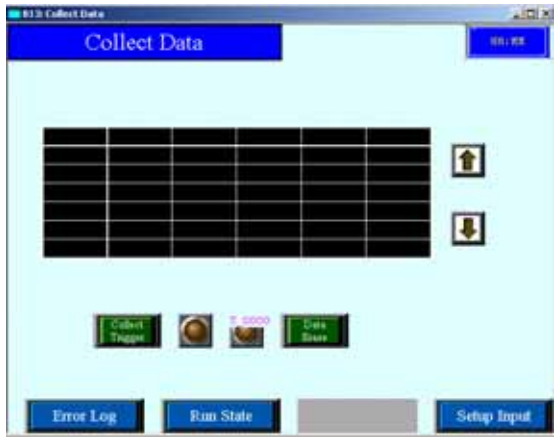
Summaries of alarm occurrence state of the unit are saved and displayed.
Registering alarm messages, display settings, and how to display alarm details and recovery methods as a Sub Screen are described.

Chapter 8 Animation Screen (B12)

This screen displays the run state of the unit by using Animation simply.
According to data changes of the connected devices, it is described how to display the places through which the object moves and the working state.

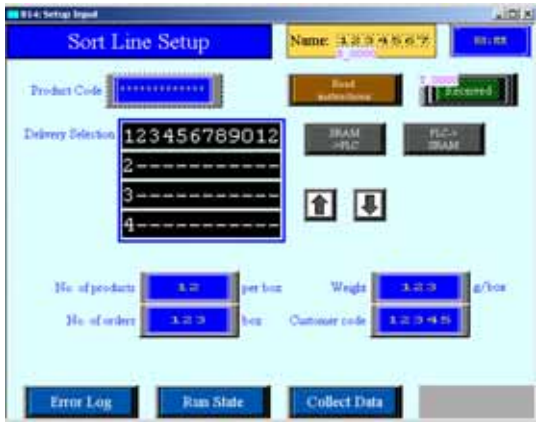
Chapter 9 Collect Data Screen (B13)

This is the screen that collects the unit's data to GP at the designated timing. It is described how to save and display PLC's data in the display unit at the timing of touching the switch on the screen.



Chapter 10 Recipe Input Screen（B14）

It’s possible to transfer the already registered data group to the unit when needed.
The way to register the data group to transfer and make transfer settings is described.



Intro. 2

Drawing Software

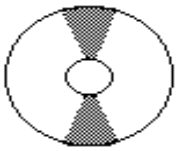
Here, GP drawing software and a flow of drawing will be explained.

Software and Developmental Surroundings

(1) Software

In order to create a screen of a display (GP), software called [GP-PRO/PBIII] is required.
Currently sold software is [C-Package] that combines [GP-PRO/PBIII] and [Pro-control Editor].
The [Pro-control Editor] is software to create logic of GLC/LT. It's not used for creating GP's screens.

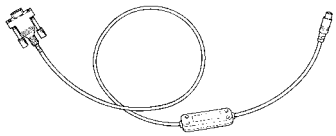
(2) What's required at development



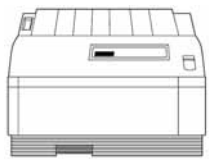
GP-PRO/PB**III**
C-Package03

Windows PC
(For operational surroundings, see below)

GP(GLC)2000 series *1



Transfer Cable *1
GPW-CB02（Serial）/GPW-CB03（USB）



Printer *2
(If necessary,)

*1 GLC has a Control Function in addition to GP's Display Function.
(For details, refer to Otasuke GLC)

*2 Possible to transfer data via an Ethernet Cable or a CF card as well.
On GP's side, an Ethernet I/F or a CF card I/F is required.

*3 For Print from GP, a Printer Cable is required. Connectable types are limited. Refer to the catalog etc.

(3) Operational Surroundings of the software

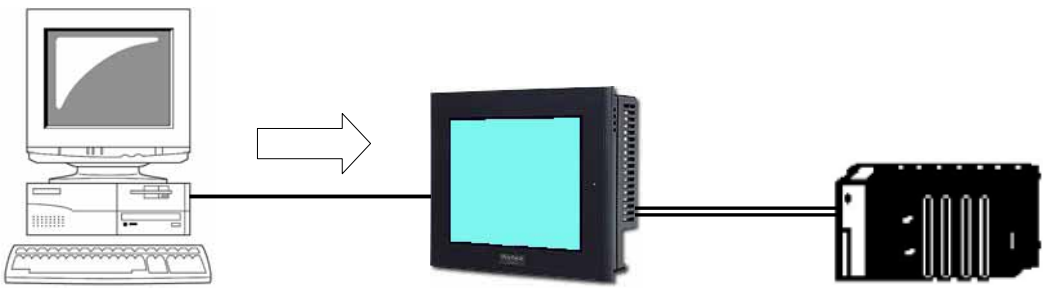
Form	GPPRO-CNT01W-P03	
PC	Type that can have Windows operate correctly	Pentium® II 266MHz or more is recommended. Can operate with PC/AT Compatible
No. of Display Dots	SVGA 800×600 or more recommended	
Hard Disk Space	Max. 210M bytes	Vacant volume after installation More than 3 times as large as a project file size
Memory	32M bytes or more	64M bytes or more recommended
Disk Drive	CD-ROM drive is required	
OS	Windows®95	
	Windows®98	
	WindowsNT®Ver4.0 or more	Service Pack3 or more
	Windows®2000	
	Windows®Me	
	Windows®XP	

* For PC, a COM port or a USB port/Ethernet port is required.

Point

Basis of Development of Display Screen

Transferring the project file created in the PC to the display allows the display to communicate with the PLC and therefore it's possible to display and operate the PLC data.



* A project file can be created by using the software. When saving the data created via the software on the PC, [.prw] is put as an extension.
Think like Project File = [A mass of data to be transferred to the display].

Procedures of drawing

(1) Starting the software

Double-click the icon on the screen (when a short-cut icon has been created) or go to [Start] of Windows -> [Program]->[Pro-face]->[C-Package03] and then select [Project Manager] in order to start the GP software. When starting it, the first started screen is called “Project Manager”.

Click the icon, and the software will start and Project Manager will display.

Project Manager

(2)The flow from creating a new project file to transferring it

1.Start Project Manager

2.Set GP Type and Connected Unit.

3.Draw objects on Screen Editor

4. Enter a file name and save it.

5. Transfer the screen.

6. Completed

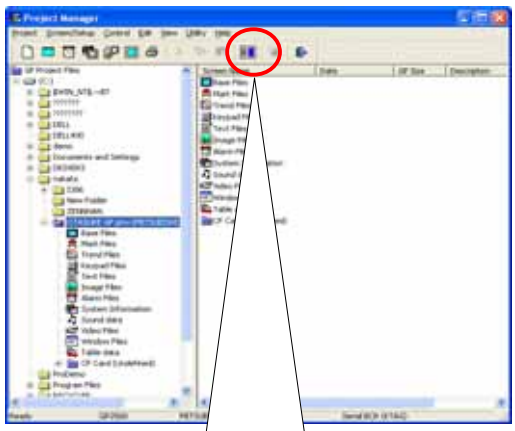
Point

• **There are 2 kinds of displays as shown below by clicking “Change Project Manager”**

Normal Display

Click here, and it will be changed to Hierarchy Display.

Hierarchy Display



Click here, and it will be changed to the normal Project Manager display.

• **Difference of each Project Manager**

In a normal display, only one project is treated. But in a hierarchy display, like Explorer of Windows, plural project files in the PC can be seen in a list. Also a list of base screen can be seen and it’s possible to copy a base screen from the file, [A.prw] to [B.prw]. Therefore the edit is easy.
(However it’s impossible to open plural screen editors.)

(3) Explanations of the menu bar and each icon

①

Project: Makes settings concerning a whole project file

Screen/Setup: Does Drawing/Edit, Alarm Message Setting, and Application function settings

Control: Used when creating a GLC logic

Utility: Possible to select a tool like a grouping conversion of addresses and screen numbers and a list display of used addresses. Possible to convert Image (BMP, JPG) and CAD files (DXF type) for use in GP.

②

GP Setup: Sets an operational environment of a display unit. (Also possible to set it from an Offline Screen of a display unit)

* For details, refer to [Intro. 14].

③

Project: Selects a new or an existing project file.

Editor: [Screen] creates GP screens.
[Alarm] registers alarm messages.
[Print] makes print settings.

Transfer: [Transfer] transfers a project file to GP.
[Simulation] checks an operation between GP and Drawing Software.

④

: Changes a GP type

: Changes a Connected Unit

: Changes Expansion SIO Settings

Caution

- When the connected unit is changed, be sure to check the setup addresses.

How to create a project file

(1) Create a new project file

① Click on New

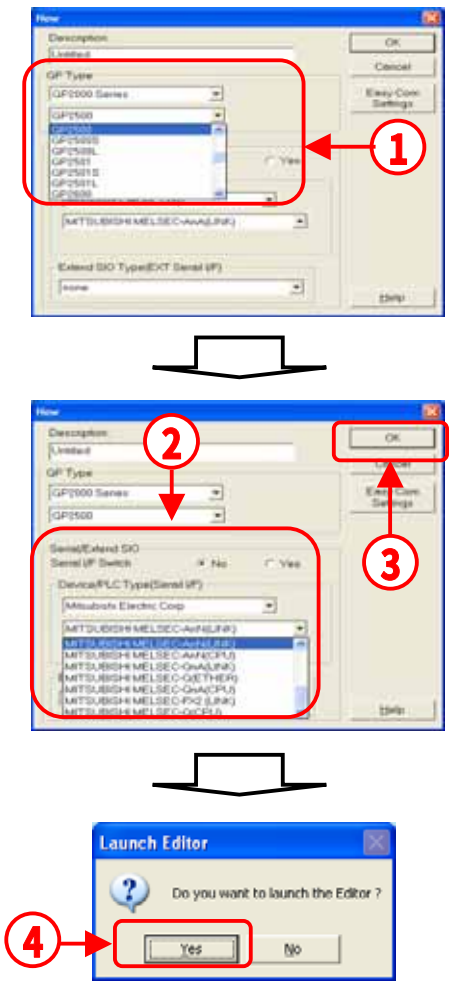
(2) Select GP Type and Device Type

① Select GP Type.

② Select a connected device.

③ After setting each, click [OK].

④ Click [OK].



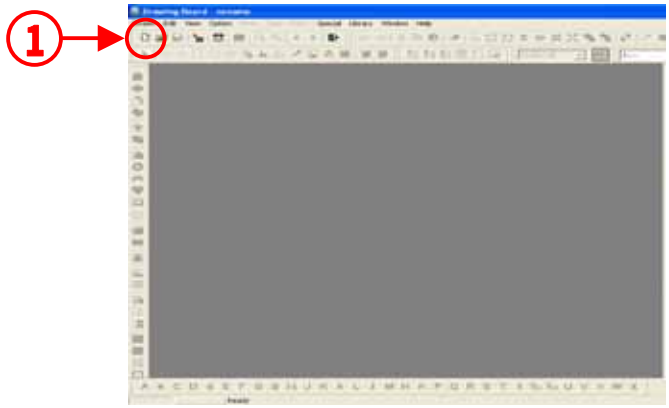
Caution

• Be sure to select a GP type that suits the display to create screens and a device type that suits the device to actually communicate with. If you transfer data with an incorrect type set, an error will be displayed.

(3) Open a new screen.

① Click the [New] icon.

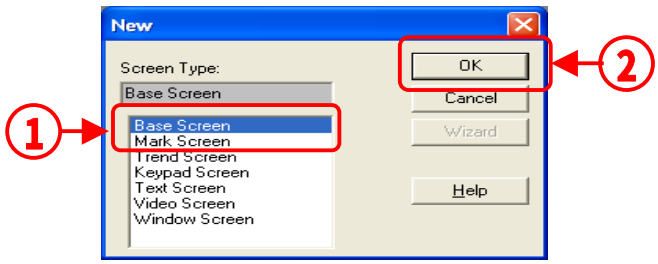
* Possible to select [New] from [Screen] on the menu bar.



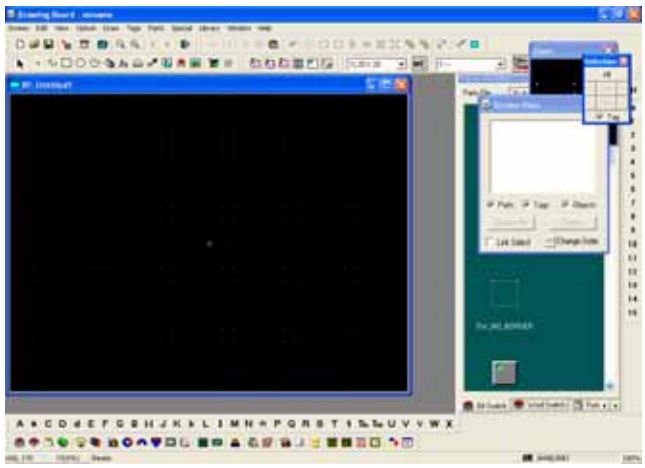
(4) Select a base screen.

① Select [Base Screen].

② Click [OK].



A new base screen is now open.



Point

For actually creating a screen, refer to Chapter 1 and after.

GP System Settings

(1) How to set GP System

① Click the [GP Setup] icon.

*It's also possible to select [GP Setup] from [Screen/Setup] in the menu bar.

(2) What's GP System?

It's a GP's operational surroundings setting. Make the following settings.

1. Initial Screen
Initial Screen No. (the number of the screen displayed at first when GP starts.), No. of Colors Setting etc.

2. System Settings
Password Setting, Check Sum, ON/OFF of Buzzer Sound etc.

3. I/O Settings
Contrast of Display, Brightness Adjustment, Reverse Display, Connected Printer Type etc.

4. Extended Function Settings
Watch Dog Setting, CF Card Setting, Alarm Summary Setting, Windows/Video Setting, System Area Setting etc.

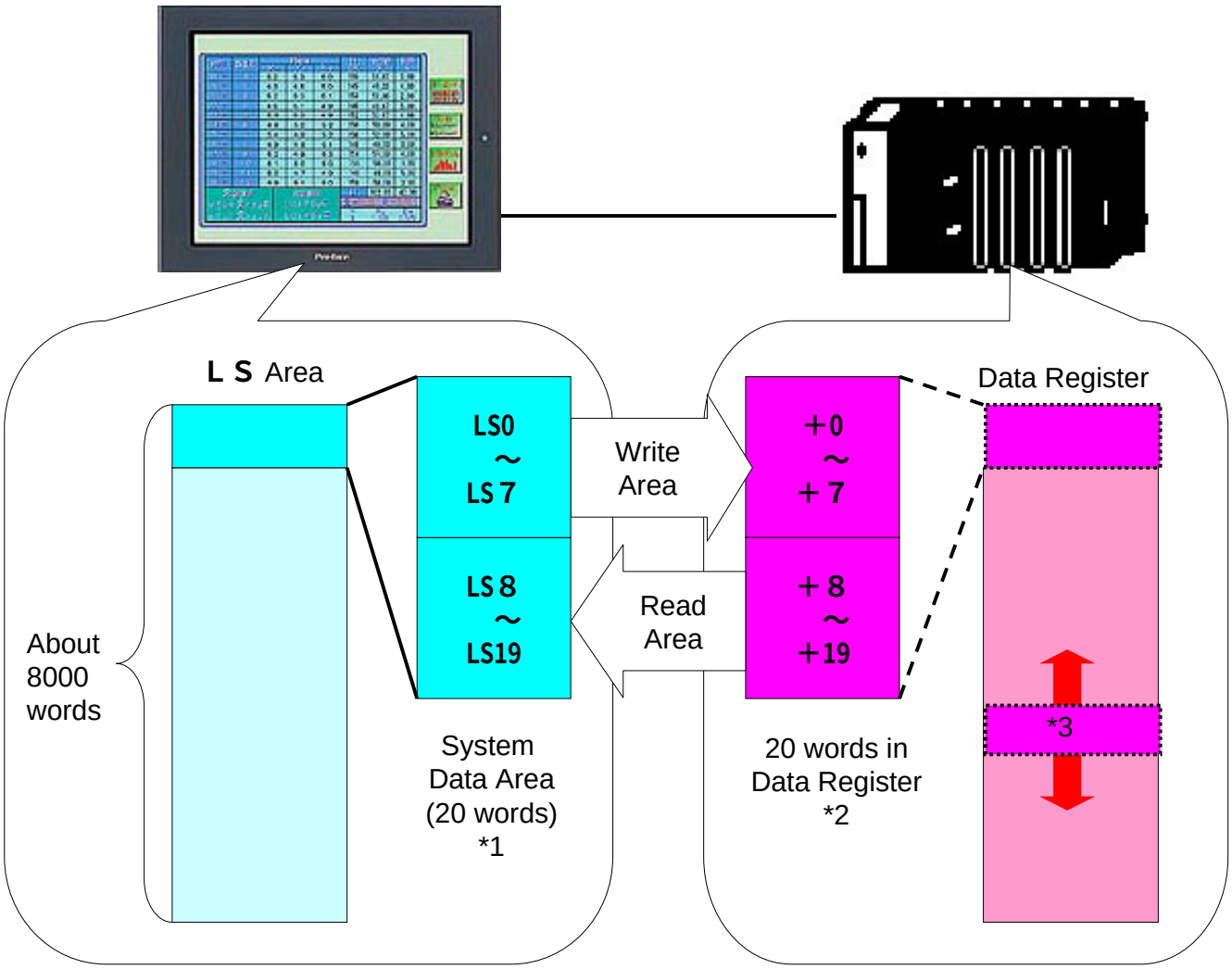
5. Mode Settings
System Start Address Setting, PLC Link Unit No. Setting etc.

6. Communication Settings
PLC Connection Method Setting, PLC Communication Setting
* GP's communication setting is the one of Default of PLC set for a connected device. Therefore, if the PLC side has Default values, no change will be necessary.

Point
System Settings are possible via Offline of a GP (except a certain setting)
*For how to enter Offline, refer to GP2000 series users manual.

(3) System Data Area

GP has an internal area called LS Area. The 20 words from the start of this LS Area are called System Data Area.
The System Data Area treats GP's system (For the details, refer to [Intro.16 -]) and each address decides each action. The System Data Area can occupy the data register of PLC and occupying it allows you to check/operate GP's system from the PLC side.
(Ex.: Change Screen from the PLC side, ON/OFF of the Backlight, Time Data correction, Buzzer Sound, etc.)



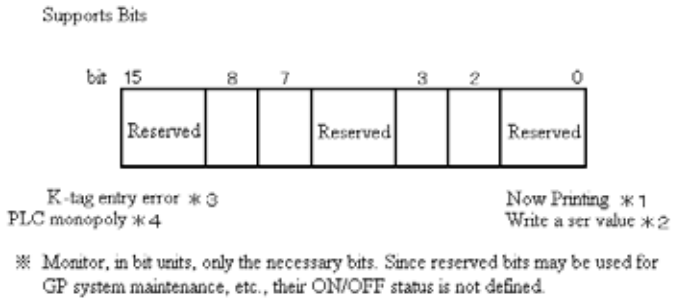
*1 For action of each address, see the next page.

*2 In the 20 words, only required parts can be assigned to the PLC. The parts that are not used are closed up.

*3 The [System Area Start Address] can be optionally set. But at default, it's assigned to the start address (00) of the data register. (For details, refer to Intro.-20)

(4) Action of each address in the system data area

<Area for Write only>
Writes GP's information to PLC. Possible to inform PLC of GP's state.

	Word Address	Details	Bit	Remarks
GP ↓ PLC Write only	+0	Displayed screen number	1to 8999 (however, in the case of BCD, 1 to 1999)	
	+1	Error Status Changes according to GP's error state. The bit turns ON when errors occur. Power Supply; ON->OFF->ON, then the bit is cleared.	0,1	Not used
			2	System ROM/RAM
			3	Screen Memory Check Sum
			4	SIO Framing
			5	SIO Parity
			6	SIO Over-run
			7,8	Not used
			9	Memory requires Initialization
			10	Timer Clock Error
			11	PLC Communication error
			12 to 15	Not used
	+2	Current value of Clock, [Year] BCD 2 digits	Last 2 digits	
	+3	Current value of Clock, [Month] BCD 2 digits	01 to 12 (month)	
	+4	Current value of Clock, [Day] BCD 2 digits	01 to 31 (date)	
	+5	Current value of Clock, [hour, minute] BCD 4 digits	00 to 23 hr, 00 to 59 min	
	+6	Status		
	+7	Reserve		

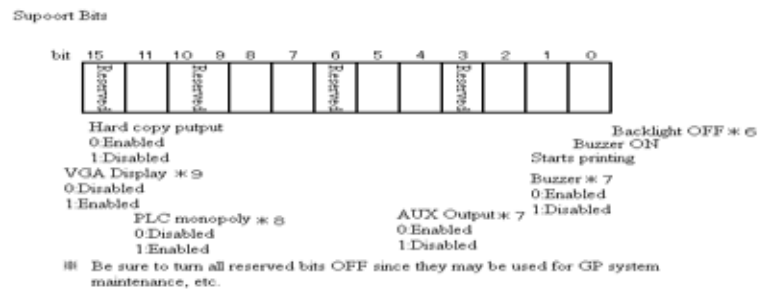
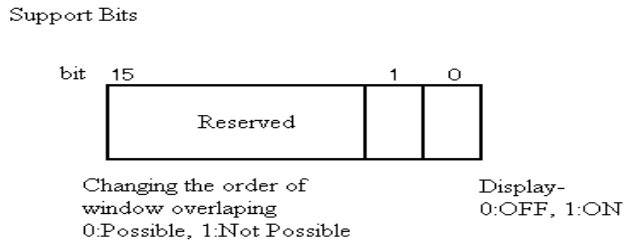
*1 This bit turns on during printing. Changing to OFFLINE mode while this bit is ON can scramble the print output.

*2 Every time a value is written with the K-tag or Keypad Input Display, the bit is reversed.

*3 When an alarm is setup in the middle of K-tag input, and a value outside the alarm range is entered, the bit turns ON. When you enter a value within the alarm range, or a screen change takes place, the bit turns OFF.

*4 When using Multi-link, the bit turns ON in the middle of PLC Monopolize.

<Area for READ only>
GP reads PLC's information. It's possible to control GP's operation form the PLC side.

	Word Address	Details	Remarks
↓ READ only	+8	Change Screen Number	1 to 8999 (However, 1 to 1999 when using BCD input)
	+9	Screen Display On/Off	FFFFh:Screen clears almost immediately. 0h:Screen turns ON.
	+10	Clock's YEAR set value, BCD 2 digits (+flag)	Last 2 digits (bit#15 is the clock's data write change flag) *5
	+11	Clock's MONTH set value, BCD 2 digits	01 to 12 (month)
	+12	Clock's DATE set value, BCD 2 digits	01 to 31 (day)
	+13	Clock's TIME set value, BCD 4 digits	00 to 23 hr, 00 to 59 min.
	+14	Control	
	+15	Reserve	Set to 0
	+16	Window Control *10	
	+17	Window Registration Number *10	Global Window registration number selected by Indirect setup (Bin/BCD)
	+18	Window Display Position (X coordinate data) *10	Global Window display coordinates selected by Indirect setup (Bin/BCD)
	+19	Window Display Position (Y coordinate data) *10	

*5 The clock data is rewritten when the data write flag changes (OFF->ON or ON->OFF).

*6 In the case of GP-570, GP-270, GP-370, ON-> the backlight is OFF. (LED display remains), OFF-> the backlight is ON.

*7 Control Bit 1 (Buzzer On) is output as shown below.
Buzzer output • • • When control bit 1 is ON, the GP internal buzzer is activated.
AUX output • • • When control bit 1 is ON, the AUX buzzer output is ON.

*8 When using n:1 (multi link), ON-> PLC is monopolized.

*9 In the case of GP570VM, GP870VM, ON-> the whole screen is VGA display. If you touch an optional position on the screen during VGA display, OFF.

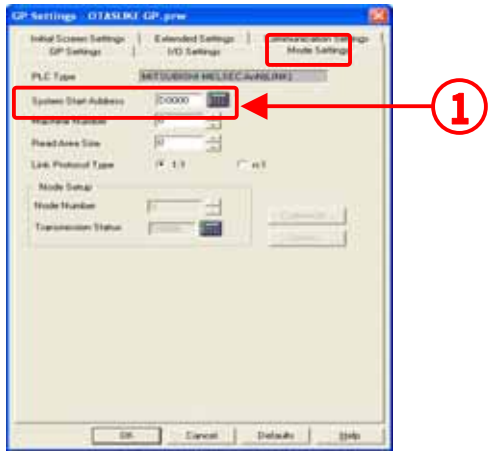
*10 Used when Global Window is set.

(5) System Data Area Setting (System Setting)

①

[Start Address Setup]

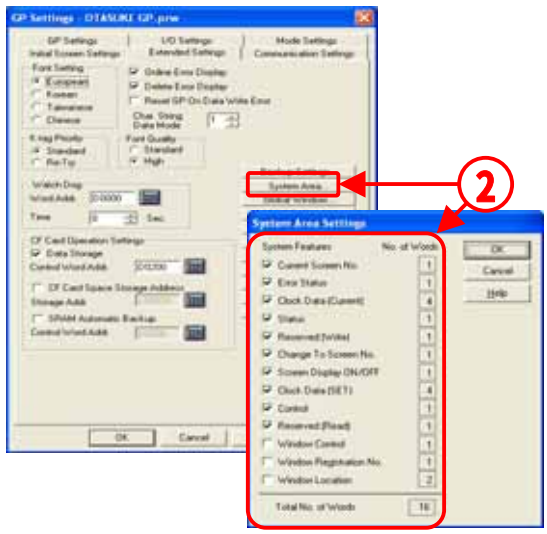
In [System Start Address] of [Mode Settings], enter the start address of the system data area to assign to PLC.



②

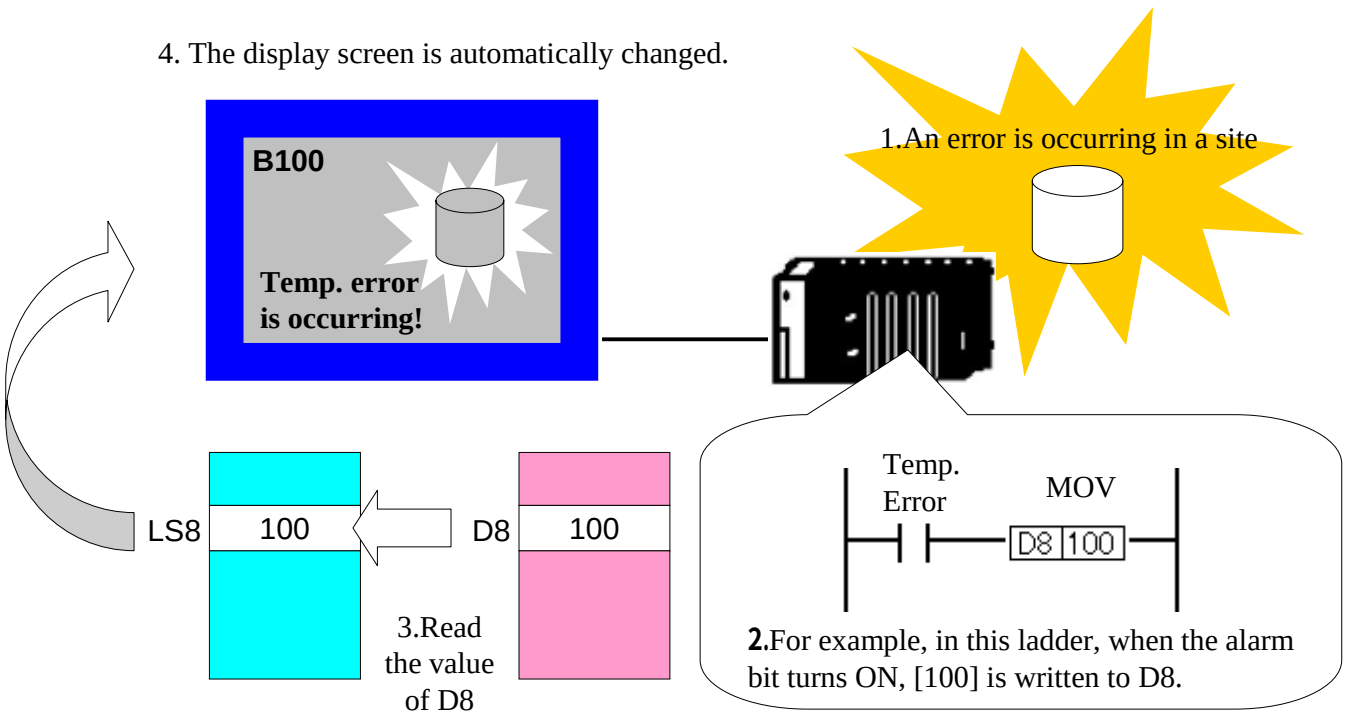
[Assigned item settings]

In [System Area…] of [Extended Settings], set the system data area items to assign to PLC.



(6) Example of using the system data area

Ex: Automatic Change Screen (Use [LS8] of the system data area)
When an error occurs in a site, the screen is changed to the already prepared alarm screen.



Communication method and communication error

(1) Communication method

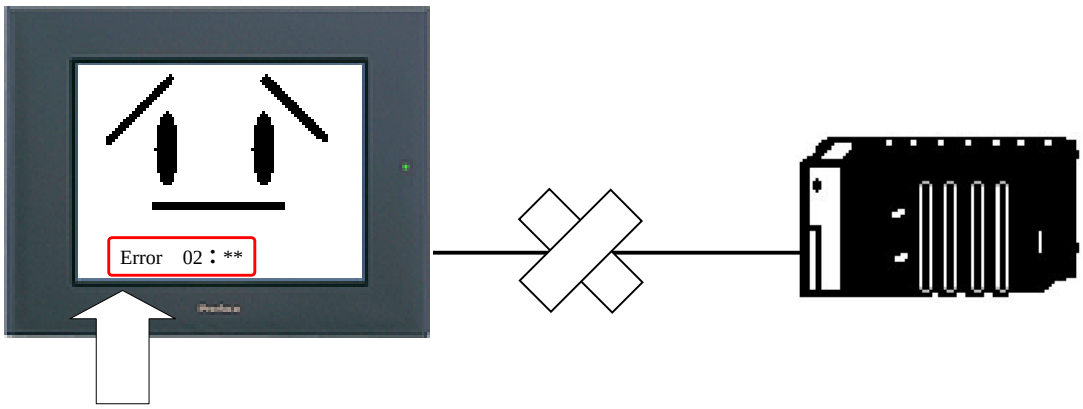
For GP and PLC communication method,communication via a serial cable (RS232C, RS422) is common, but there are also Ethernet high speed communication, other communications via each kind of open network (a separate extended unit is required.).

*For the detailed communication method, refer to [Unit Connection Manual].

(2) Communication errors

When communication errors occur,the error code, [02:**] appears at lower left of GP's screen. Error descriptions vary depending on an error code. In [**], an error code of PLC is displayed.

An error occurred…



Here, the error code is displayed.

• Frequently asked error codes are shown below.

Ex.) When [02:FE], [02:FF], or [02:FD] is displayed, the error is saying that PLC doesn't respond to GP's command or no command can be sent to PLC.

(Remedies)

1. Check if the connected device set in GP matches the connected PLC.
2. Check if communication settings of GP and PLC agree.
3. Check that the communication cable connections of GP and PLC are correct and they are not cut.
4. Check that it's not the environment where noise can ride on the communication cable of GP and PLC easily.

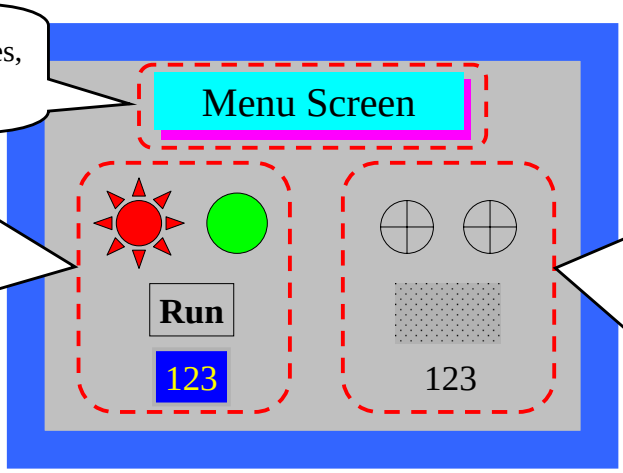
Drawing/Parts/Tag

(1) Drawing/Parts/Tag

In order to place pictures and functions on GP, make the settings using Drawing, Parts, and Tags.

[Drawing]:pictures like lines, squares, circles, text

[Parts]: complex of [animation function + pictures] like switches, lamps, numeric displays etc.
Easy and speedy drawing is possible.



[Tag]: Animation Function like Touch and load function, Library display function, Numeric display function.
It doesn't have background and frame pictures basically, and can set applied animation functions.

Animation Function is the function that reads and writes device addresses. (updates the display according to data movement, writes data etc.)

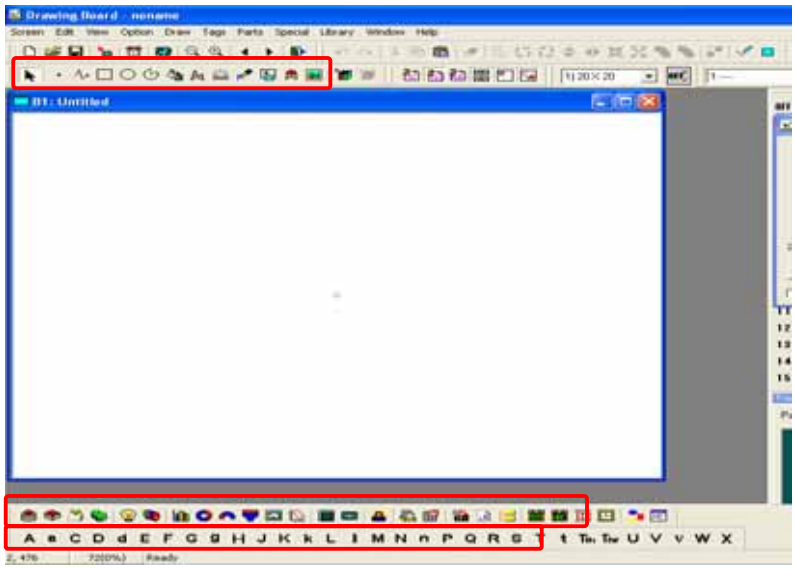
(2) How to select each function

The tool bar positions of drawing/parts/tags at default are as shown below. They can be selected from the menu bar.

Drawing Tool Bar

Tag Tool Bar

Parts Tool Bar



Point

• In this textbook, we will have drawing exercises using frequently used parts and tags from Chapter 1. Those who draw for the first time are recommended to draw using parts mainly. When adding applied animation functions on the screen, please use tags.
For details of each function of drawing and parts, refer to Operation Manual. For details of each function of tags, refer to Tag Reference Manual.

Transfer Screens

(1) How to transfer screens

For transferring screens to GP, there are three kinds of methods like Transfer Cable, Ethernet, and CF Card.

1. Transfer Cable

- Transfer cables for use
  Digital: GPW-CB02（GP's side:Circle 8 Pin, PC's side:D-sub9 Pin）
  Digital: GPW-CB03（GP's side:Circle 8 Pin, PC's side: USB）

2. Ethernet

- Ethernet cables for use (commercial)
  When connecting a GP to a PC directly: Cross Cable
  When transferring data via HUB: Straight Cable
  *An Ethernet I/F is required on a GP's side.

3. CF Card

- CF Card for use
  Digital: CA3-CFCALL64/128/256/512MB-01(64/128/256/512MB)
  *Operations using other companies' products are not guaranteed.

(2)Transfer screens

① Click the [Transfer] icon.

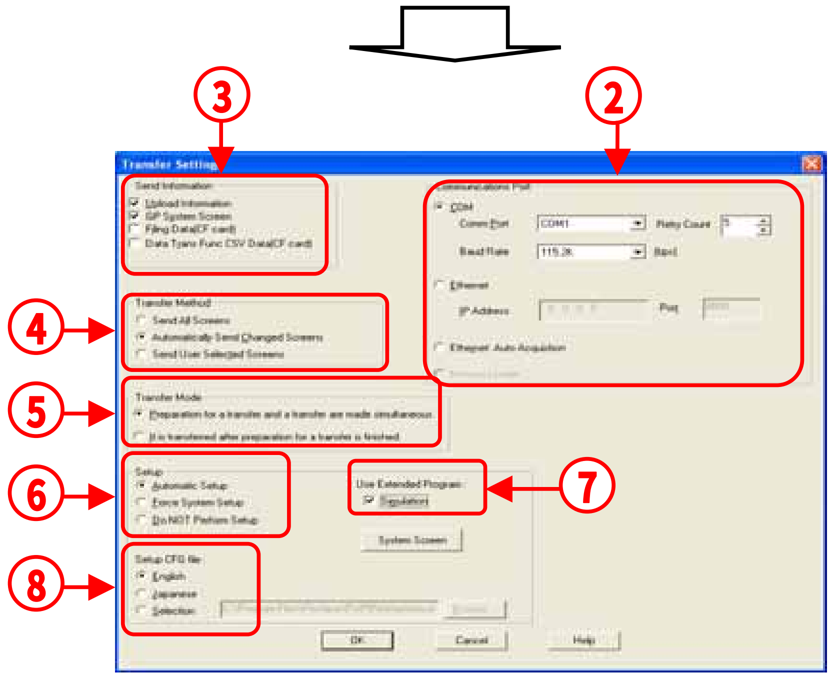
*Selected from the menu. Also selected from Editor.

*When transferring screen data, it's necessary to save the screen data.

(3)Transfer Settings

① Click the [Transfer Settings] icon.

*Possible to select it from the [Transfer Settings] from [Setup] of the menu bar.



②

When transferring data via the data transfer cable, set [COM]. When via Ethernet, set [Ethernet], [Ethernet:Auto Acquisition].

*In the case of Ethernet Transfer, it's necessary to set IP Address and Subnet Mask to GP in advance.

③

Upload Information: If you transfer data without check, the data cannot be downloaded from the GP to the PC.

GP System Screen: Sends the GP system set via the drawing soft.

④

Send All Screens: Transfers all screen data.

Automatically Send Changed Screens: The transfer program automatically sorts out screens and transfers the changed screens only. However, it's necessary to send the same project file to the GP beforehand.

Send User Selected Screens: Designates screens to transfer directly and transfers them. However, it's necessary to send the same project file to the GP beforehand.

⑤

Preparation for a transfer and a transfer are made simultaneous: Since preparation for a transfer and a transfer are made simultaneously, a transfer at high speed is possible. When an error occurs after the GP is initialized due to transferring all screens etc., the GP might have the initialized condition.

It is transferred after preparation for a transfer is finished.: Checks that no error occurs after preparation for a transfer is finished and then transfers data.

⑥

Automatic Setup: Setup according to the GP's condition at destination

Force System Setup: Setup every transfer

Do Not Perform Setup: No setup

⑦

Designates whether the protocol for Simulation only is transferred or not

⑧

Selects the setting file for setup. No needs changing normally.

If you select English and perform Setup, the screen of Offline becomes in English.

(4) Send screen data to the GP

①

Click the [Send Screens] icon from the tool bar.

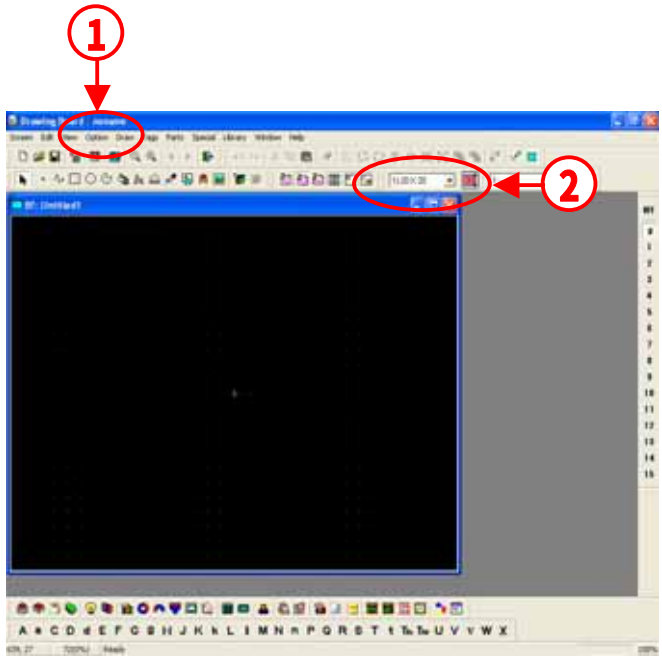
*Possible to select [Transfer Settings] from [Setup] of the menu bar.

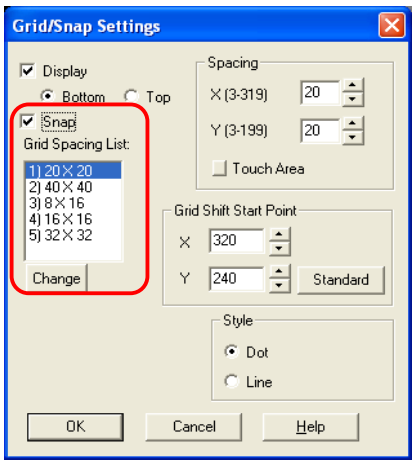
Grid/Snap Settings

(1) Grid Settings

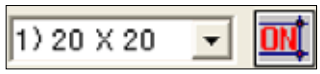
The points displayed at an equal interval on the base screen are called grid points.
The grid points should be referred for coordinates in drawing.

① Click the [Grid/Snap] from [Option] on the menu bar. Check [Snap], and Snap will be enabled.





②



The currently set grid pattern is displayed. Click , and the grid pattern will be changed.

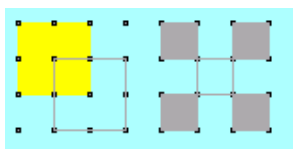
And every time you click ON , Enable/Disable of Snap will change.

(2) Snap Function Settings

If Snap Function is enabled, the cursor position is determined according to the grid points and it's convenient when drawing straight lines and placing Objects such as switches * . Click [Snap ON/OFF].(Refer to the upper-right figure).

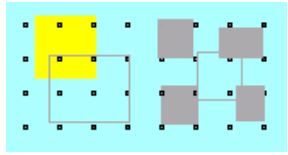
*Objects mean drawings, parts, tags to place on a screen.

Snap ON



When drawing squares/rectangles,the vertexes catch the grid points and therefore Objects can be placed in order.

Snap OFF



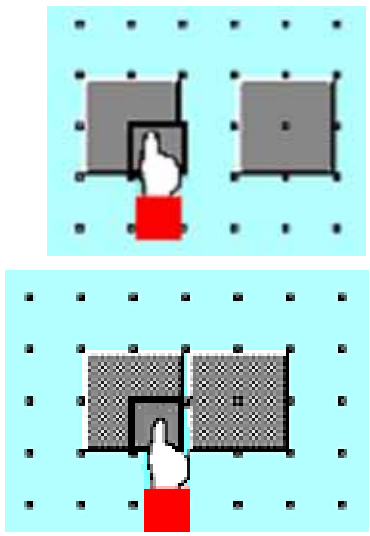
The grid points are ignored and the placement is disorder.

Point

Note for placing switches

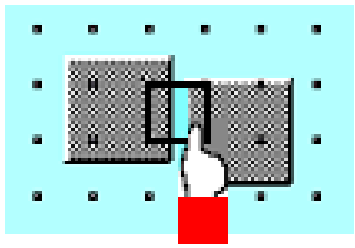
One touch area of the Touch Panel has 20x20 dots. This is called touch panel grid. The number of touch panel grids is 32 x 24 = 768 in GP2500 (No. of display dots:640×480).
When two switches share one touch panel grid, an incorrect operation might be caused.
For example, the undesired switch responds.

Ex.1: Correct Placement (OK)



Since the 2 switches don't share the matrix, there's no problem.

Ex.2: Incorrect Placement (NG)



The 2 switches share the matrix. Be careful not to make such a placement.

To avoid the placement as shown in the Ex.2, use Grid/Snap function.
Set [20X20] for the grid and Enabled for the snap, and you will be able to place plural switches easily so that they don't share one matrix.

Load Screen

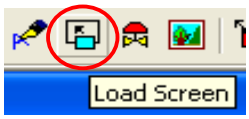
Using Load Screen enables you to load the object setup in another screen into the current screen.
It's convenient when displaying the same switch/lamp in plural screens.
If you edit the object at source for Call, all objects at destination will be edited and therefore you can save work for revision.

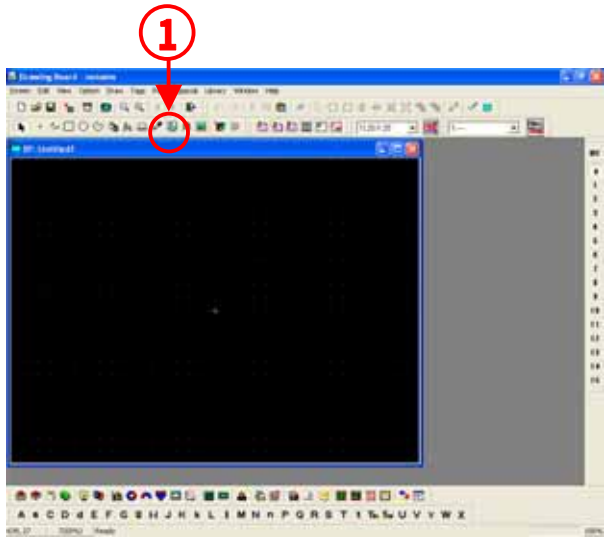
* Object means drawings/parts/tags placed on a screen.

(1) How to select Load Screen

First keep the screen at destination open.

① Click the [Load Screen]icon.

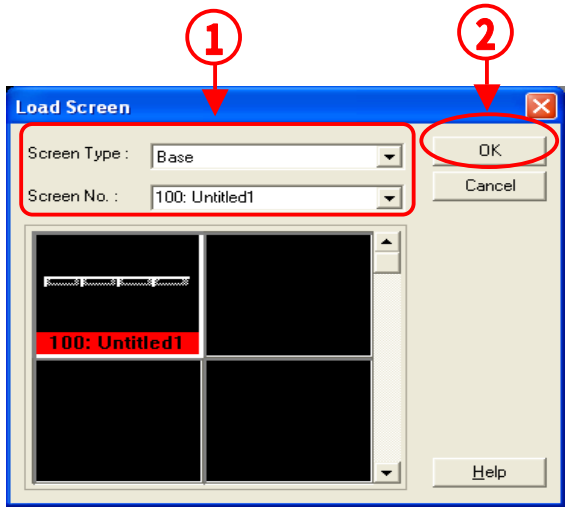




(2) Load Screen Settings

① Select Screen Type and Screen No. at source.

② Select the screen at destination and click [OK] for placement.



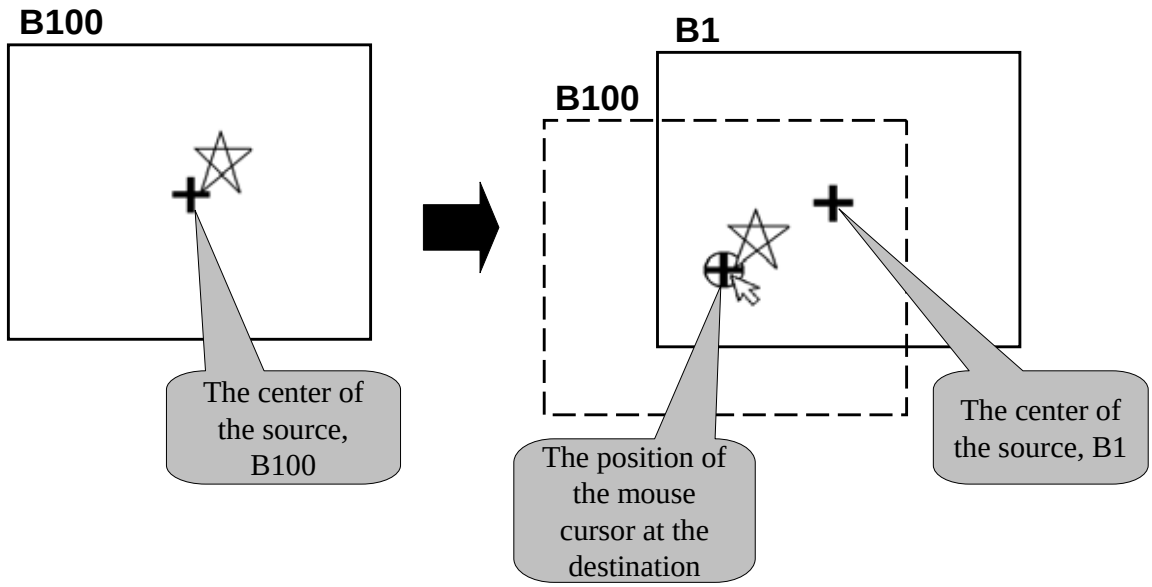
Point

• If you load the same object in plural screens, the size of the whole project can be smaller than in the case of Copy and Paste.

Point

- **Load Screen Position**

Ex.: When loading the object in [B100] to [B1], the center of the coordinates on the source, [B100] is the position of the mouse cursor on the destination, [B1].



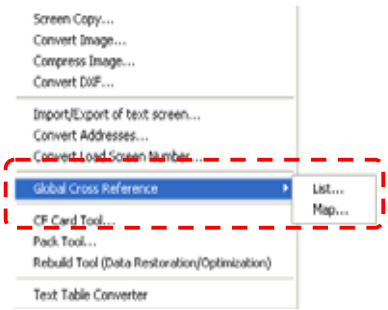
Global Cross Reference

Using Global Cross Reference enables you to see all addresses used in a project file in a list.
There are 2 kinds of display methods, List Display and Map Display.

(1) How to select Global Cross Reference

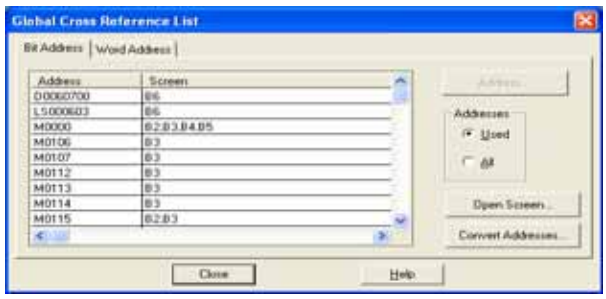
Open the project manager.

① Click [Global Cross Reference] from [Utility] in the menu bar. [List] or [Map] can be selected for a display method.



• List

With List, it's possible to display in a list which screen bits/addresses are used in.



• Map

With Map,a lattice screen is displayed for every bit/address and the addresses used in the project are filled in green and displayed.
The state of using consecutive/non-consecutive addresses can be checked at a glance.

How to print a project

It’s possible to print a drawn screen or tag setup state and save it in a [.RTF] file.

(1) How to select Load Screen

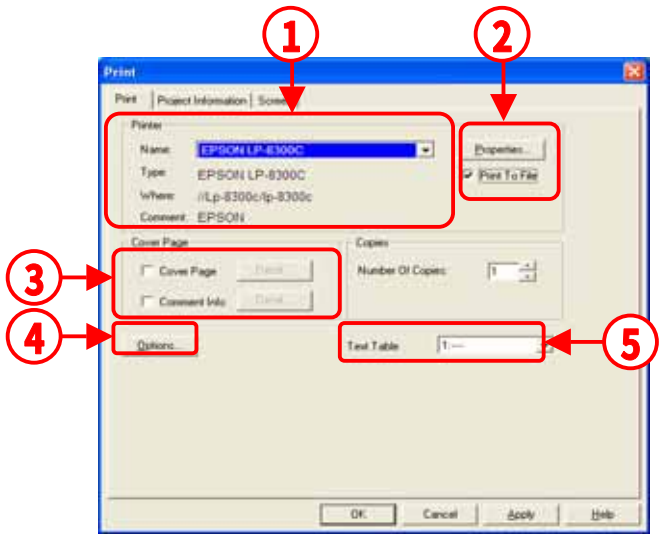
Open Project Manager.

① ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

Click the [Print] icon.

(2) Print Settings

Select the [Print] tab.



① ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

Select the printer to use.

② ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

Properties : Set the printer

Print to File: Check here to save in a TF file.

③ ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

Set Yes/No of Cover/Comment. Set attributes of Cover/Comment in Detail.

④ ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

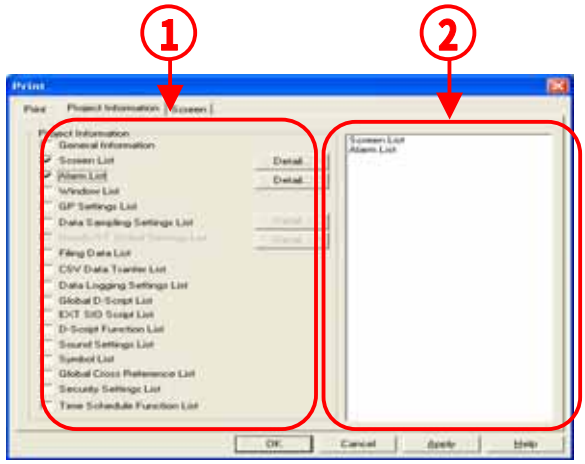
Set Black & White reverse/Page No./Margins

⑤ ― ― ― ― ― ― ― ― ― ― ― ― ― ― ― ―

Select Text Table for the time of print.

(3) Project Information Settings

Select the [Project Information] tab.

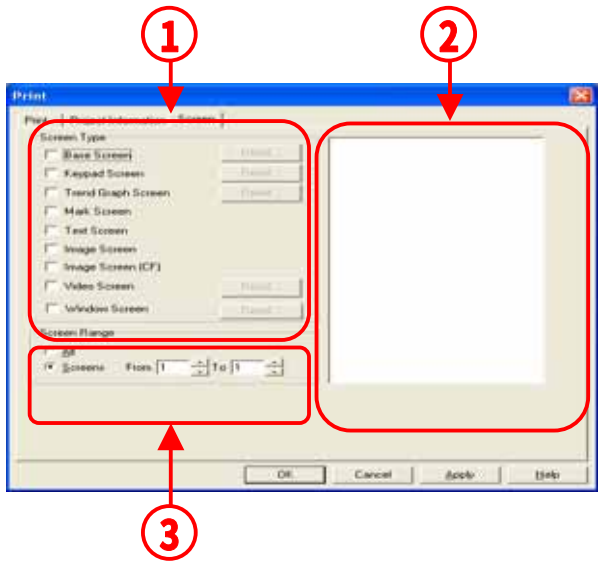


① Set the drawn screen or tag setup state to print.

② The currently selected attributes are displayed.

(4) Screen Settings

Select the [Screen] tab.



① Set the screen to print and its details.

② The currently selected attributes are displayed.

③ Set the range of the screen to print.

Point

Ex.: This is the example of the actually printed specs.

Simulation

Using Simulation enables you to debug a screen without connecting PLC to GP.
To perform Simulation, it's necessary to transfer a simulation protocol to GP beforehand at the time of Transfer Screen (Refer to Intro.-23). In GP2000 series, simulation via Ethernet is also possible.

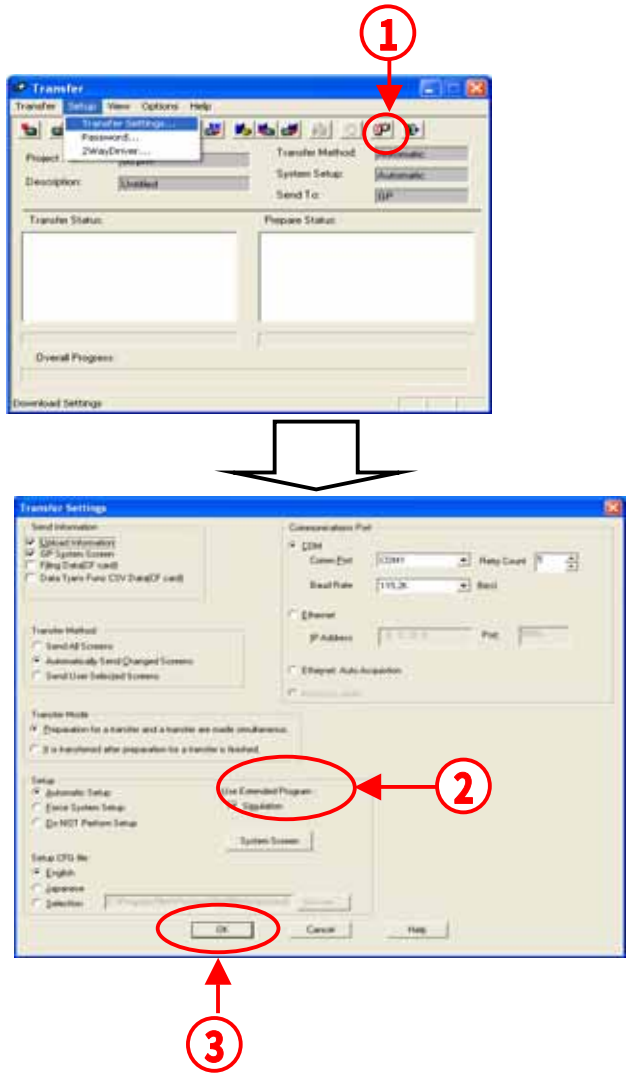
* When the setting of the connected device is Memory Link SIO/Ethernet, Mitsubishi:CC-Link, Omron: THERMAC-NEO series, simulation cannot be performed.

(1) Transfer the simulation protocol.

① Click the [Setup] icon.

② Check [Simulation]. Make a setting whether the simulation protocol is transferred or not.

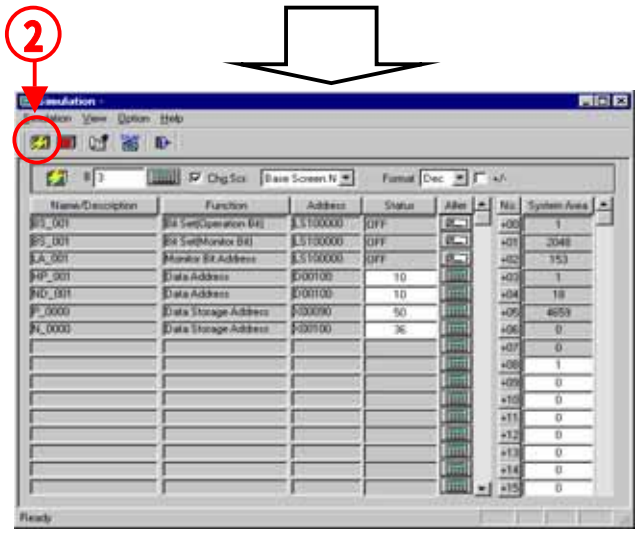
③ After the setting is completed, click [OK] to transfer it.



(2) How to switch to Simulation

Connect the GP and the PLC via a transfer cable (GPW-CB02) or an Ethernet cable.

① Click the [Simulation] icon.



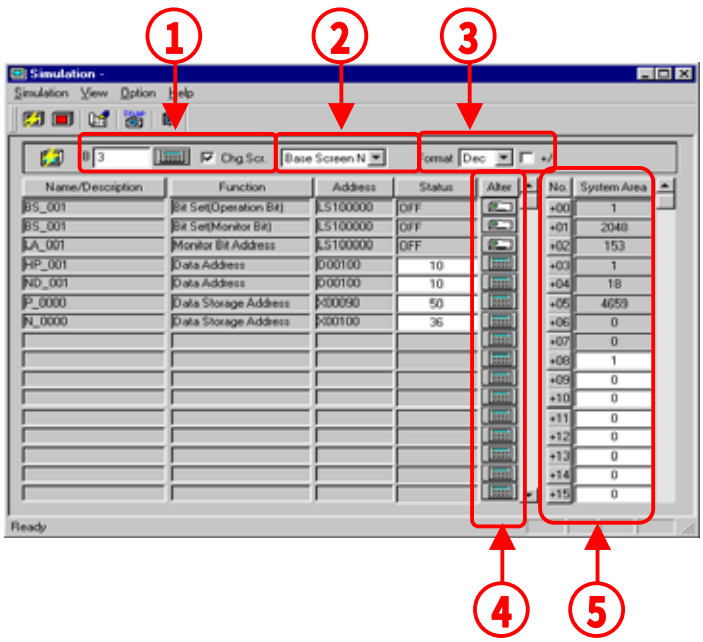
② Click the [Start] icon  .

Click the [Cancel] icon  .

Then Simulation ends.

(3) Operation/Settings of Simulation Screen

Once that Simulation starts, GP's operation can be checked.



① Click  and set the screen for Simulation. If [Change Screen] is checked, the GP also changes to the setup screen.

② Select items for Simulation.

③ Set the format of the data to display and input.

④ Change the data stored in each address.

⑤ It's possible to debug the system data area.

Memo (Feel free to use this space)