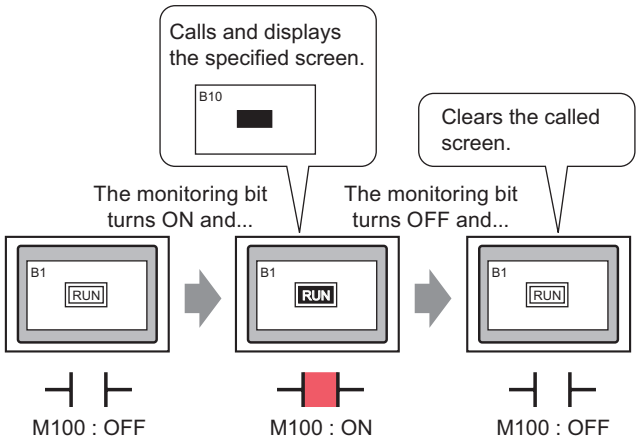
10 Displaying Pictures

This chapter explains how to use the GP-Pro EX [Picture Display] and basic ways of setting it up.
Please start by reading "10.1 Settings Menu" (page 10-2) then turn to the corresponding page.

10.1 Settings Menu

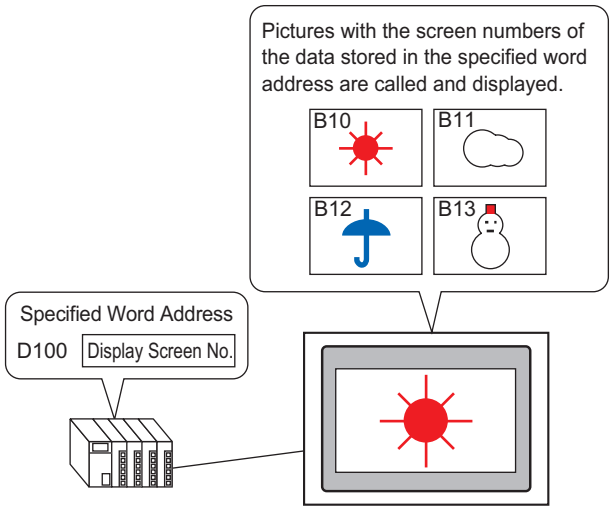
Changing a Picture with Bit ON/OFF



Displays or hides a picture corresponding to the state of a bit.

☞ Setup Procedure (page 10-5)
☞ Introduction (page 10-4)

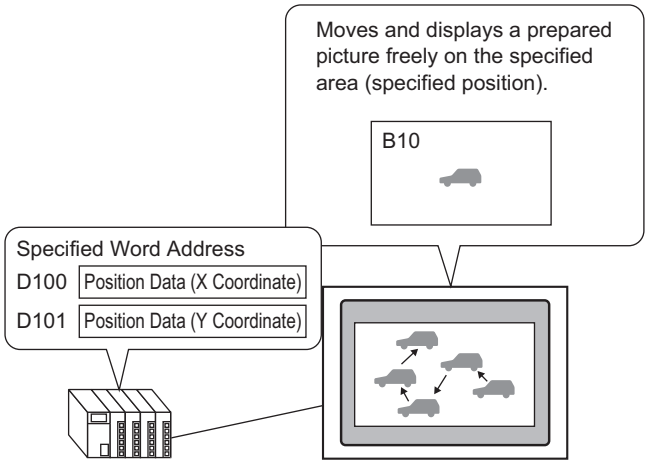
Displaying Alternate Pictures



Selects a picture to display according to the contents of a word address.

☞ Setup Procedure (page 10-12)
☞ Introduction (page 10-11)

Moving a Picture

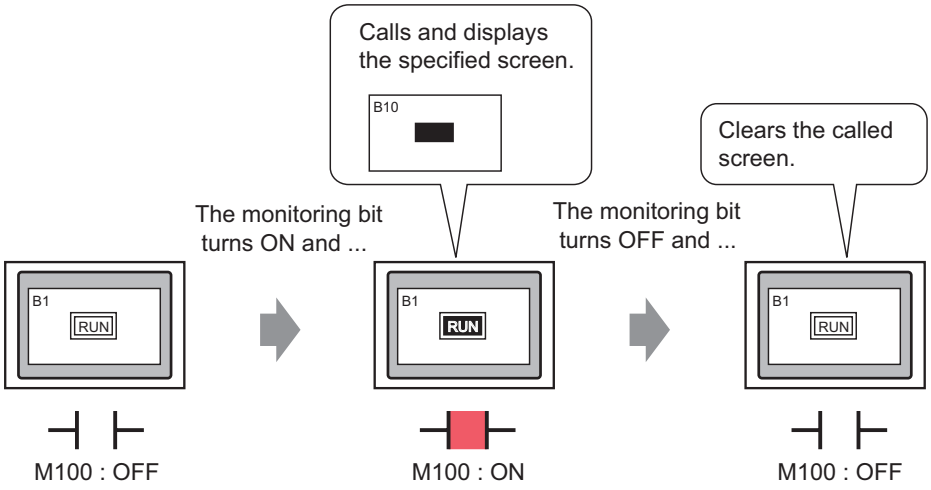


Displays a picture at the position given in the word addresses.

☞ Setup Procedure (page 10-18)
☞ Introduction (page 10-17)

10.2 Changing a Picture with Bit ON/OFF

10.2.1 Introduction

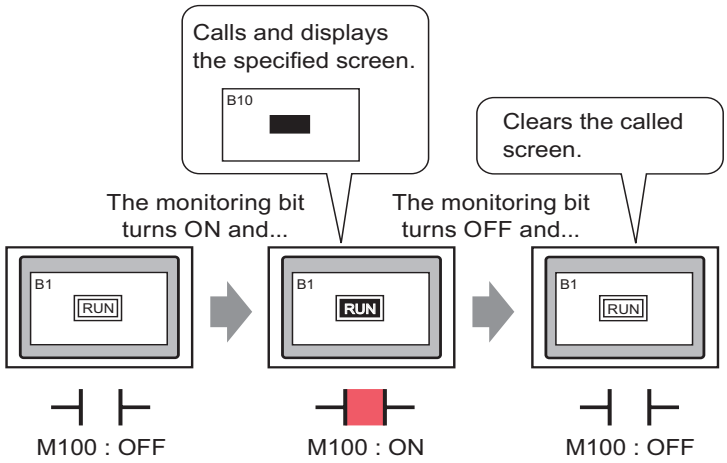


You can call and display pictures from other screens, or registered images, depending on the state of the specified bit address. In the following example, as the state of bit address M100 changes, Base Screen 10 (containing a red rectangle) will appear or disappear on top of the text in Base Screen 1.

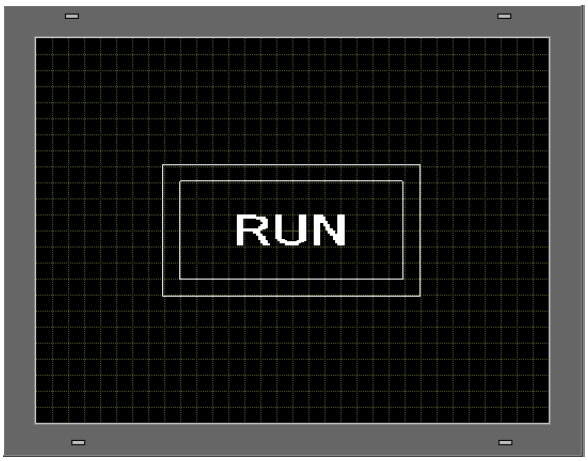
10.2.2 Setup Procedure

NOTE

- Please refer to the Settings Guide for details.
  ☞ " ■ ON/OFF Display" (page 10-26)
- For details about placing parts or setting addresses, shapes, colors, and labels, please refer to the following:
  ☞ "9.6.1 Editing Parts" (page 9-38)

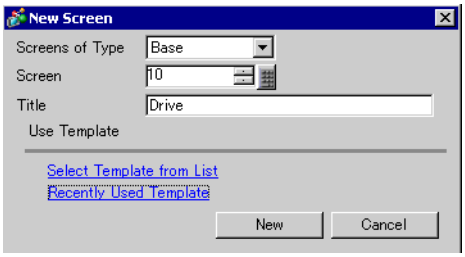


1 In screen Base 1, draw a rectangle and text as shown below.

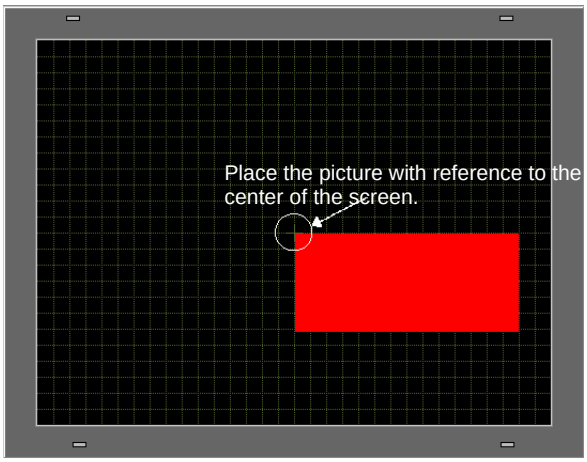


2 On the [Screen (S)] menu click the [New Screen (N)] command, or click  .

3 In [Screen Type] select [Base], in [Screen No.] enter 10, and click [New].



4 In the new screen, draw a rectangle the same size as the rectangle on Base 1. Set its fill color to red. When this screen is called as a Picture Display, it will affect the color in the overlapping area on the call destination screen, but will not completely obscure the original contents.



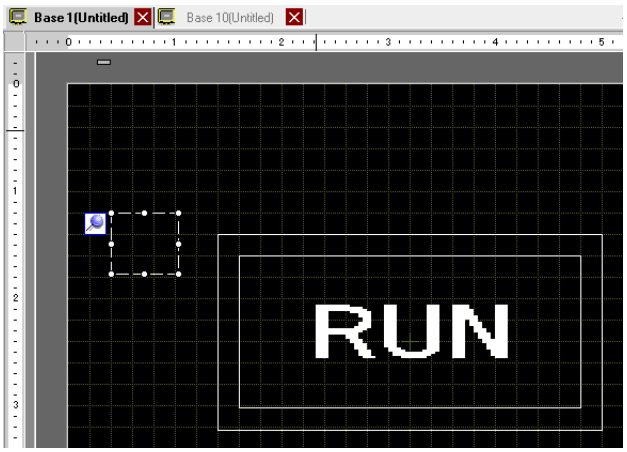
NOTE

- When the [Display Type] of a Picture Display is [ON/OFF Display] and the check box [Clearing Action] is selected, the color of the called picture may change where it overlaps with the destination screen background.

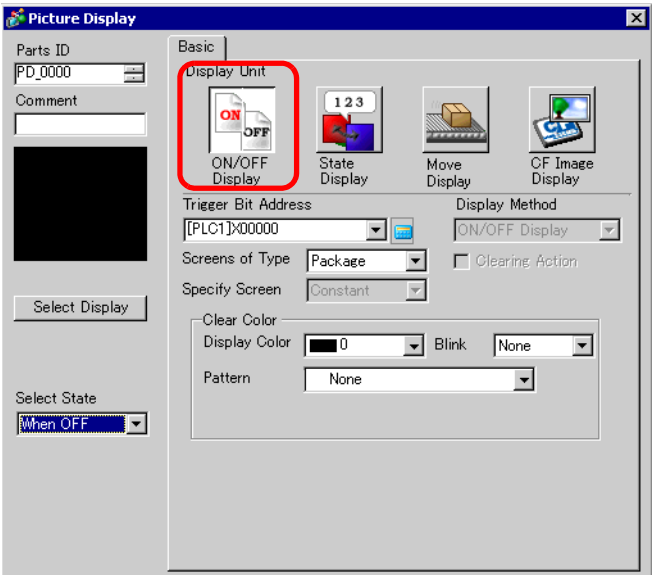
☞ “ ■ 8 Color Combination” (page 10-48)

- To position a called screen you specify where its center will be placed on the destination screen. Therefore drawing your picture with a vertex at the center of the drawing area may make it easier to later position this picture on the destination screen.

5 Click the [Base 1] tab. From the [Parts (P)] menu, point to [Picture Display (F)], or click , and place the picture display on the screen.



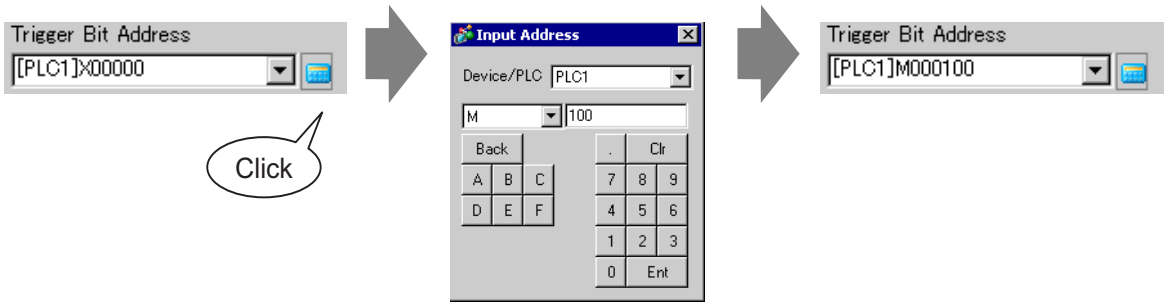
6 Double-click within the border of the Picture Display part to open the Picture Display dialog box.



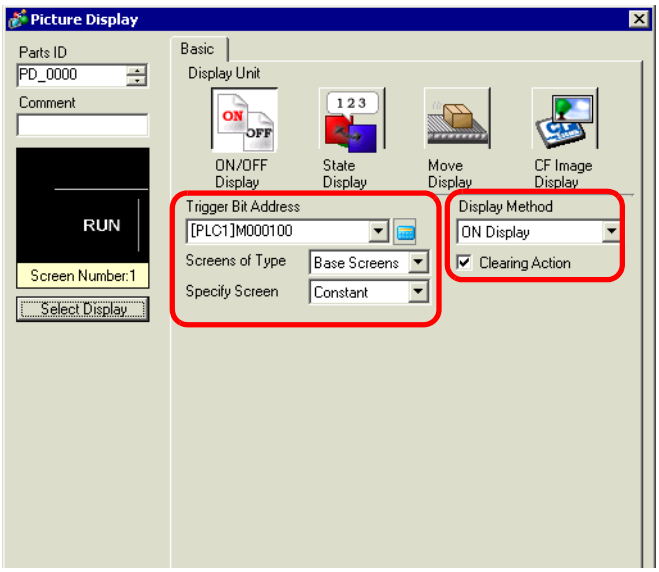
7 Under Display Type select [ON/OFF Display] and in [Trigger Bit Address] enter "M100".

Click the icon to display an address input keypad.

Select the device "M", input "100" in the address, and press the [Enter] key.

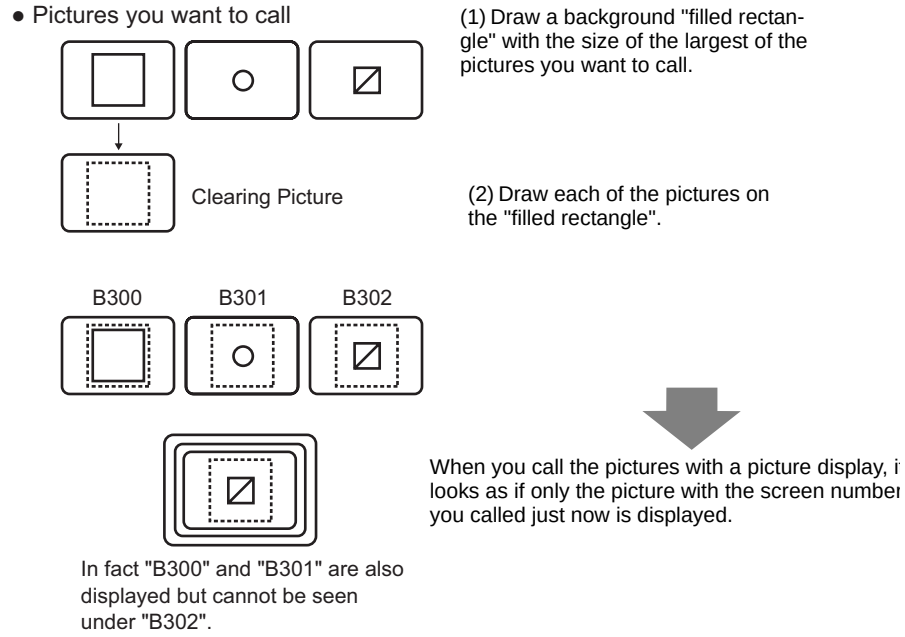


8 In [Screen Type] select Base Screen, in [Specify Screen] select Constant, in [Display Method] select ON Display, and select [Clearing Action].

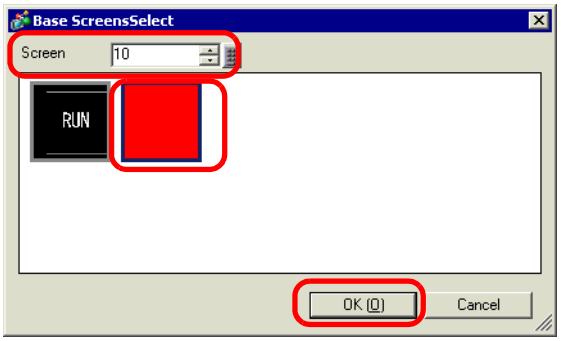


NOTE

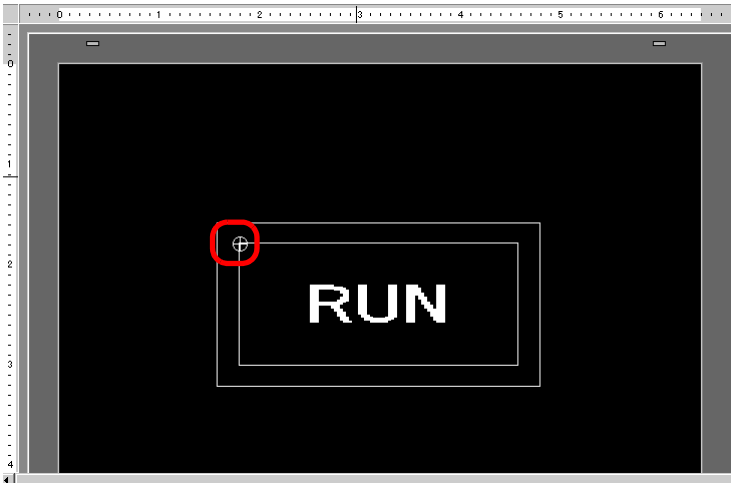
- If [Clearing Action] is not selected when you display pictures of different sizes by turning them ON or OFF, the pictures already displayed will not disappear. Instead, new pictures will be overlaid. To avoid visible overlapping, create a background for clearing as follows:



9 Click [Select Display], select Screen 10, and then click [OK].

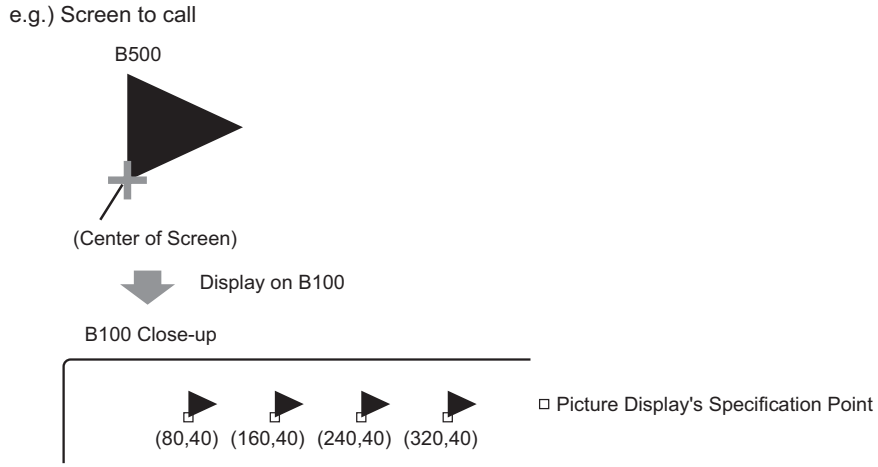


10 The [Picture Display] dialog box appears again. Click [OK]. When  is displayed on the screen, drag it to specify the position of the called picture.



NOTE

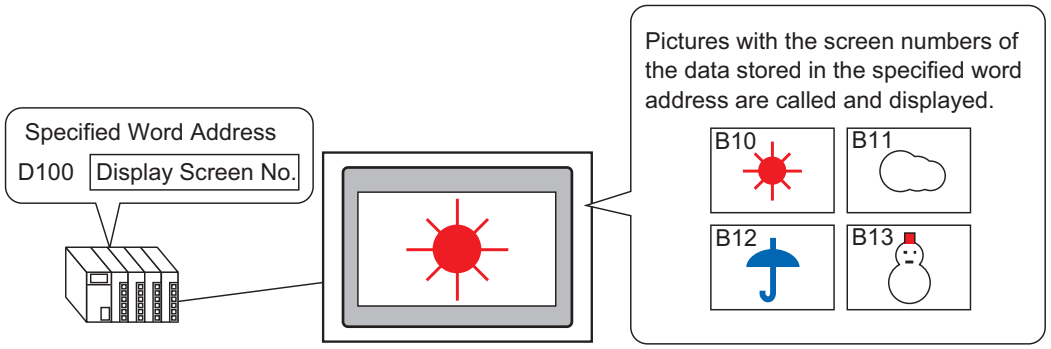
- When you select [Base Screen], [Image], or [Image CF Card] in [Screens of Type], the Picture Display will place the display position pointer on the Screen. This pointer determines the center of the screen you want to call.



The screen to call is displayed with its center overlapping the point specified on the picture display.

10.3 Displaying Alternate Pictures

10.3.1 Introduction

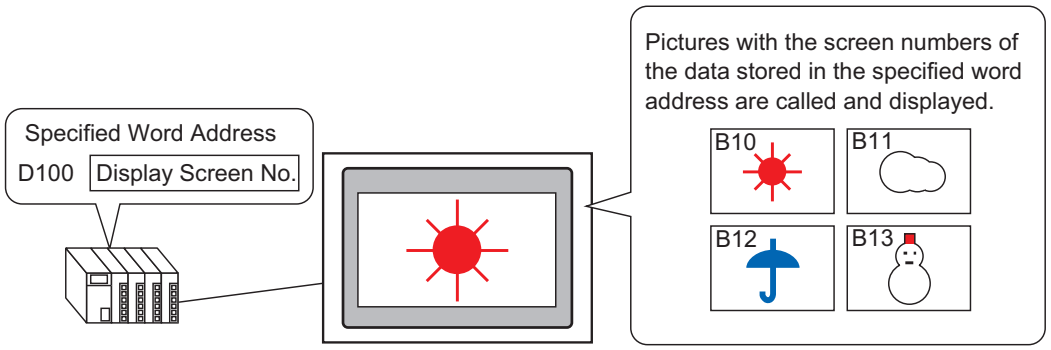


You can call and display pictures by their screen numbers stored in the specified word address. In the following example, when the content of word address D100 becomes 10, 11, 12 or 13, the corresponding Base Screens will appear within Base Screen 1.

10.3.2 Setup Procedure

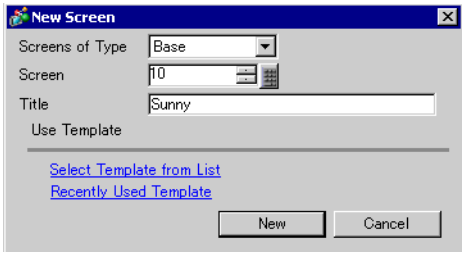
NOTE

- Please refer to the Settings Guide for details.
  ☞ " ■ State Display" (page 10-31)
- For details about placing parts or setting addresses, shapes, colors, and labels, please refer to the following:
  ☞ "9.6.1 Editing Parts" (page 9-38)



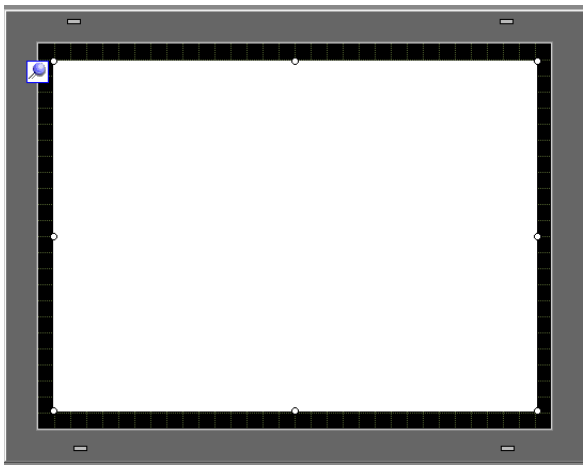
1 On the [Screen (S)] menu click the [New Screen (N)] command, or click .

2 In [Screen Type] select [Base], in [Screen No.] enter 10, and click [New].



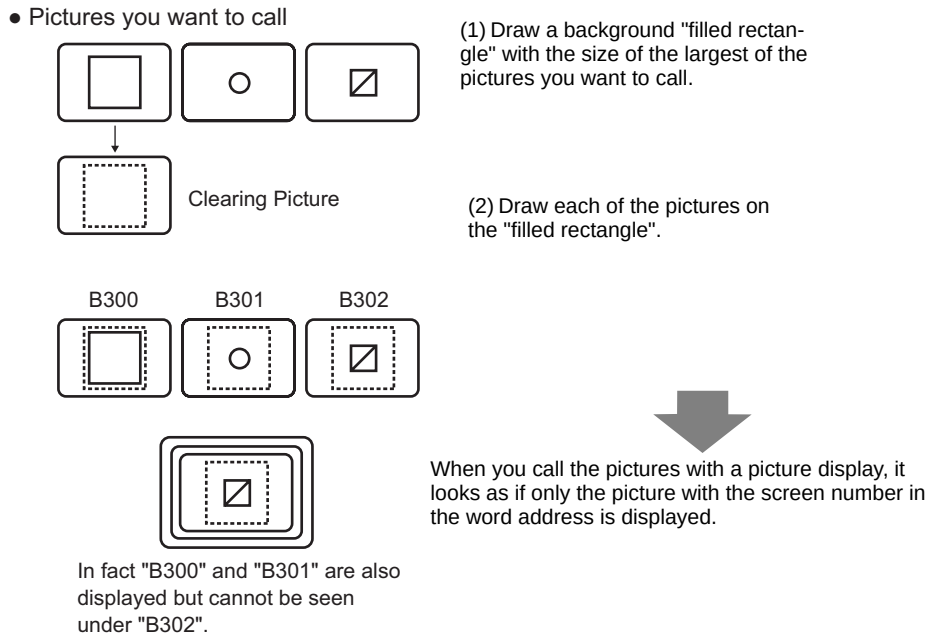
3 Create a background on the screen to be called.

B10



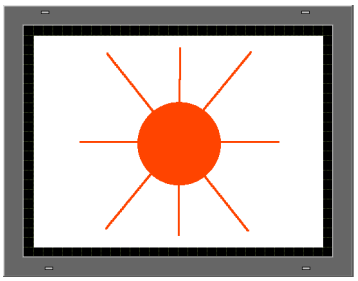
NOTE

- When the [Display Type] of a Picture Display is [State Display], called pictures will be overlaid. To avoid visible overlapping, create a background in the called screen to clear the previous picture.



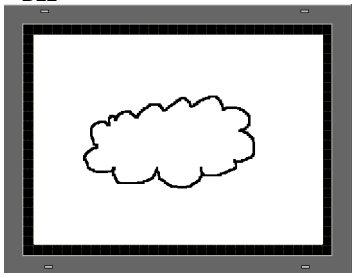
4 Draw a picture on the screen to be called.

B10

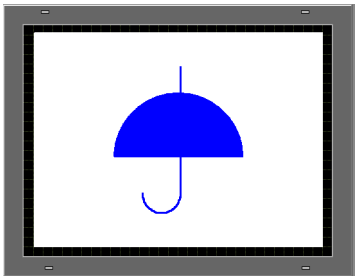


5 Repeat steps 1-4 to create additional screens Base 11, Base 12, and Base 13.

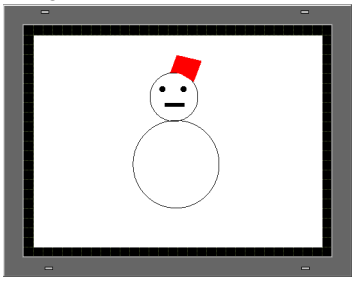
B11



B12



B13

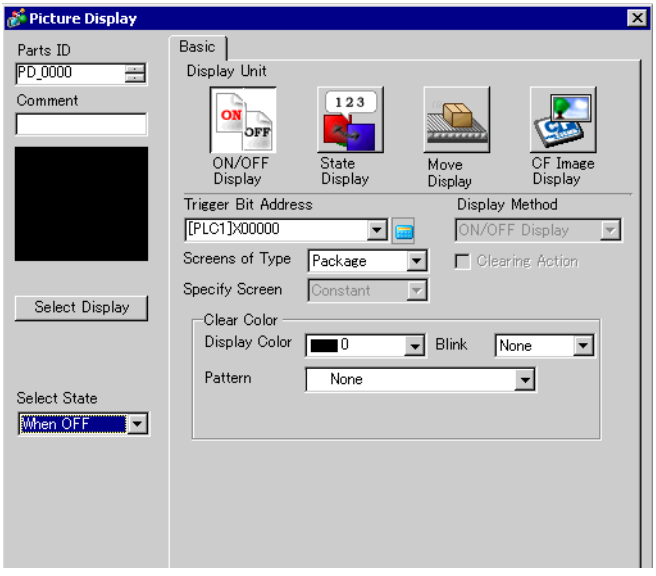


NOTE

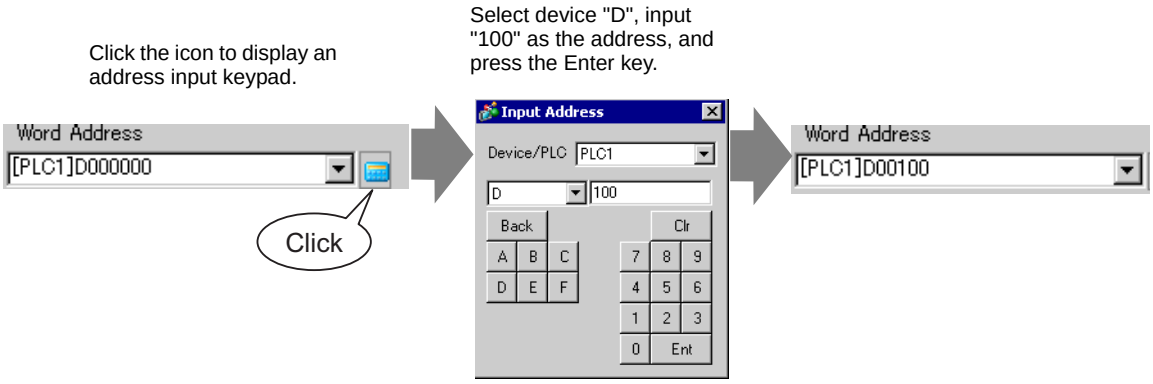
- To position a called screen you specify where its center will be placed on the destination screen. Therefore drawing your picture with a vertex at the center of the drawing area may make it easier to later position this picture on the destination screen.

6 Click the [Base 1] tab. From the [Parts (P)] menu, point to [Picture Display (F)] or click  , and place the Picture Display anywhere on the screen.

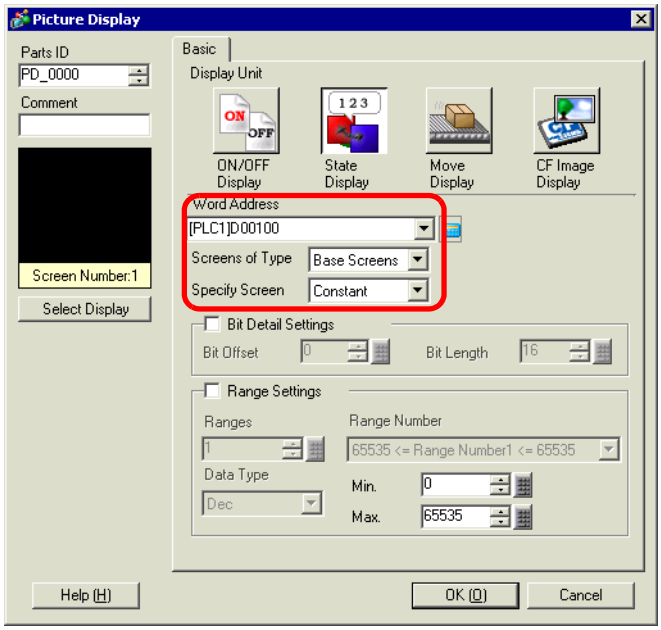
7 Double-click within the border of the Picture Display part to open the Picture Display dialog box.



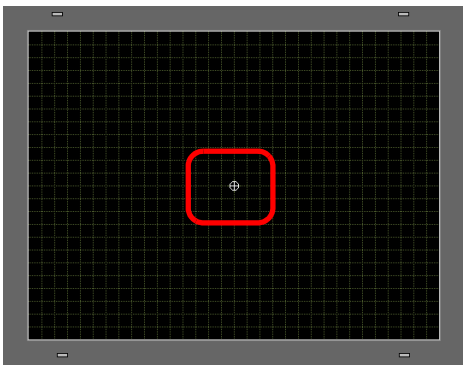
8 Under Display Type select [State Display] and in [Word Address] enter "D100".



9 In [Screen Type] select [Base Screen], and in [Specify Screen] select [Constant].



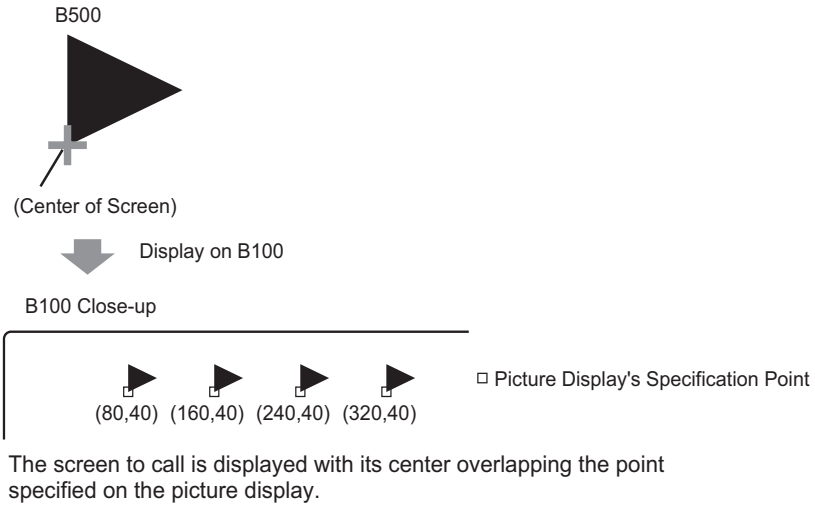
10 Click [OK] to specify the position of the called pictures.



NOTE

- When you select [Base Screen], [Image], or [Image CF Card] in [Screens of Type], the Picture Display will place the display position pointer on the Screen. This pointer determines the center of the screen you want to call.

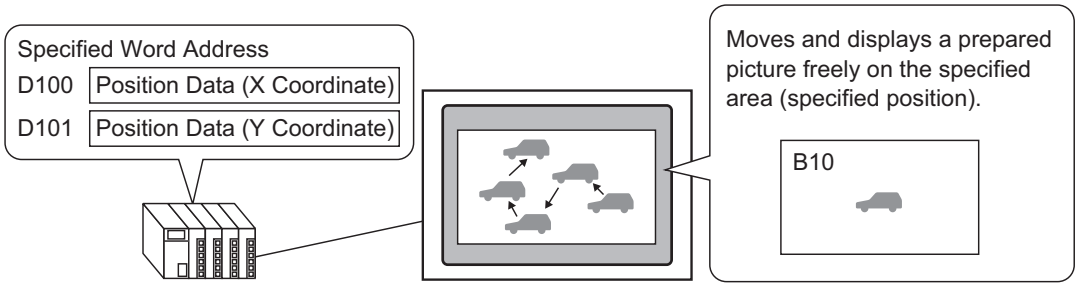
e.g.) Screen to call



The screen to call is displayed with its center overlapping the point specified on the picture display.

10.4 Moving a Picture

10.4.1 Introduction

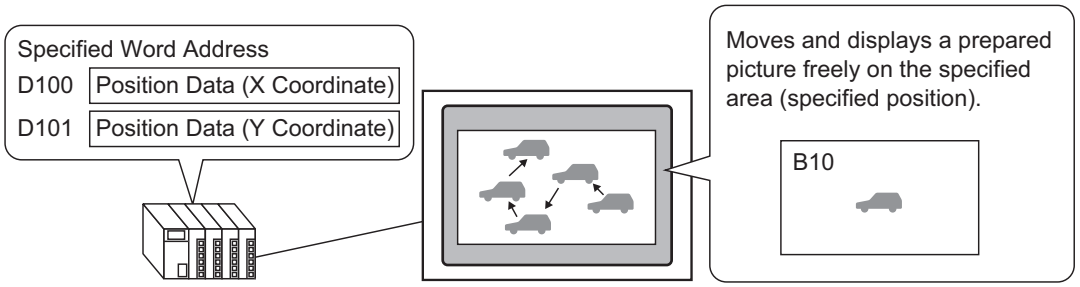


You can store the location data of the X/Y coordinates in the specified word address and call up and display pictures from other display screens at the location. You can move the display between 2 points on the line.

10.4.2 Setup Procedure

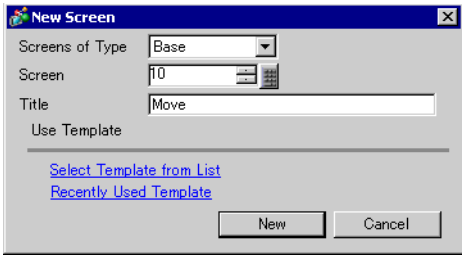
NOTE

- Please refer to the Settings Guide for details.
  ☞ " ■ Move Display" (page 10-37)
- For details about placing parts or setting addresses, shapes, colors, and labels, please refer to the following:
  ☞ "9.6.1 Editing Parts" (page 9-38)

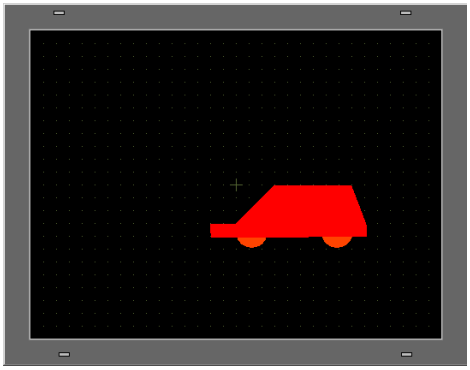


1 On the [Screen (S)] menu, click the [New Screen (N)] command or click .

2 In [Screen Type] select [Base], in [Screen No.] enter 10, and click [New].



3 Create a screen to be called.

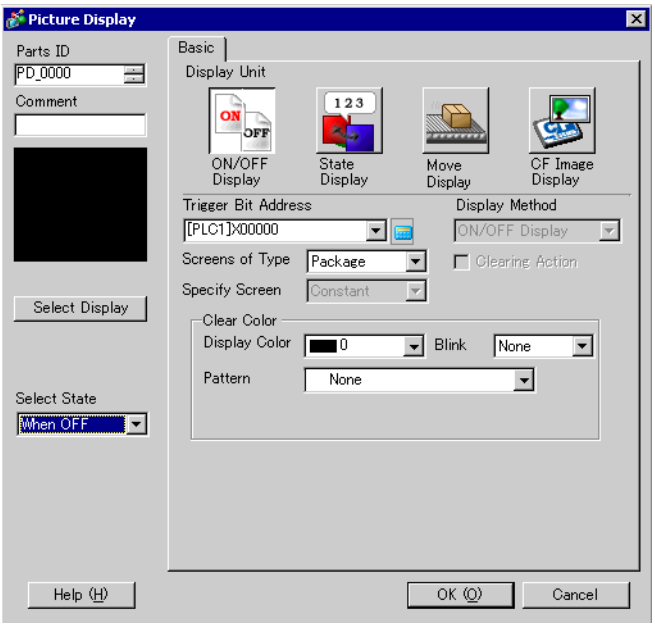


NOTE

- To position a called screen you specify where its center will be placed on the destination screen. Therefore drawing your picture with a vertex at the center of the drawing area may make it easier to later position this picture on the destination screen.

4 Click the [Base 1] tab. From the [Parts (P)] menu, point to [Picture Display (F)] or click , and place the Picture Display anywhere on the screen.

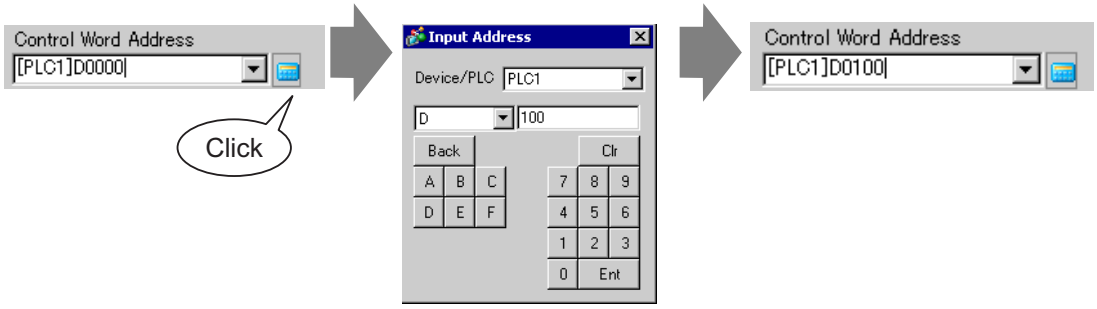
5 Double-click within the border of the Picture Display part to open the Picture Display dialog box.



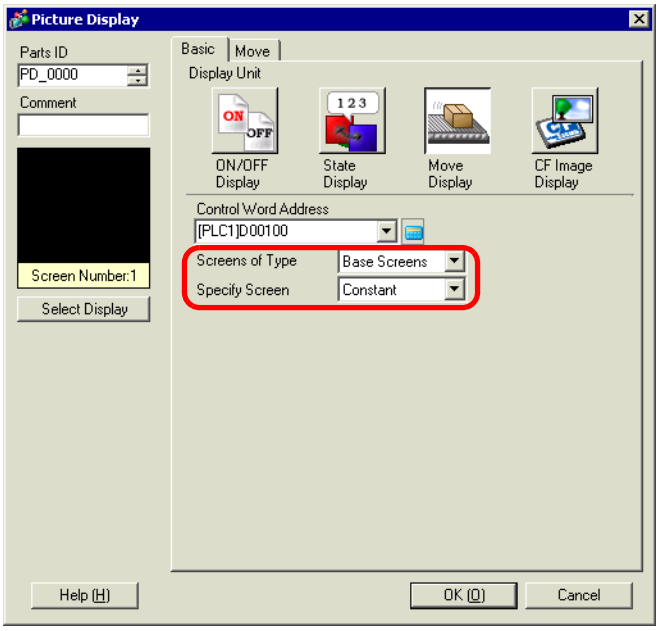
6 Under [Display Type] select [Move Display] and in [Control Word Address] enter "D100".

Click the icon to display an address input keypad.

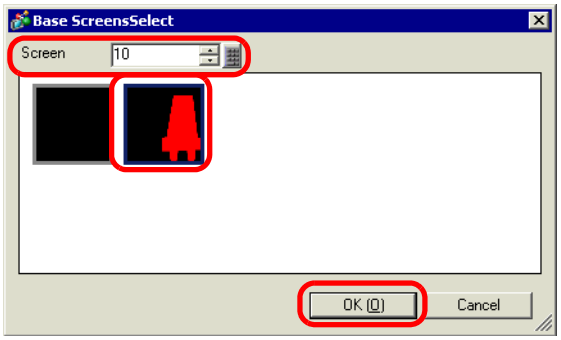
Select device "D", input "100" as the address, and press the Enter key.



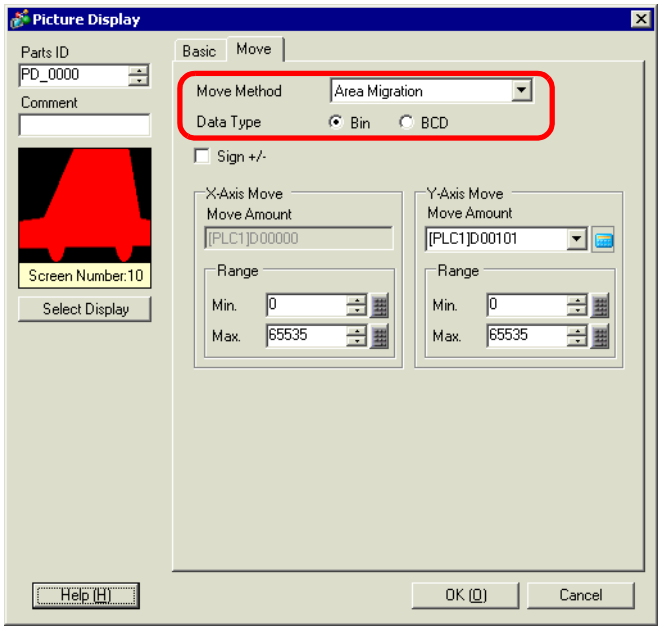
7 In [Screen Type] select [Base Screen], and in [Specify Screen] select [Constant].



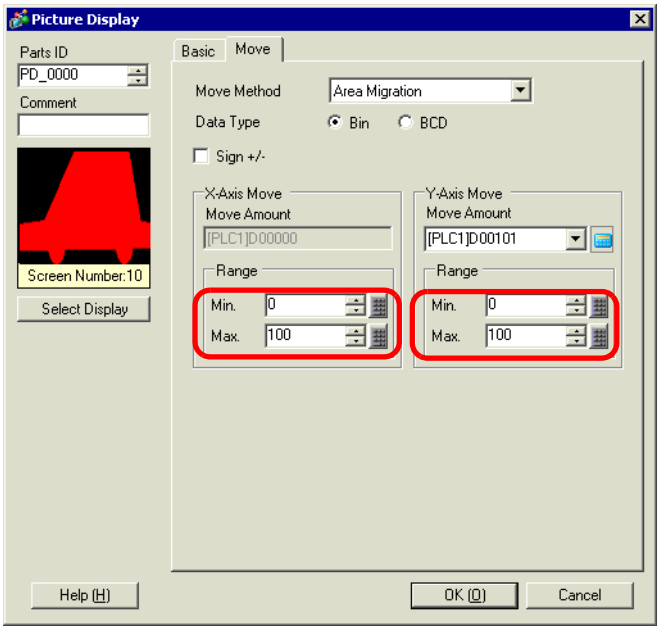
8 Click [Select Display], select Screen 10, and then click [OK].



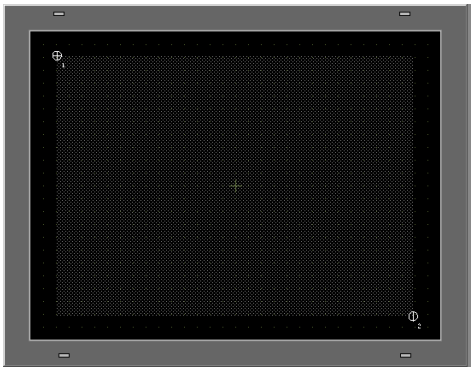
9 In the Picture Display dialog box, click the [Move Settings] tab. In [Move Method] select Area Migration, and in [Data Type] select Bin.



10 Under both [X-Axis Move] and [Y-Axis Move], in Min Value enter 0 and in Max Value enter 100. Then click [OK].

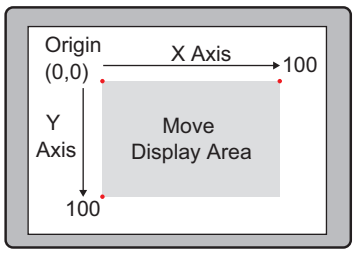


11 On Base Screen 1, specify an origin position for the called picture.



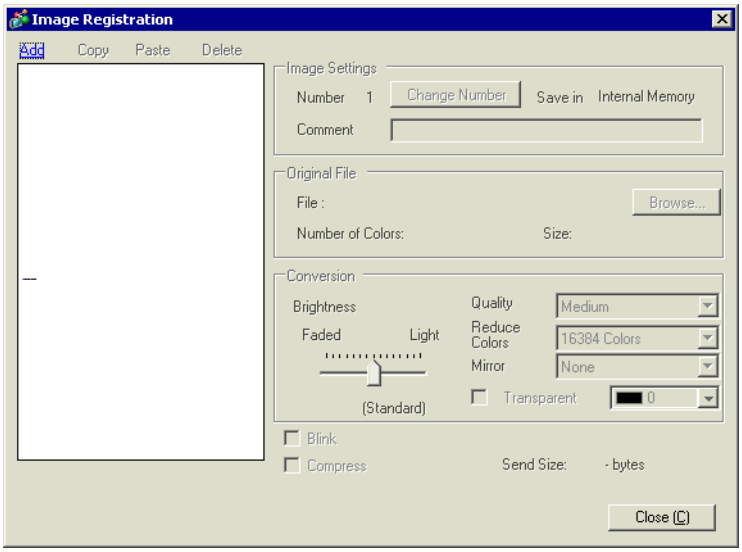
NOTE

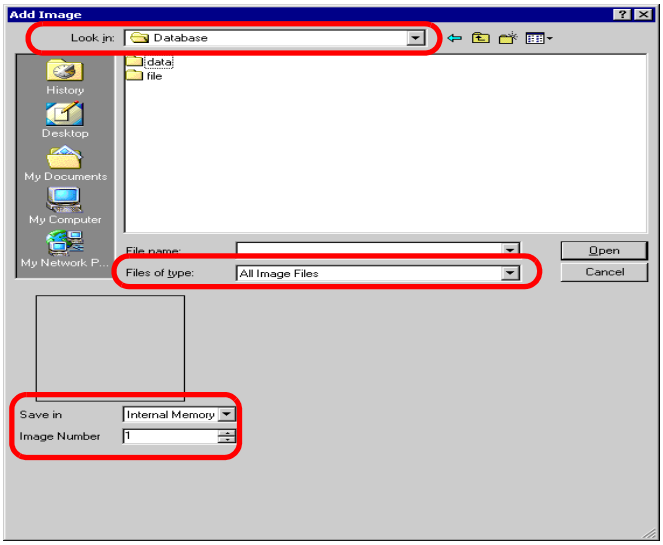
- In the example, the move distance in X and Y directions would be as follows:



10.5 Settings Guide

10.5.1 Common (Image Registration) Settings Guide



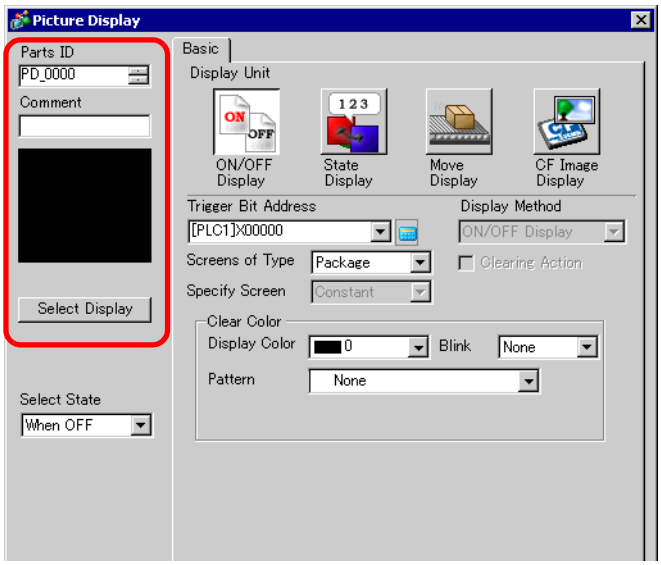
Setting	Description
Add	The [Add Image] dialog box appears. Specify [Look in], [File name], [Save in] and [Image Number] to add an image. 
Copy	Copies the selected image data.
Paste	Pastes copied image data.
Delete	Deletes the selected image data.
List of images	Displays a list of the set images.

Continued

Setting		Description
Image Settings		Displays the information set for the image.
	Number	Displays the number set for the image.
	Change Number	Change the image Number to any value between 1 and 8,999.
	Save in	Displays [Internal Memory] or [CF Card] as the location where the image is saved.
	Comment	Displays the comment set for the image.
Original File		Displays the information for the source image of the selected image.
	File	Displays the original file path.
	Reference	Select the original file.
	Number of Colors	Displays the number of image colors, by the number of bits.
	Size	Displays the image width and height in pixels.
Conversion		Used to convert the image.
	Brightness	Adjusts the image brightness.
	Quality	Sets the image quality. Select [No Adjustment], [Coarse], [Medium] or [Fine].
	Decrease Colors	Reduces the number of image colors.
	Flip	Mirrors the image appearance. Select [None], [Portrait] or [Landscape].
Blink		Sets image blink.
Compress		Compresses the image size.
Image Size		Displays the image size in bytes.

10.5.2 Picture Display Settings Guide

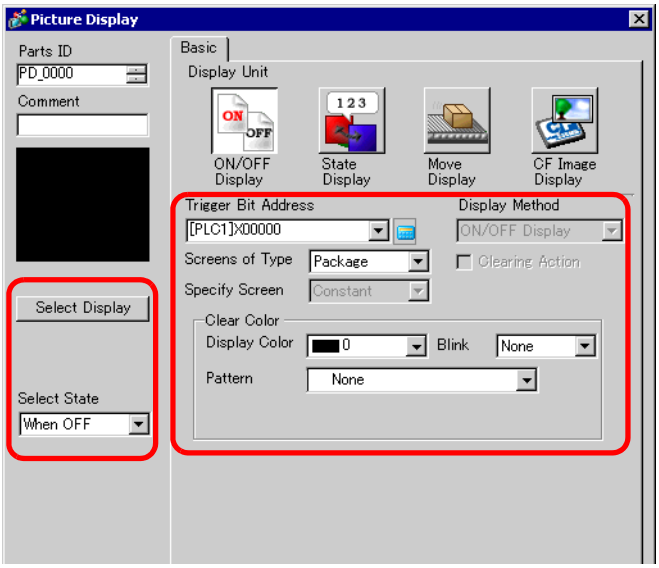
■ Common to all Parts

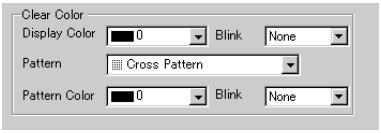
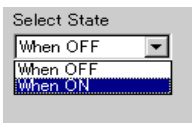


Setting	Description
Part ID	Placed parts are automatically assigned an ID number. PD_**** 4 digits The letter portion of the ID is fixed and depends on the Part. The number portion can be changed. The value ranges from 0000 to 9999.
Comment	The comment for each Part can be up to 20 characters long.
Select Display	You can select a screen to be called with a picture display.

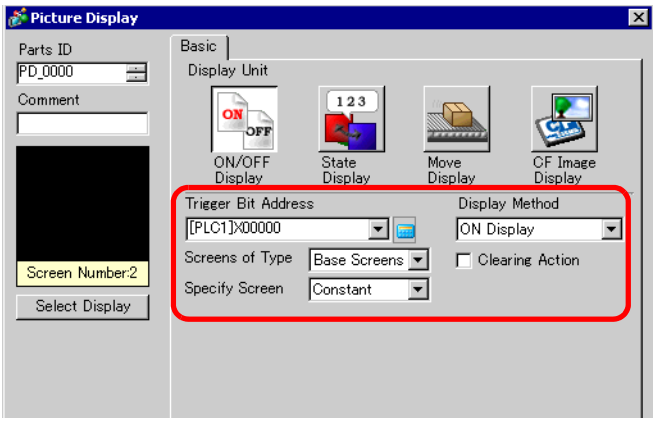
■ ON/OFF Display

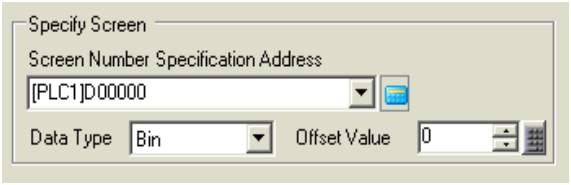
◆ Basic Settings (for Package)



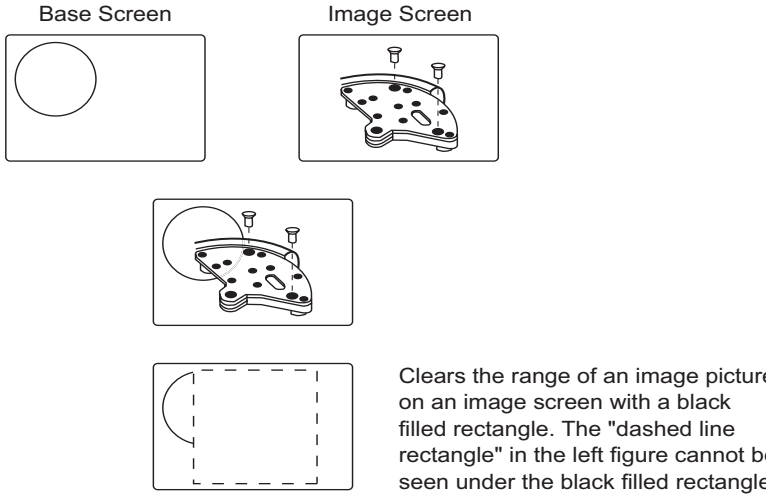
Setting	Description
Triggered Bit Address	Specify the Bit Address to monitor (monitoring bit).
Screens of Type	Select the screen type to display.
Package	Displays a picture registered in [Package].
Clear Color	Set the background color for a picture registered in [Package]. 
Display Color	Set the background color for the picture to be called.
Pattern	Set the background pattern for the picture to be called.
Pattern Color	Set the background pattern color for the picture to be called.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the Part's [Display Color] and [Pattern Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
Select Display	Select a picture registered in [Package].
Select State	Select When ON or When OFF, click [Select Display], and specify a picture to display. 

◆ Basic Settings (for Base Screen, Image, and Image CF)

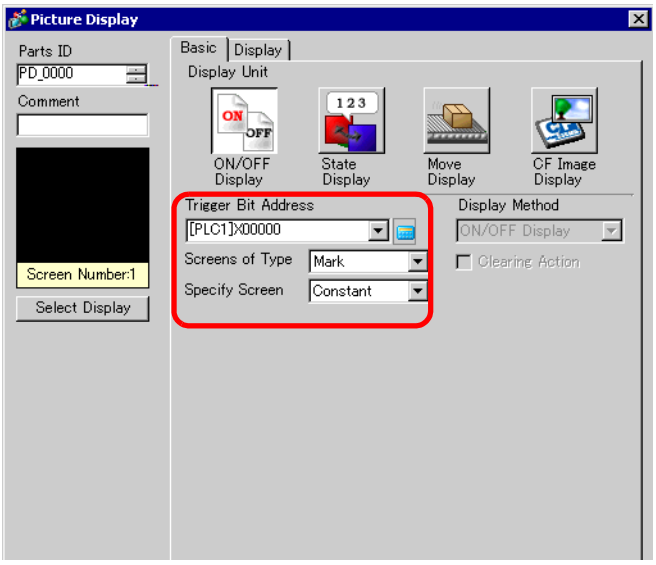


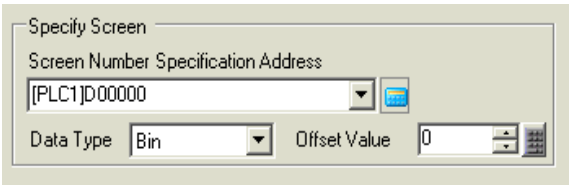
Setting	Description
Triggered Bit Address	Specify the Bit Address to monitor (monitoring bit).
Display Method	Select the display method from [ON Display] or [OFF Display].
ON Display	Displays a screen picture with the Triggered Bit Address turned ON.
OFF Display	Displays a screen picture with the Triggered Bit Address turned OFF.
Screens of Type	Select the screen type to display.
Base Screen	Displays a base screen.
Image (Main Unit)	Displays an image screen.
Image (CF)	Displays an image screen saved in a CF card.
Specify Screen	Select the designation method of a screen to display from [Constant] or [Address].
Constant	A screen picture to display is fixed. Click "Select Display" and specify the screen you want to display.
Address	A screen picture to display is variable. You can change and display screens by storing the screen numbers in the Display Screen Address. A screen type to display is fixed. 
Screen Settings	Set the screen to display with a variable setting.
Display Screen Word Address	Set the word address where the screen number to display is stored.
Data Type	Choose the data type of the display screen address from [Bin] or [BCD].
Offset	Set the offset value from 0 to 9999. A screen picture with the offset value added to the screen number stored in the display screen number address will be displayed.

Continued

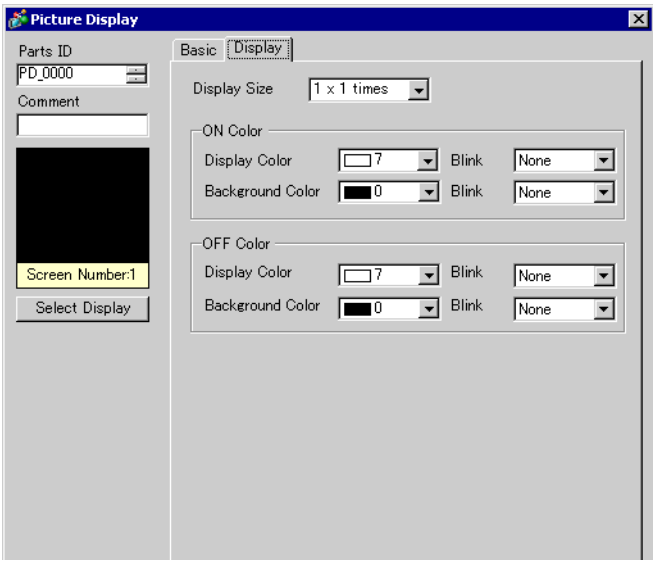
Setting	Description
Clearing Action	If this check box is selected, the screen picture will change between the Display/Hide according to the Triggered Bit Address change. If it is not selected, the previously displayed picture will remain. **NOTE** • If you want to call and display figures or text of the base screen with [Clearing Action] selected, they will be in XOR Display (the color of the overlapping area will be different from the specified color). Please exercise caution when you place one color over another. ☞ "10.6.1 Restrictions for Picture Display (ON/OFF Display)" (page 10-47) • If the overlapping target is image font, it will not have the XOR display. • If you display an image screen with [Clearing Action] selected, the display will be overwritten and the clearing will overwrite the image screen's display range with black.  • With [Clearing Action] selected, pictures using two or more of the same dots partially in the drawing process (3-dot or 5-dot lines, lines with 2-dot arrow, or raised characters, etc.) cannot be normally displayed on a screen picture to display.

◆ Basic Settings (for Mark)



Setting	Description
Triggered Bit Address	Specify the Bit Address to monitor (monitoring bit).
Screens of Type	Select the screen type to display.
Mark	Displays a picture registered in the mark screen.
Specify Screen	Select the designation method of a screen to display from [Constant] or [Address].
Constant	A Mark Screen to display is fixed. Click [Select Display] and specify the screen you want to display.
Address	A mark screen to display is variable. You can change and display screens by storing the screen numbers in the Display Screen Word. 
Display Screen Word Address	Set the word address where the screen number to display is stored.
Data Type	Choose the data type of the display screen address from [Bin] or [BCD].
Offset	Set the offset value from 0 to 8,999. A mark screen with the offset value added to the screen number stored in the display screen number address will be displayed.

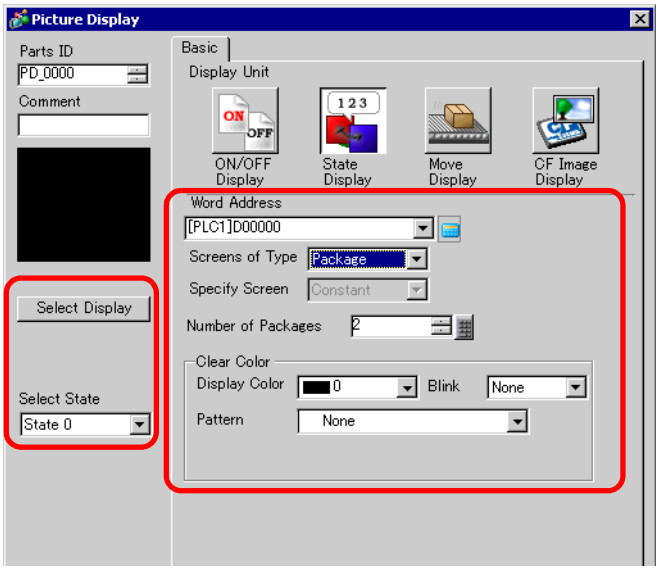
◆ Display (for Mark)

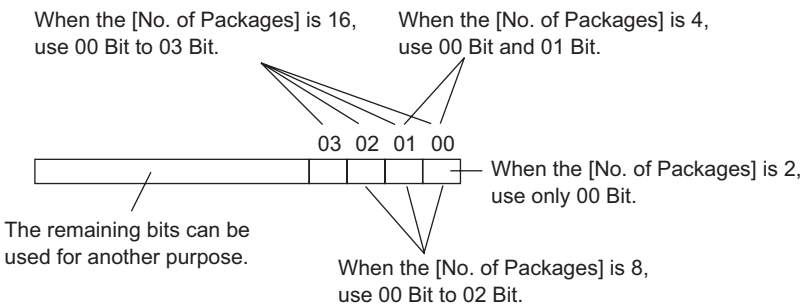


Setting		Description
Display Size		Set the display size of a picture registered in the Mark Screen. Set within the range of minimum size (1 x 1) and maximum size (8 x 8).
ON Color		Set the color of the mark to display when the trigger bit address turns ON.
	Display Color	Select a color for the mark to display.
	Background Color	Select a background color for the mark to display.
	Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], and [Background Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
OFF Color		Set the mark screen color to display when the trigger bit address turns OFF.
	Display Color	Select a color for the mark to display.
	Background Color	Select a background color for the mark to display.
	Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], and [Background Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

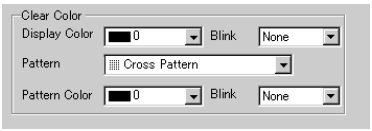
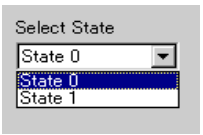
■ State Display

◆ Basic Settings (for Package)

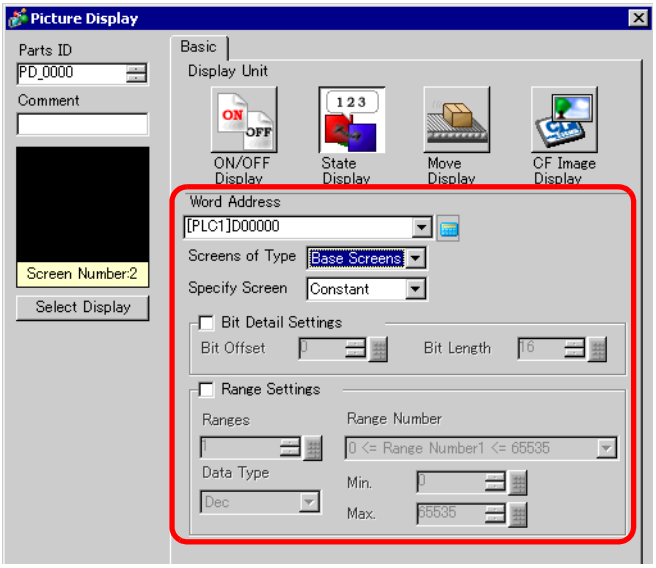


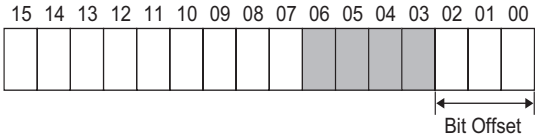
Setting	Description
Word Address	Set the word address to change display. Screens are changed and displayed according to the set word address data changes.
Screens of Type	Select the screen type to display.
Package	Displays a picture registered in [Package].
Specify Screen	Fixed with "Constant". Specify the package to display from [Select Display].
Number of Packages	Select the number of package pictures to change from [2], [4], [8], or [16]. **NOTE** • Package pictures change in response to the state changes of sequential bits starting from the 00 bit in the specified word address. In response to the [Number of Packages], bits are automatically assigned from the specified word address 00 bit. 

Continued

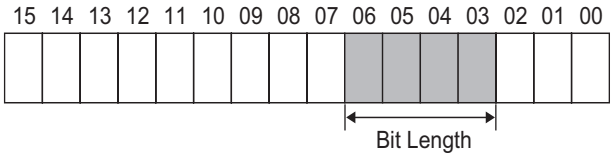
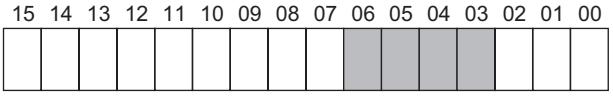
Setting		Description
Clear Color		Set the background color for a picture registered in [Package]. 
	Display Color	Set the background color for the picture to be called.
	Pattern	Set the background pattern for the picture to be called.
	Pattern Color	Set the background pattern color for the picture to be called.
	Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the Part's [Display Color] and [Pattern Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
Select Display		Select a picture registered in Package.
Select State		Select each state of State 0 to State 15 (max), click [Select Display], and specify a screen picture to display. 

◆ Basic Settings (for Base Screen, Image, and Image CF)

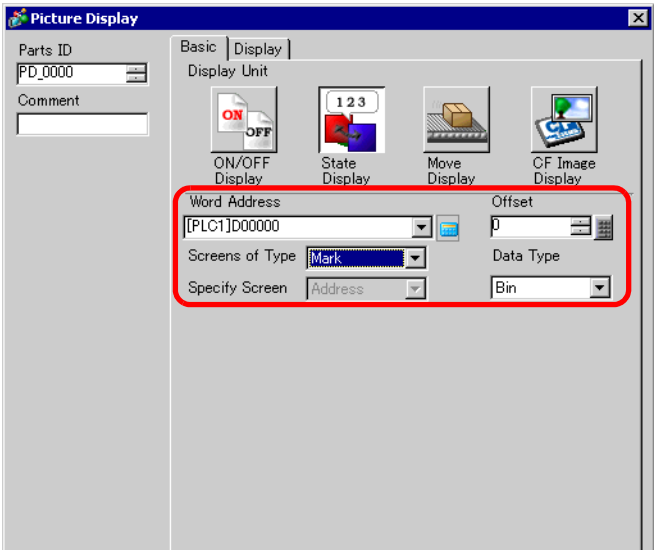


Setting		Description
Word Address		• When neither [Bit Detail Settings] nor [Range Settings] is set: Set the word address to change display. The screen with the screen number stored in this word address will be displayed. • When either [Bit Detail Settings] or [Range Settings] is set: Changes screens sequentially from the top screen specified from [Select Display] in the timing of bit address changes in this word address. (Bit Detail Settings) Or changes screens sequentially from the top screen specified from [Select Display] in response to the range of data changes.
Screens of Type		Select the screen type to display.
	Base Screen	Displays a base screen.
	Image (Main Unit)	Displays an image screen.
	Image (CF)	Displays an image screen saved in a CF card.
Specify Screen		Select the designation method of a screen to display from [Constant] or [Address].
Bit Detail Settings		Set which bit in the word address to assign for display. The display data is determined by the [Bit Offset] and [Bit Length] settings.
	Bit Offset	Set which bit in the Word Address to start to assign for display. Set the offset value from 0 to 15. Set "0" when you use all the word addresses or when offset settings are not needed. 

Continued

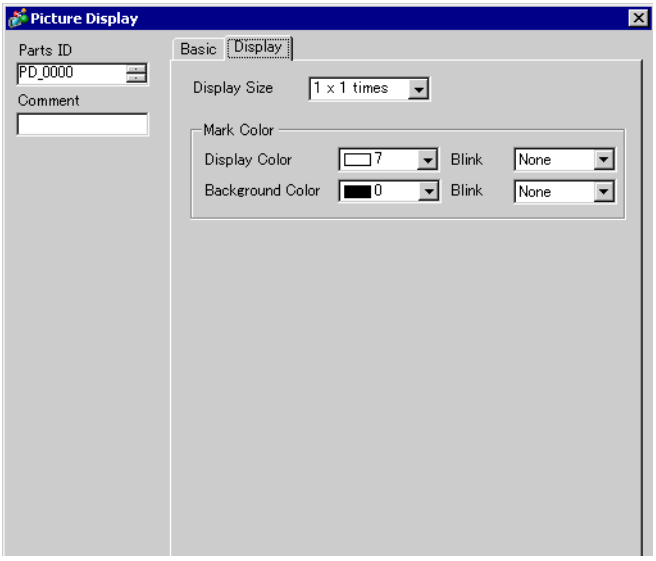
Setting		Description
Bit Detail Settings	Bit Length	Set the number of bits in the word address to assign for display. Set the [Bit Length] from 1 to 16. Set the bit length within the range of [Bit Offset] + [Bit Length]<=16 if the bit offset is not 0. The number of screens to change is determined by the [Bit Length] settings. 
Range Settings		Set the number of pictures to change and the data value to change to each screen. The range of data for use depends on the [Bit Detail] settings. **NOTE** • Data for display change are the bits set for the data length, starting from the number of bits set for the [Bit Offset] after the 0 bit. For example, When the bit offset is "3" and the bit length is "4", the following 4 bits are used as data for change display. 
	Ranges	Set the number of screens to change as the number of ranges. The setting range is from 1 to 32. However, values exceeding the bits of data set for the [Bit Length] cannot be displayed. For example, When the bit length is "4", the number of ranges is 1 to 16.
	Data Type	Select the Range Settings [Min Value] and [Max Value] data type from [Dec], [Hex], or [BCD].
	Range Number	Select the [Range Number] to be set.
	Min	Set the minimum value of the selected range.
	Max	Set the maximum value of the selected range.

◆ Basic Settings (for Mark)



Setting	Description
Word Address	Set the word address to change display. Stores the Mark Screen numbers to display in the set word address.
Screens of Type	Select the screen type to display.
Mark	Displays a picture registered in the mark screen.
Specify Screen	Fixed with [Address]. The screen number of the Mark Screen to be displayed is stored in the address set to the [Word Address].
Offset	Set the offset value from 0 to 8999. A Mark Screen matching the sum of the offset value and the screen number stored in the word address will be displayed.
Data Type	Select the data type of the stored number from [Bin] or [BCD].

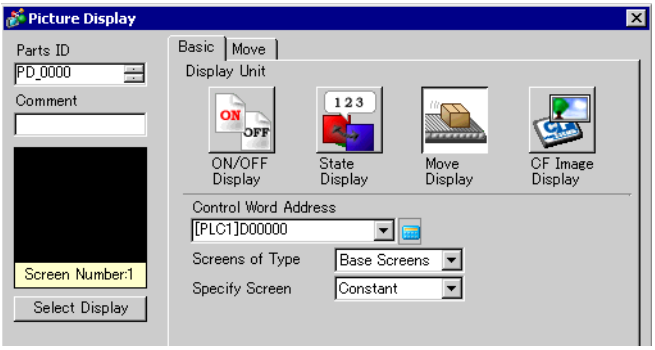
◆ Display (for Mark)

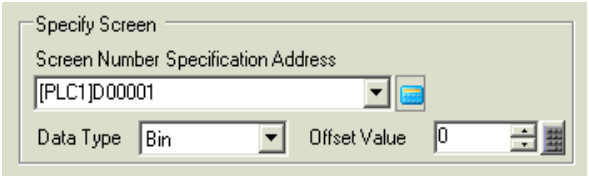


Setting		Description
Display Size		Set the display size of a picture registered in the Mark Screen. Set within the range of minimum size (1 x 1) and maximum size (8 x 8).
Mark Color		Set the color of a picture registered in the Mark Screen.
	Display Color	Select a color for the mark to display.
	Background Color	Select a background color for the mark to display.
	Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], and [Background Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

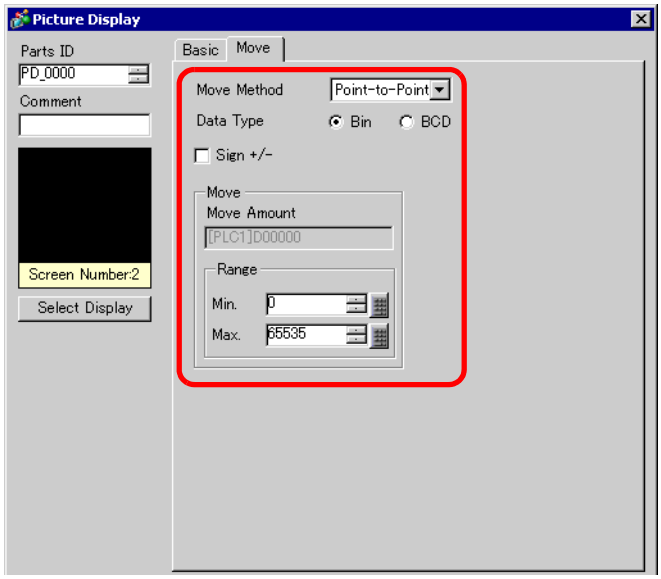
■ Move Display

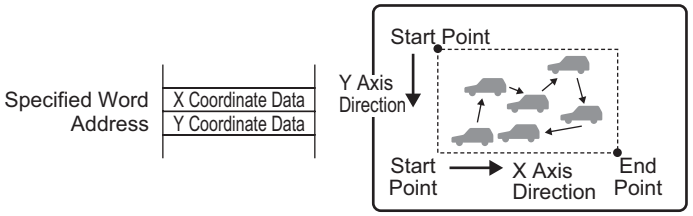
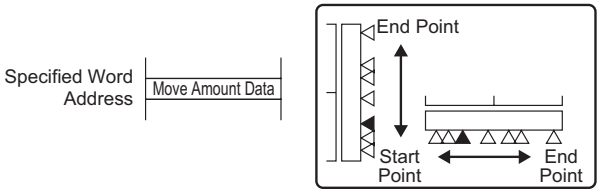
◆ Basic Settings



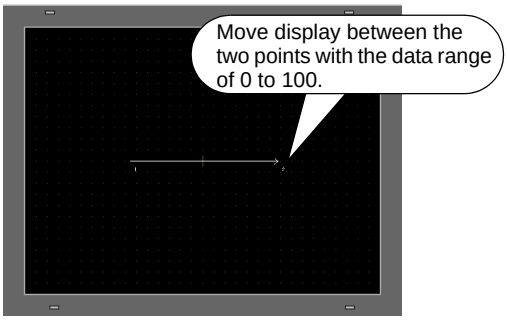
Setting			Description
Control Word Address			Designate the word address which stores the move amount. Moves and displays a screen picture in response to the stored data.
Screens of Type			Select the screen type to display. **NOTE** • With move display, a screen to be called is displayed with the center overlapping the coordinate position (display position) set on the picture display.
	Base Screen		Displays a base screen.
	Image (Main Unit)		Displays an image screen.
	Image CF Card		Displays an image screen saved in a CF card.
	Mark		Displays a picture registered in the Mark Screen.
Specify Screen			Select the designation method of a screen to display from [Constant] or [Address].
	Constant		A Mark Screen to display is fixed. Click [Select Display] and specify the screen you want to display.
	Address		The displayed screen is variable. Storing the screen in the screen number specification address allows you to switch to display the screen picture. 
Specify Screen	Address	Screen Specify Range Address	Set the address where the screen number to display is stored.
		Data Type	Select the display screen address data type from [Bin] or [BCD].
		Offset Value	Set the offset value. A screen picture with the offset value added to the screen number stored in the display screen number address will be displayed.

◆ Move (for Base Screen, Image, and Image CF)



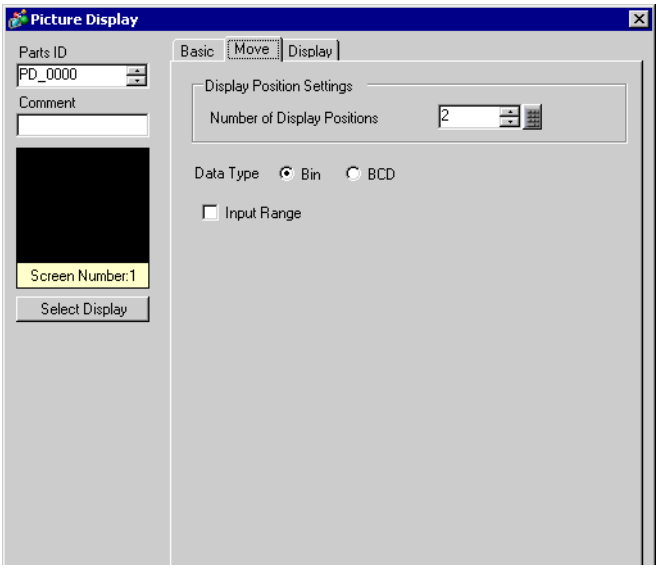
Setting		Description
Move Method		Select the move method from [Area Migration] or [Point-to-Point Move].
	Area Migration	Moves and displays a library freely in the specified area. • Area Migration A screen to be called moves in an area. Two words are used for data. 
Move Method	Point-to-Point Move	Moves and displays a screen on the line between the two specified points. • Point-to-Point Move A screen to be called moves linearly between two points. One word is used for data. 
Data Type		Select the data type of the word address to store the move amount from [Bin] or [BCD].

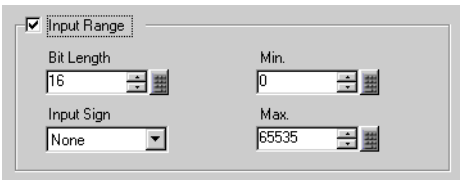
Continued

<table>
<tr><th colspan="3">Setting</th><th>Description</th></tr>
<tr><td colspan="3">Sign +/-</td><td>Select if you want to display negative data. This can be set only when the data type is [Bin].</td></tr>
<tr><td colspan="3">Move</td><td>Set the Move Amount and the Range.</td></tr>
<tr><td></td><td colspan="2">Move Amount</td><td>Set the word address which stores the move amount. Moves and displays another screen pictures by the data changes in the set word address.
NOTE
• For area migration, set two word addresses to store the move amount on X Coordinate/Y Coordinate.</td></tr>
<tr><td></td><td colspan="2">Range</td><td>Set the move range.
For example, For point-to-point move with the maximum value "100" and the minimum value "0"
 

NOTE
• For [Area Migration], set the data range of a word address to store each move amount on X Coordinate/Y Coordinate.</td></tr>
<tr><td></td><td></td><td>Min</td><td>Set the range minimum value. The setting range depends on the [Data Type] and [Sign +/-] settings.
<table>
<tr><th>Data Type</th><th>Input Sign</th><th>Input Range</th></tr>
<tr><td>Bin</td><td>Not Selected</td><td>0 to 65534</td></tr>
<tr><td>Bin</td><td>Selected</td><td>32768 to 32766</td></tr>
<tr><td>BCD</td><td>-</td><td>0 to 9998</td></tr>
</table></td></tr>
<tr><td>Move</td><td>Range</td><td>Max</td><td>Set the range maximum value. The setting range depends on the [Data Type] and [Sign +/-] settings.
<table>
<tr><th>Data Type</th><th>Input Sign</th><th>Input Range</th></tr>
<tr><td>Bin</td><td>Not Selected</td><td>1 to 65535</td></tr>
<tr><td>Bin</td><td>Selected</td><td>-32767 to 32767</td></tr>
<tr><td>BCD</td><td>-</td><td>1 to 9999</td></tr>
</table></td></tr>
</table>

◆ Move (for Mark)

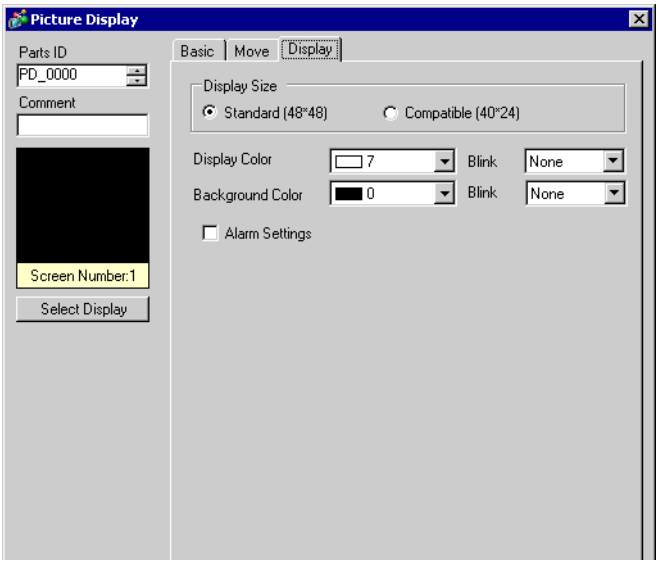


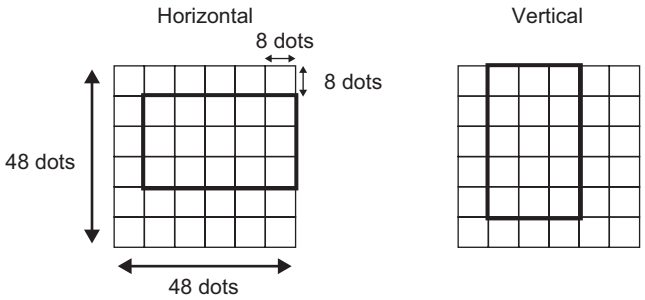
Setting	Description
Display Position Settings	Set a display position for placement.
Number of Display Positions	Set the number of display positions for placement.
Data Type	Select the data type of the control word address to store the display position from "Bin" or "BCD".
Input Range	Set the control word address' data range. Moves and displays data in percentage according to the settings. Data is fixed as binary. The setting range depends on the "Input Sign" settings.  Input Range Min/Max List Input Sign / Min / Max Not Selected: 0 to 65534 / 1 to 65535 2's Complement: 32768 to 32766 / –32767 to 32767 MSB Sign: 32767 to 32766 / –32766 to 32767 **NOTE** • If the input range is not set, a screen is displayed at the data position stored in the control word address.

Continued

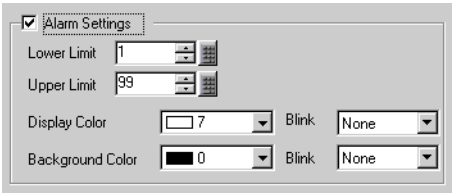
Setting		Description
	Bit Length	Set the valid bit length of the data to store in the word address.
	Input Sign	Select the input sign from [None], [2's Complement], or [MSB Sign].
	Min	Set the input range minimum value.
	Max	Set the input range maximum value.

◆ Display (for Mark)



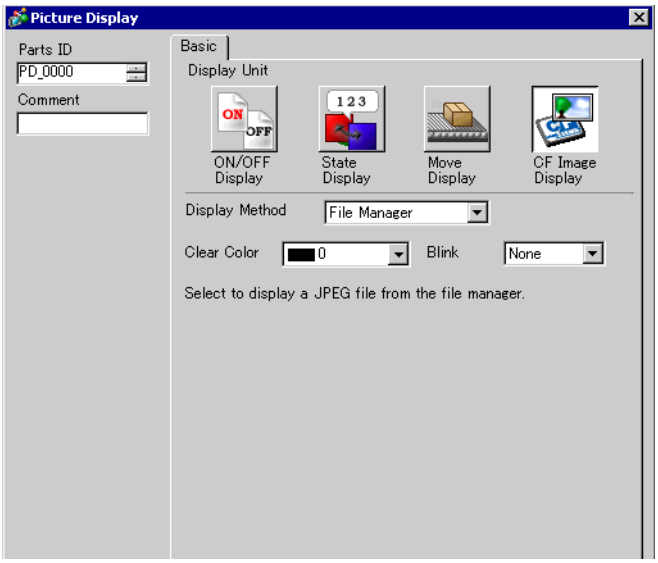
Setting	Description
Display Size	Select the size of a mark screen to display from [Standard (48 x 48)] or [Compatible (40 x 24)]. **NOTE** • Standard Select this when you use a mark created over the bold line borders in the following figures. • Compatible Select this when you use a mark created within the bold line borders in the following figures or a mark created on GP-PRO II/III. 
Display Color	Select a color for the mark to display.
Background Color	Select a background color for the mark to display.

Continued

Setting	Description
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], and [Background Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
Alarm	Set whether or not to use the Alarm. With the alarm settings, you can show that the display position goes over the setting range of the upper limit value/lower limit value by changing the mark screen display color/ background color. 
Lower Limit	Set the alarm lower limit value from 1 to 98.
Upper Limit	Upper Limit Set the alarm upper limit value from 2 to 99.
Display Color	Set a color for the mark to display when the alarm is active.
Background Color	Select a background color for the mark to display when the alarm is active.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], and [Background Color]. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

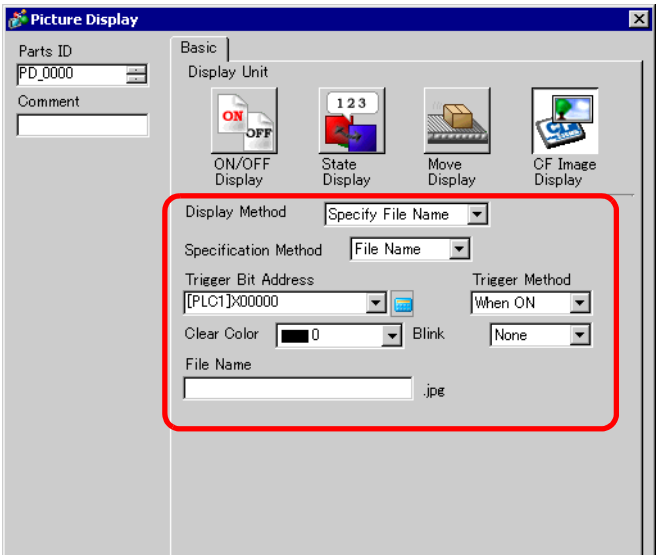
■ CF Image Display

◆ Basic Settings (File Manager)



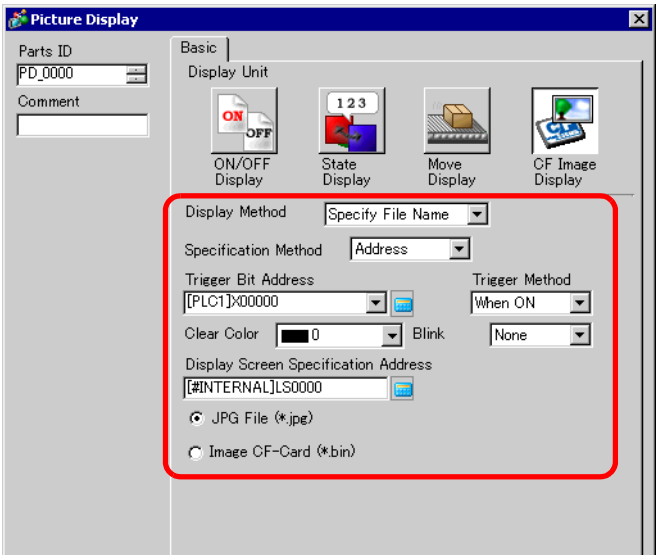
Setting	Description
Display Method	Set the method of displaying a file saved in a CF card.
File Manager	Displays the JPEG file picture with [File Manager] in the special data display. **NOTE** • For more details on the special data display [File Manager]: ☞ "25.10.2 [Special Data Display] Settings Guide ■ File Manager" (page 25-86)
Clear Color	Set the color when there is no image display.
Blink	Select whether or not the Part will blink, and the blink speed. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

◆ Basic Settings (Specify File Name - File Name)



Setting	Description
Display Method	Set the method of displaying a file saved in a CF card.
Specify File Name	Specifies the file name of a JPEG file stored in a CF card and displays the image.
Specification Method	Set the method of specifying a file saved in a CF card.
File Name	Directly specifies an image file name to display and displays the image on the screen.
Triggered Bit Address	Set the bit address which controls the image display.
Triggered Method	Set whether to display an image with the bit address ON or OFF.
Clear Color	Set the color when there is no image display.
Blink	Select whether or not the Part will blink, and the blink speed. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
File Name	Input an image file name to display.

◆ Basic Settings (Specify File Name - Address)



Setting	Description
Display Method	Set the method of displaying a file saved in a CF card.
Specify File Name	Specifies the file name of an image file (BMP or JPEG converted file) or a JPEG file stored in a CF card and displays the image.
Specification Method	Set the method of specifying a file saved in a CF card.
Address	Specifies an image file name to display in the address and displays the image on the screen.
Triggered Bit Address	Set the bit address which controls the image display.
Triggered Method	Set whether to display an image with the bit address ON or OFF.
Clear Color	Set the color when there is no image display.
Blink	Select whether or not the Part will blink, and the blink speed. **NOTE** • There are cases where you can and cannot set Blink depending on the Main Unit and System Setting [Color]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

Continued

<table>
<tr><th>Setting</th><th>Description</th></tr>
<tr><td>Display Screen Specification Address</td><td>Set the address which specifies the image file to display.
NOTE
• Specify the data to store with a full path (folder name and file name). The full path should be 20 single-byte characters (10 words) or less. If it is less than 20 characters, be sure to store "00h" at the end.
• Put " \ " between the folder name and file name in a full path.
• The file name should be 8 single-byte characters or less. Only Bin and JPEG files are supported.
• Only GP internal addresses (LS or USR) can be set in the [Display Screen Specification Address].

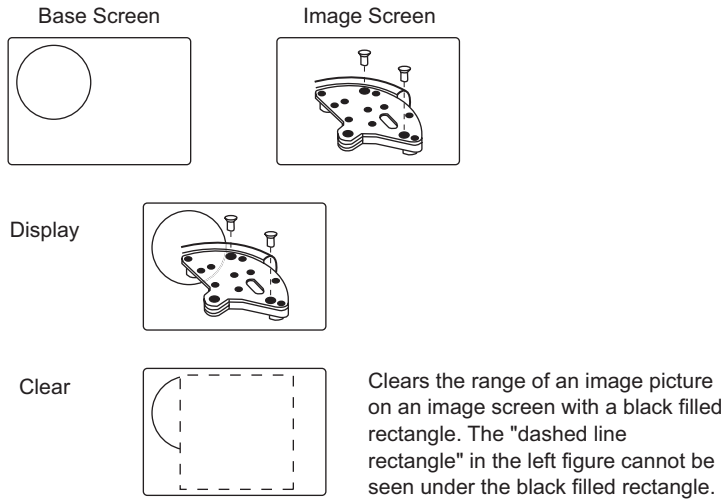
For example, Displaying an image file (LOGO.bin) in the [DATA] folder in a CF card (Display Screen Specification Address: LS1000)
Setting Example
16 bit
LS1000 ‘D’ ‘A’
LS1001 ‘T’ ‘A’
LS1002 ‘\’ ‘L’
LS1003 ‘O’ ‘G’
LS1004 ‘O’ 00h
LS1005 00h 00h
: : :</td></tr>
<tr><td>JPG File (*.jpg)</td><td>Select this when you display a JPG file.</td></tr>
<tr><td>Image CF (*.bin)</td><td>Select this when you specify an image file (∗.bin) saved in a CF Card Export Folder or a CF card.</td></tr>
</table>

10.6 Restrictions

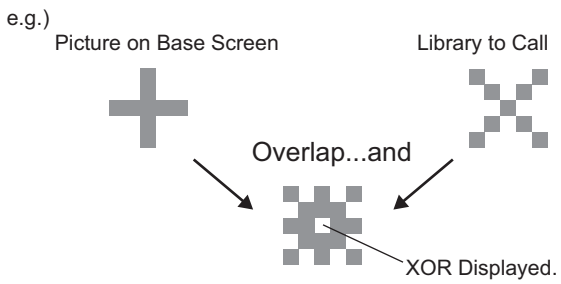
10.6.1 Restrictions for Picture Display (ON/OFF Display)

When the [Screens of Type] is [Base Screen], [Image], or [Image CF Card]

- Screens positioned outside of the display range of the GP as a result of a screen call with a picture display are discarded and not displayed on the screen.
- Picture Display can only call regular pictures or images. You cannot call the type of functions that are available on the Part menu. You can call and display those functions using the Window Display.
  ☞ "18.2 Creating Windows" (page 18-4)
- If you select [Clearing Action] for an image, a rectangular area the size of the image will be cleared to black.



- When you call figures or text with [Clearing Action] selected, if they are overlaid the color of overlapping areas will be different from the specified color. Please exercise caution when you place one color over another.



■ 8 Color Combination

Color Combination Table

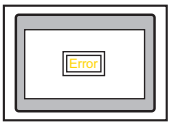
	Blue	Green	Light Blue	Red	Purple	Yel-low	White
Blue	Black	Light Blue	Green	Purple	Red	White	Yel-low
Green	Light Blue	Black	Blue	Yel-low	White	Red	Purple
Light Blue	Green	Blue	Black	White	Yel-low	Purple	Red
Red	Purple	Yel-low	White	Black	Blue	Green	Light Blue
Purple	Red	White	Yel-low	Blue	Black	Light Blue	Green
Yel-low	White	Red	Purple	Green	Light Blue	Black	Blue
White	Yel-low	Purple	Red	Light Blue	Green	Blue	Black

* When the same color overlaps, it becomes "Black".

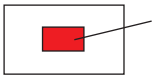
For example,

Picture display on a base screen with the following settings

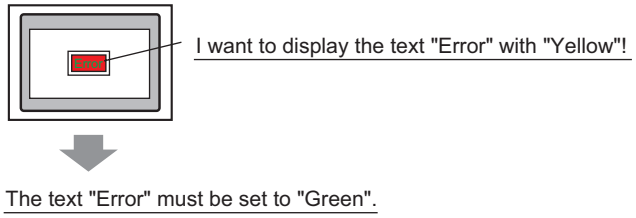
- Picture Display Settings
  - Display Method: ON Display
  - Specify Screen: Constant
  - Screen Type: Base Screen 300



- B300



When the bit turns ON, B300 is displayed and the switch looks reversed.

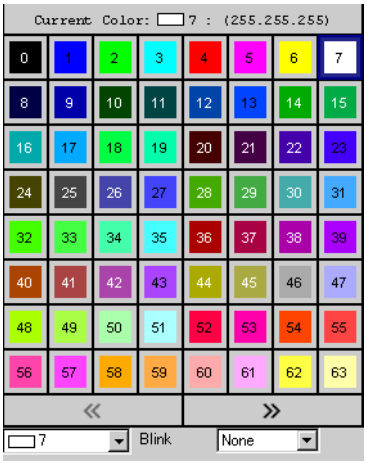


■ For 256 Colors Display

You can calculate the result of two overlapping colors by determining the RGB codes of the overlapping color codes, and performing an XOR operation.

NOTE

- A color code is a value displayed on each color on the palette.



■ Color Codes

RGB Code Table for 256 Colors

Color Code	RGB Code	Color Code	RGB Code	Color Code	RGB Code	Color Code	RGB Code
0	00h	64	6Eh	128	CCh	192	A2h
1	01h	65	7Eh	129	DCh	193	B2h
2	02h	66	7Fh	130	DDh	194	B3h
3	03h	67	6Fh	131	CDh	195	A3h
4	04h	68	2Eh	132	C4h	196	AAh
5	05h	69	3Eh	133	D4h	197	BAh
6	06h	70	3Fh	134	D5h	198	BBh
7	07h	71	2Fh	135	C5h	199	ABh
8	10h	72	82h	136	8Ch	200	E2h
9	11h	73	92h	137	9Ch	201	F2h
10	20h	74	93h	138	9Dh	202	F3h
11	30h	75	83h	139	8Dh	203	E3h
12	31h	76	8Ah	140	84h	204	EAh
13	21h	77	9Ah	141	94h	205	FAh
14	22h	78	9Bh	142	95h	206	FBh
15	32h	79	8Bh	143	85h	207	EBh
16	33h	80	C2h	144	28h	208	EEh
17	23h	81	D2h	145	38h	209	FEh
18	12h	82	D3h	146	39h	210	FFh
19	13h	83	C3h	147	29h	211	EFh
20	40h	84	CAh	148	68h	212	E6h
21	50h	85	DAh	149	78h	213	F6h
22	51h	86	DBh	150	79h	214	F7h
23	41h	87	CBh	151	69h	215	E7h
24	60h	88	CEh	152	6Ch	216	AEh
25	70h	89	DEh	153	7Ch	217	BEh
26	71h	90	DFh	154	7Dh	218	BFh
27	61h	91	CFh	155	6Dh	219	AFh
28	62h	92	C6h	156	2Ch	220	A6h
29	72h	93	D6h	157	3Ch	221	B6h
30	73h	94	D7h	158	3Dh	222	B7h
31	63h	95	C7h	159	2Dh	223	A7h
32	42h	96	8Eh	160	A0h	224	2Ah
33	52h	97	9Eh	161	B0h	225	3Ah
34	53h	98	9Fh	162	B1h	226	3Bh
35	43h	99	8Fh	163	A1h	227	2Bh
36	44h	100	86h	164	A8h	228	6Ah
37	54h	101	96h	165	B8h	229	7Ah
38	55h	102	97h	166	B9h	230	7Bh
39	45h	103	87h	167	A9h	231	6Bh
40	64h	104	0Ah	168	E0h	232	08h
41	74h	105	1Ah	169	F0h	233	18h
42	75h	106	1Bh	170	F1h	234	19h
43	65h	107	0Bh	171	E1h	235	09h
44	66h	108	4Ah	172	E8h	236	48h
45	76h	109	5Ah	173	F8h	237	58h
46	77h	110	5Bh	174	F9h	238	59h
47	67h	111	4Bh	175	E9h	239	49h
48	46h	112	4Eh	176	ECh	240	4Ch
49	56h	113	5Eh	177	FCh	241	5Ch
50	57h	114	5Fh	178	FDh	242	5Dh
51	47h	115	4Fh	179	EDh	243	4Dh
52	14h	116	0Eh	180	E4h	244	0Ch
53	15h	117	1Eh	181	F4h	245	1Ch
54	24h	118	1Fh	182	F5h	246	1Dh
55	34h	119	0Fh	183	E5h	247	0Dh
56	35h	120	C0h	184	ACh	248	90h
57	25h	121	D0h	185	BCh	249	91h
58	26h	122	D1h	186	BDh	250	81h
59	36h	123	C1h	187	ADh	251	88h
60	37h	124	C8h	188	A4h	252	98h
61	27h	125	D8h	189	B4h	253	99h
62	16h	126	D9h	190	B5h	254	89h
63	17h	127	C9h	191	A5h	255	80h

For example,

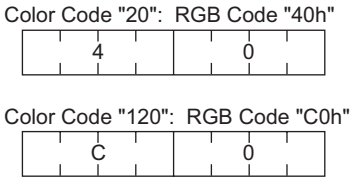
Overlapping the color codes "20" and "120"

Look up each RGB code of each color in the "256 Colors RGB Code Table" on the previous page.

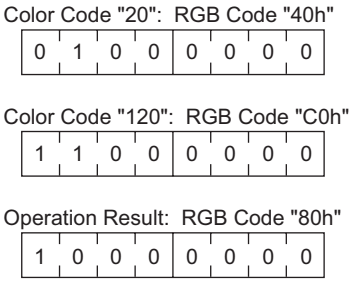
Color Code "20": RGB Code "40h"

Color Code "120": RGB Code "C0h"

Their data on the GP are as follows.



Operate by XOR for XOR display.

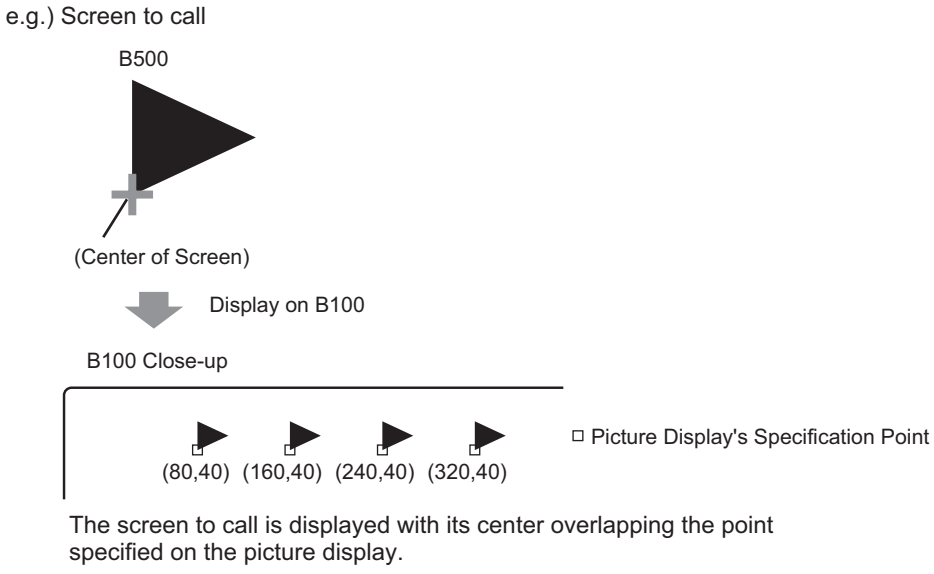


From the operation result, when overlapping the color codes "20" and "120", a color with the following color code is displayed.

Color Code "255": RGB Code "80h"

- When you select [Base Screen], [Image], or [Image CF Card] in [Screens of Type], the Picture Display will place the display position pointer on the screen. This pointer determines the center of the screen you want to call.

e.g.) Screen to call



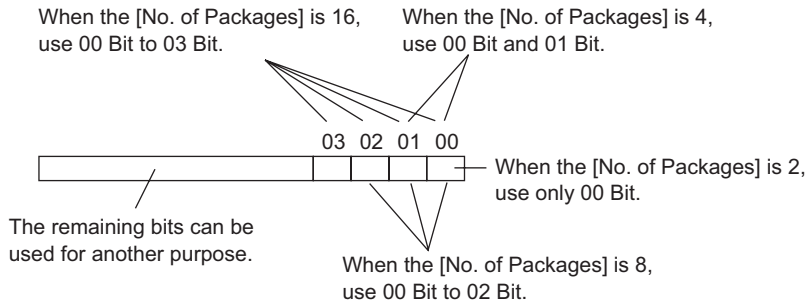
The screen to call is displayed with its center overlapping the point specified on the picture display.

- With [Clearing Action] selected, pictures using two or more of the same dots in the drawing process (3-dot or 5-dot lines, lines with 2-dot arrow, or raised characters, etc.) cannot be normally displayed on a screen to display.
- If the overlapping target is image font, it will not have the XOR display.
- Only when the [Screens of Type] is [Mark] and the [Specify Screen] is [Constant], can you set watermark to the background color both When Bit is ON and When Bit is OFF.

10.6.2 Restrictions for Picture Display (State Display)

When the [Screens of Type] is [Package]

- Pictures to be called change in response to the state changes of sequential bits starting from the 00 bit in the specified word address. In response to the [Number of Packages] (2, 4, 8, or 16), bits are automatically assigned from the specified word address 00 bit.



- If a state where a package has not been defined is designated, the Picture Display will show nothing. For example, when the [Number of Packages] is 16 and only states 0 to 3 actually have a package registered, designating states 4 to 15 displays only the background rectangular border.

When the [Screens of Type] is [Base Screen], [Image], or [Image CF Card]

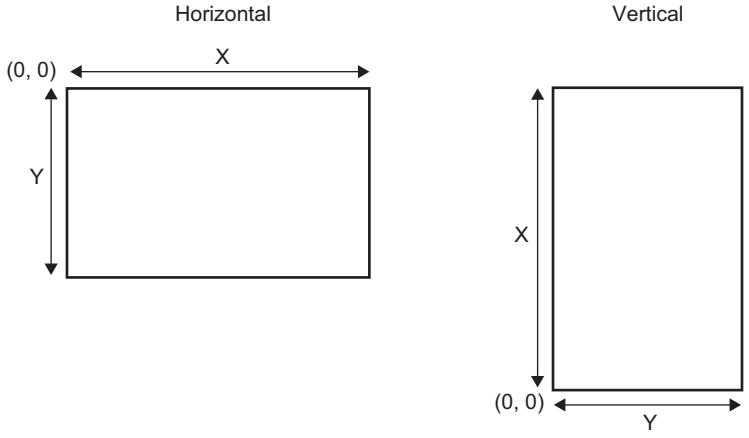
- The picture display places the display position specification point on the screen. The specification point is placed with reference to the center of a screen you want to call. The screen to call is displayed with its center overlapping the point specified on the picture display.

10.6.3 Restrictions for Picture Display (Move Display)

- When you operate two or more picture displays with move displays on the same screen, the move displays should not be overlapped. With move displays overlapped, picture displays may not be properly displayed.

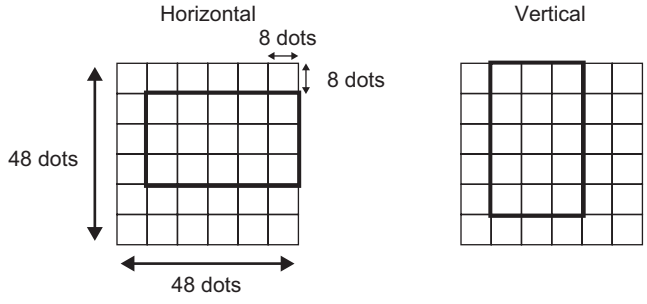
When the [Screens of Type] is [Base Screen], [Image], or [Image CF Card]

- If another picture is already drawn at the location where you move and display a screen picture, the overlapping part of the called screen and the picture will have the XOR display.
- Pictures with lines of 3-dot to 9-dot thickness cannot be placed on the screen to display.
- When portrait is selected as the orientation, the [Area Migration] coordinate system is as follows.

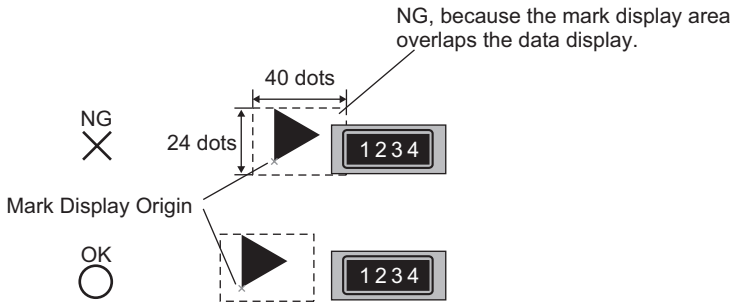


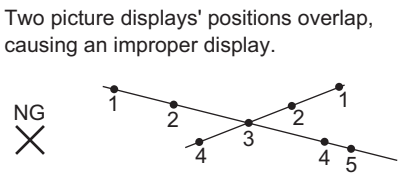
When the [Screens of Type] is [Mark]

- When the [Specify Screen] is [Address] and multiple marks are used, select the [Display Size] - [Standard 48∗48] on the Picture Display [Display] tab if a mark has been created on the bold line borders in the following figures.



- If a mark screen shown in a picture display overlaps another part, it may not be properly displayed. Overlapping positions set on multiple picture displays also cause an improper display.





- You cannot display the marks at two or more locations at the same time on one picture display.
- Marks are not displayed when the display position data [Control Word Address] is 0.
- If the set display position intervals are small and the marks' display areas overlap each other, the marks are displayed improperly. In setting a display position, make enough intervals taking a mark display area into account.
- When the [Specify Screen] is [Address] and marks of different sizes are called, if a smaller mark is called after a larger mark, the previous mark may remain on the screen.
- For the picture display, when the Move Display [Screens of Type] is [Mark], you can place up to 30 marks on one screen. You can set 99 display positions on one picture display. The total number of display positions per screen should be within 512.

10.6.4 Restrictions for Picture Display (CF Image Display)

- JPEG files inside the CF card can only be displayed at up to 1024 x 768 pixels.
- If you clear a displayed JPEG file image with the special data display [File Manager], the image will remain displayed. The image is cleared by overwriting with screen change or another image.
- You can display only one picture display interacting with a file manager on a screen. When multiple picture displays are displayed at a time by placing them on a window screen, they act in the following priority order.
  1. Ones placed on a base screen
  2. Ones placed on a local window
  3. Ones placed on a global window
- For a JPEG file, the image is displayed with reference to the top-left corner of the display area. However, if an image is larger than the display area, only the portion that falls into the display area from the top-left corner is displayed. With update display, the display area is filled with the clear color.
- Displayed JPEG files cannot be automatically erased. JPEG files that are displayed when the Triggered Bit Address turns ON (or OFF) will remain displayed even when the Triggered Bit Address turns OFF (or ON).
- For JPEG files in the CF card, even if the [Orientation] is changed and the Picture Display is rotated, the JPEG files will not appear rotated. If you want to rotate and display a picture, please load an image into the CF card that has already been rotated.

When the [Display Method] is [Specify File Name], and the [Specification Method] is [Address]

- Specify the data to store with a full path (folder name and file name). The full path should be 20 single-byte characters (10 words) or less. If it is less than 20 characters, be sure to store "00h" at the end.
- Put " \ " between the folder name and file name in a full path.
- The file name should be 8 single-byte characters or less. Only Bin and JPEG files are supported.
- Only GP internal addresses (LS or USR) can be set in the [Display Screen Specification Address].