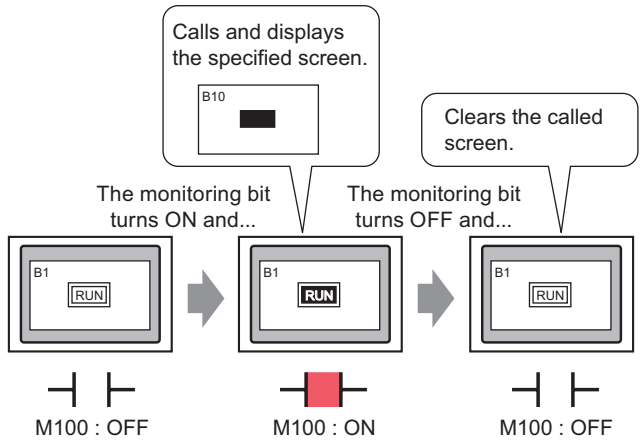
10 Picture Display

This chapter explains basic features of the GP-Pro EX “Picture Display” and the basic ways of setting up a Picture Display. Please start by reading “10.1 Settings Menu” (page 10-2) and then turn to the corresponding page.

10.1 Settings Menu

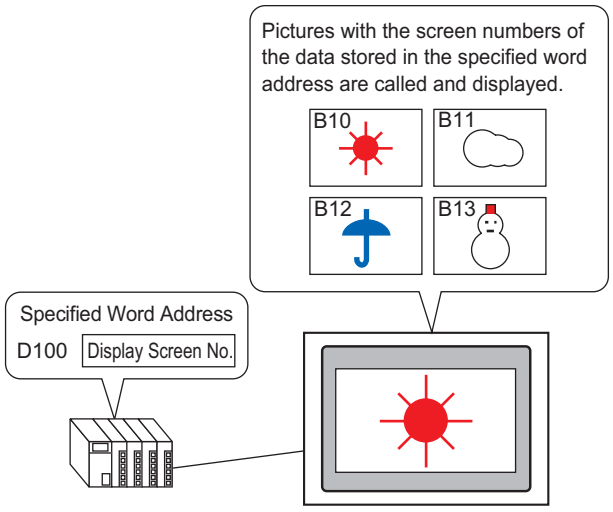
Changing a Picture with Bit ON/OFF



Displays/hides a picture on the screen according to the bit change.

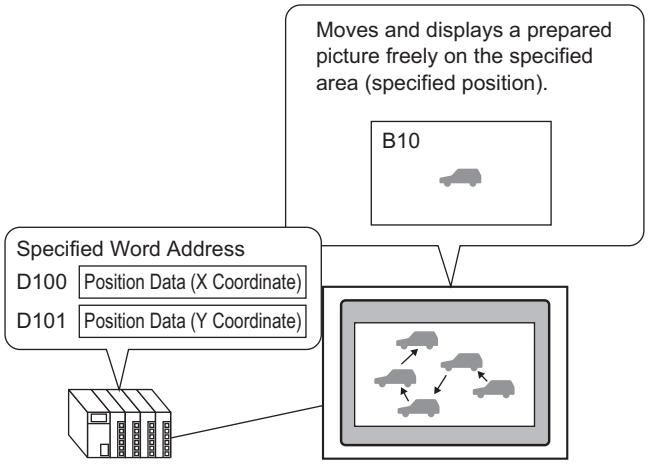
☞ Setup Procedure (page 10-5)
☞ Details (page 10-4)

Changing and Displaying Multiple Pictures



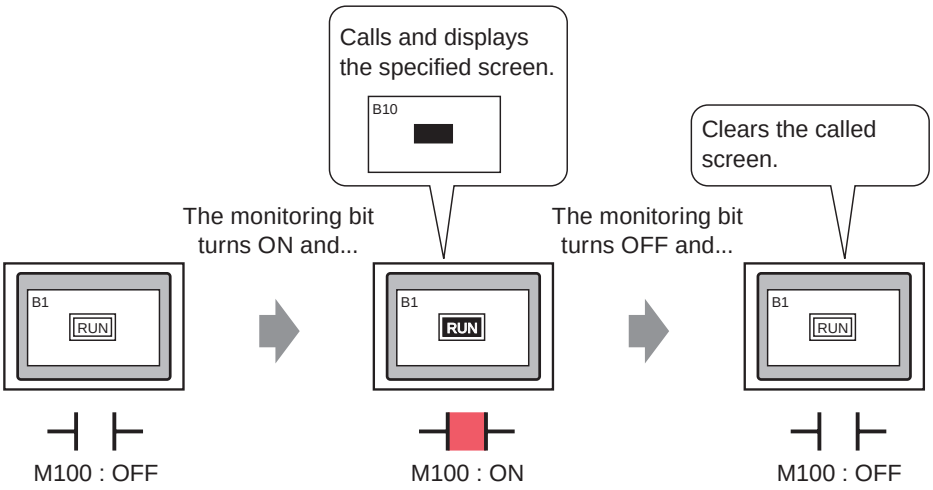
Changes and displays pictures on the screen according to the situation.

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

Moving the Picture Display	
 Moves and displays a picture on the screen according to the situation.	☞ Setup Procedure (page 10-18) ☞ Details (page 10-17)

10.2 Changing a Picture with Bit ON/OFF

10.2.1 Details

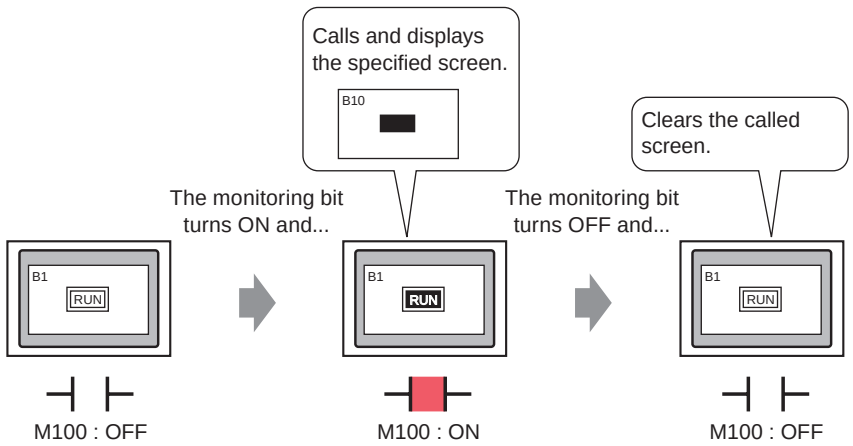


You can call and display pictures from other screens depending on the state of the specified bit address.

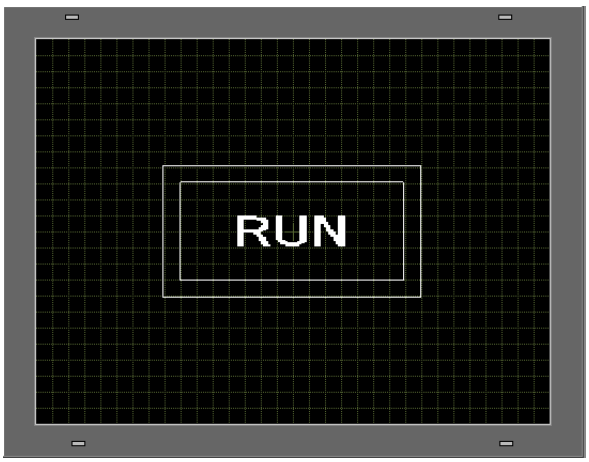
10.2.2 Setup Procedure

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 "Part Editing Procedure".
  ☞ "9.6.1 Editing Parts" (page 9-37)

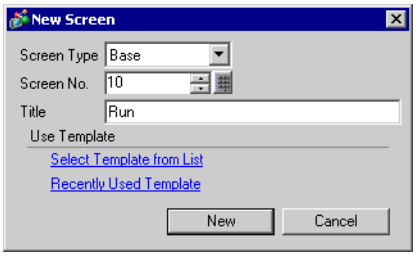


1 Create a call destination screen. (e.g.: Base 1)

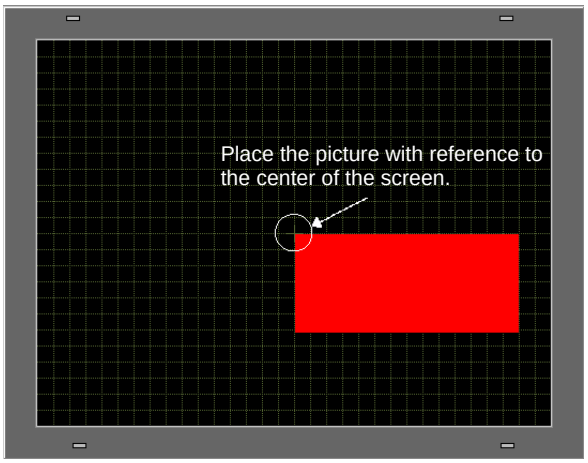


2 Select the [Screen (S)] menu - [New Screen (N)] command or click .

3 Set the [Screen Type] (e.g.: Base) and the [Screen No.] (e.g.: 10), and click [New].



4 Create a screen to be called. When you call the filled rectangle created here (e.g.: Copy a rectangle of the same size as the rectangle inside the picture on [Base 1] and set the fill color as red.) with a picture display, the color of the part overlapping with the picture on the call destination screen changes, and the picture appears to have been switched.

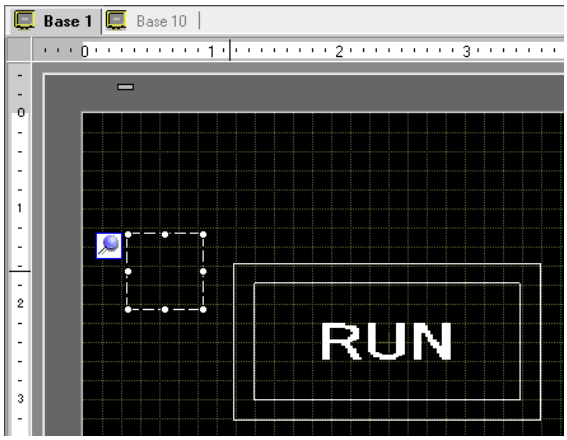


NOTE

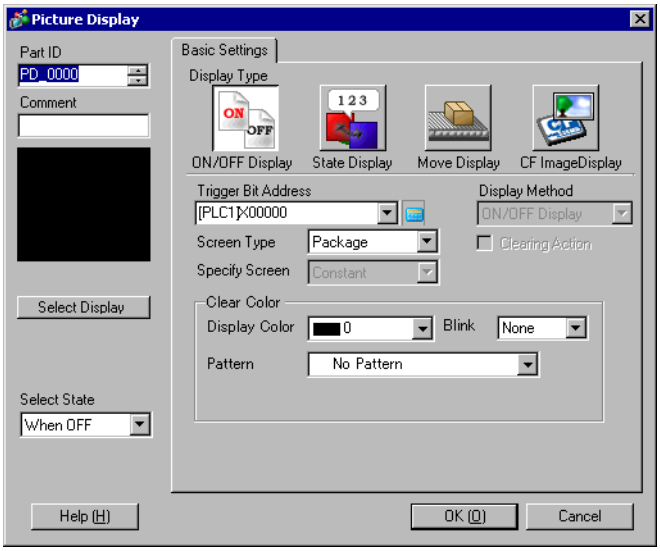
- When [Clearing Action] is set for a picture display's [ON/OFF Display], the display color may change because the screen background color overlaps with the color of the called picture.

  ☞ " ■ 8 Color Combination" (page 10-49)
- A screen is called with reference to the center of the drawing area. If you draw a picture with reference to the center, it is easier to specify a picture display's position when you place it on the call destination screen.

5 Click the [Base 1] tab and select the [Part (P)] menu - [Picture Display (F)] command or click , and place the picture display on the screen.



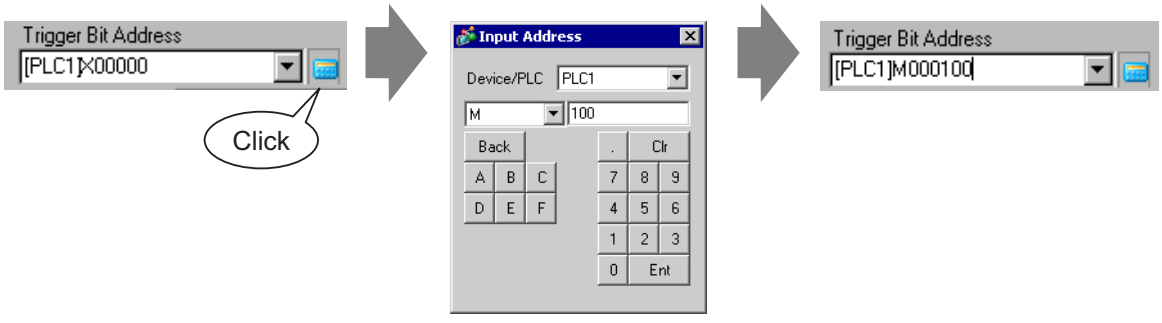
6 Double-click the placed rectangle's dotted border to open the setting dialog box.



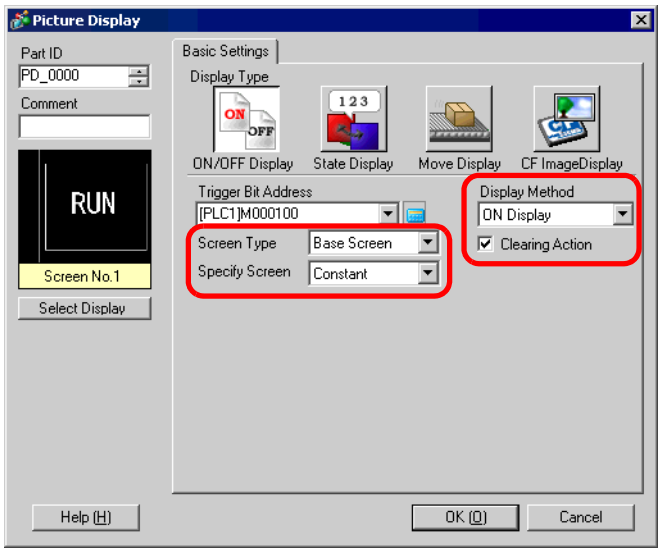
7 Select [ON/OFF Display] and set the [Trigger Bit Address] (e.g.: M100).

Click the icon to display an address input keypad.

Select the device "M", input "100" in the address, and press the "Ent" key.



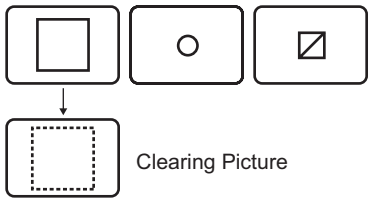
8 Set the [Screen Type], [Specify Screen], [Display Method], and [Clearing Action]. (e.g.: [Screen Type] Base Screen, [Specify Screen] Constant, [Display Method] ON Display, [Clearing Action] checked)



NOTE

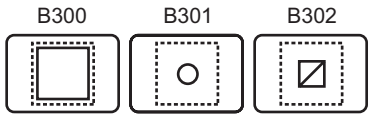
- If [Clearing Action] is not selected and you display pictures of different sizes by turning them ON or OFF, the pictures already displayed will not disappear. Instead, new pictures will be overlaid. To avoid visible overlapping, create a background for clearing with the following procedure:

● Pictures you want to call

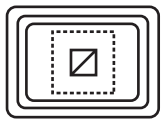


Clearing Picture

(1) Draw a background “filled rectangle” with the size of the largest of the pictures you want to call.



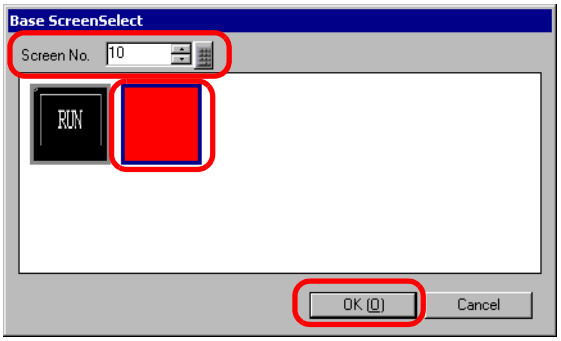
(2) Draw each of the pictures on the “filled rectangle”.



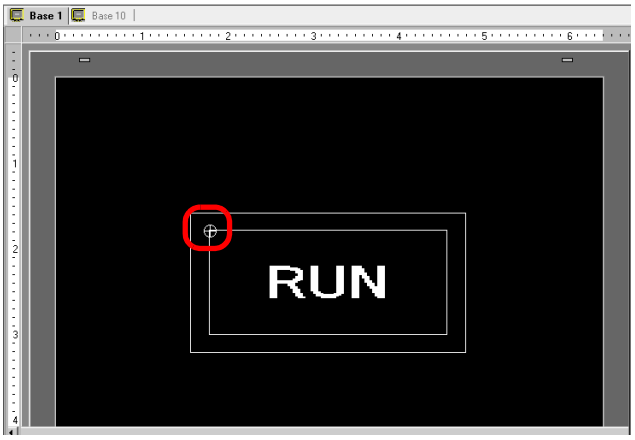
In fact "B300" and "B301" are also displayed but cannot be seen under "B302".

When you call the pictures with a picture display, it looks as if only the picture with the screen number you called just now is displayed.

9 Click [Select Display], select the screen to call (e.g.: 10), and then click [OK].



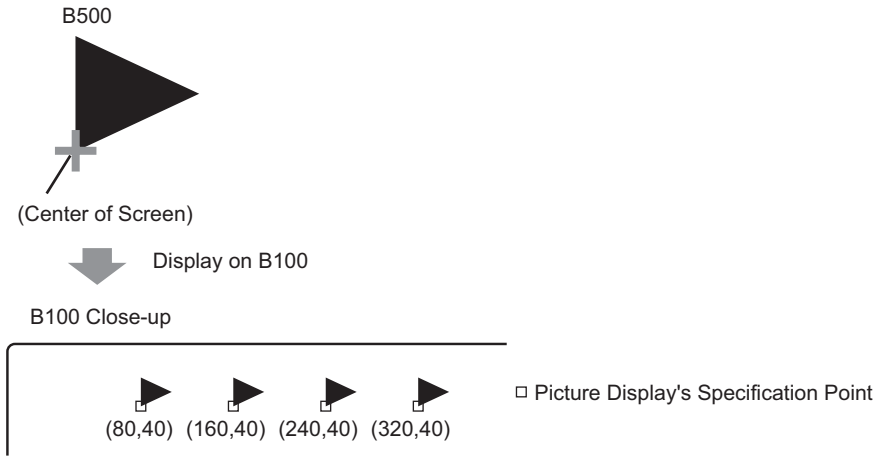
10 The setting dialog box appears again. Click [OK]. When  is displayed on the screen, specify the picture display's display position.



NOTE

- If you selected [Base Screen], [Image], or [Image CF-Card] in [Screen 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.

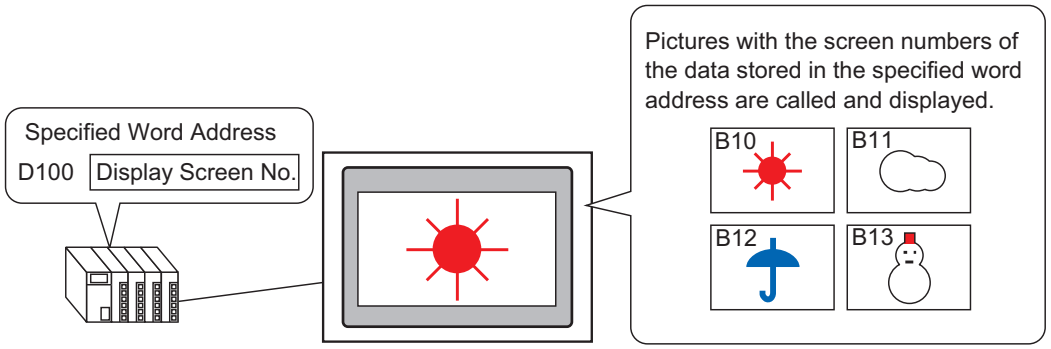
e.g.) Screen to call



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

10.3 Changing and Displaying Multiple Pictures

10.3.1 Details

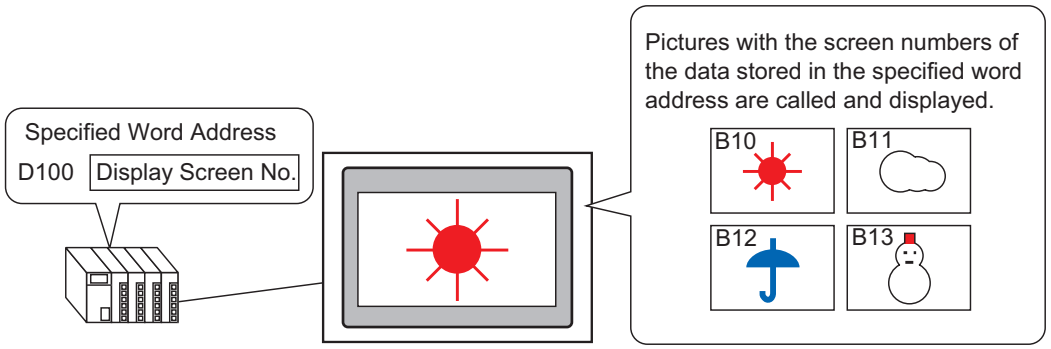


You can call and display pictures by their screen numbers stored in the specified word address.

10.3.2 Setup Procedure

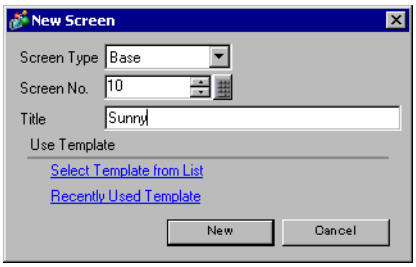
NOTE

- 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 "Part Editing Procedure".
  ☞ "9.6.1 Editing Parts" (page 9-37)

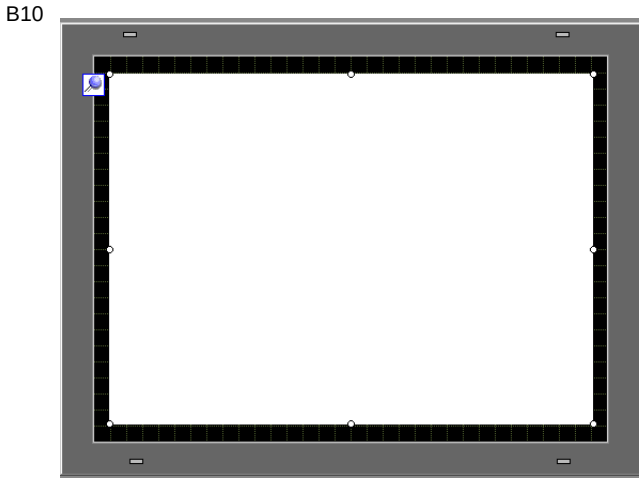


1 Select the [Screen (S)] menu - [New Screen (N)] command or click .

2 Set the [Screen Type] (e.g.: Base) and the [Screen No.] (e.g.: 10), and click [New].

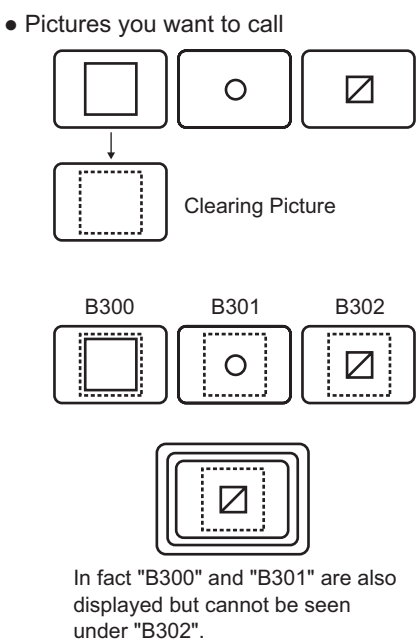


3 Create a background on the screen to be called.



NOTE

- In the State Display, when you change screens you want to call, new pictures will be overlaid. To avoid visible overlapping, create a background in the calling screen to clear the previous picture.



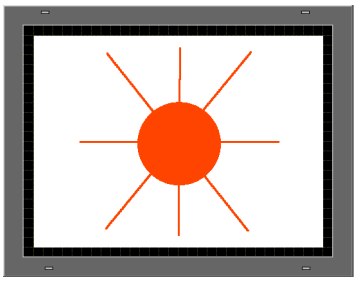
(1) Draw a background “filled rectangle” with the size of the largest of the pictures you want to call.

(2) Draw each of the pictures on the “filled rectangle”.

When you call the pictures with a picture display, it looks as if only the picture with the screen number in the word address is displayed.

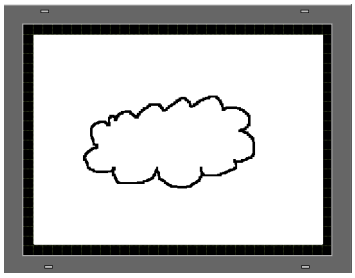
4 Create a picture on the screen to be called.

B10

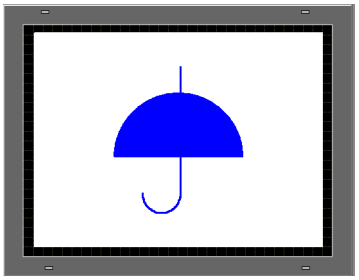


5 Create other screens to be called (e.g.: Base 11, Base 12, and Base 13) using Steps 1-4.

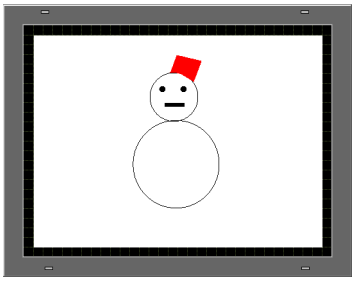
B11



B12



B13

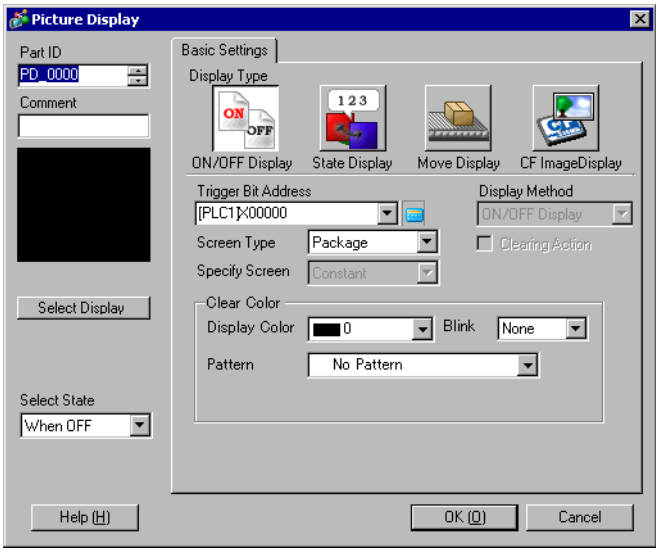


NOTE

- A screen is called with reference to the center of the drawing area. If you draw a picture with reference to the center, it is easier to specify a picture display's position when you place it on the call destination screen.

6 Click the [Base 1] tab and select the [Part (P)] menu - [Picture Display (F)] command or click  , and place the picture display on the screen.

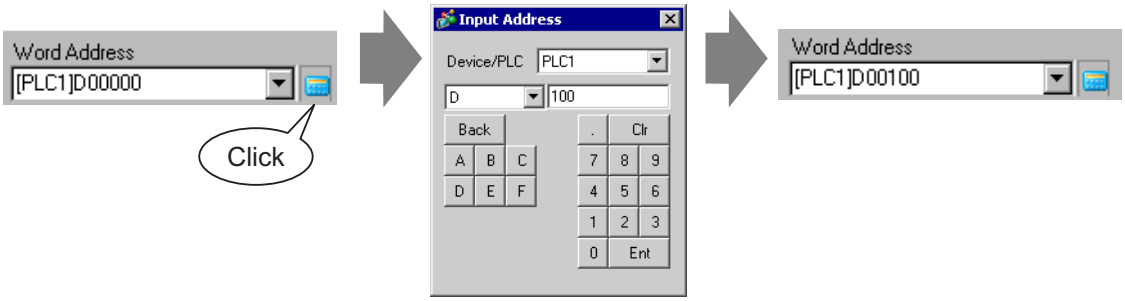
7 Double-click the placed picture display and the setting dialog box will be displayed.



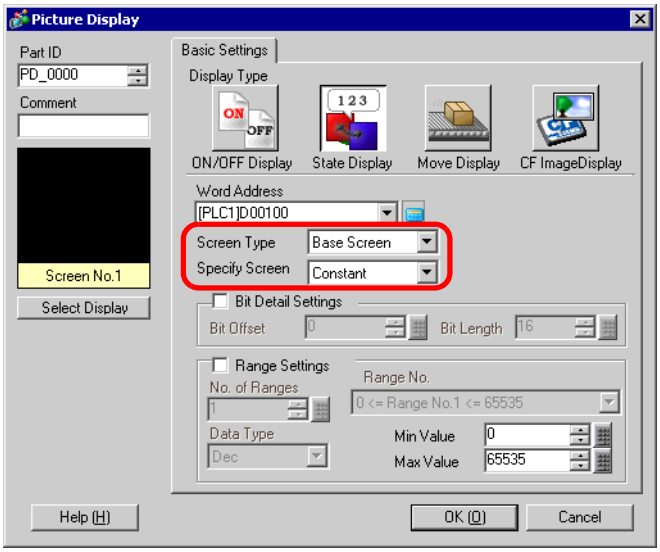
8 Select [State Display] and set the [Word Address] (e.g.: D100).

Click the icon to display an address input keypad.

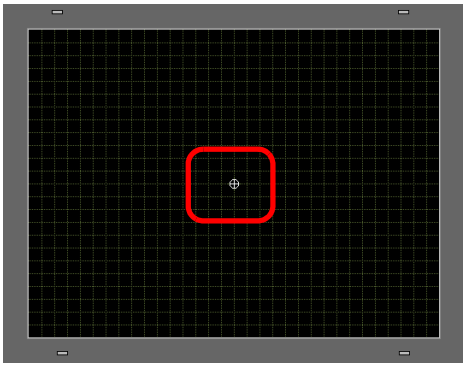
Select device “D”, input “100” as the address, and press the “Ent” key.



9 Set the [Screen Type] and [Specify Screen]. (e.g.: [Screen Type] Base Screen, [Specify Screen] Constant)



10 Click [OK] to specify the picture display's display position.



NOTE

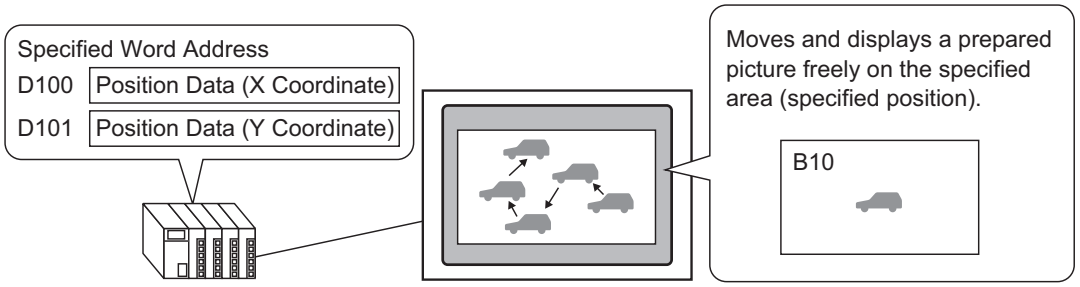
- If you selected [Base Screen], [Image], or [Image CF-Card] in [Screen Type], the Picture Display will place the display position pointer on the Screen. This pointer determines the center of the screen you want to call.

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 the Picture Display

10.4.1 Details

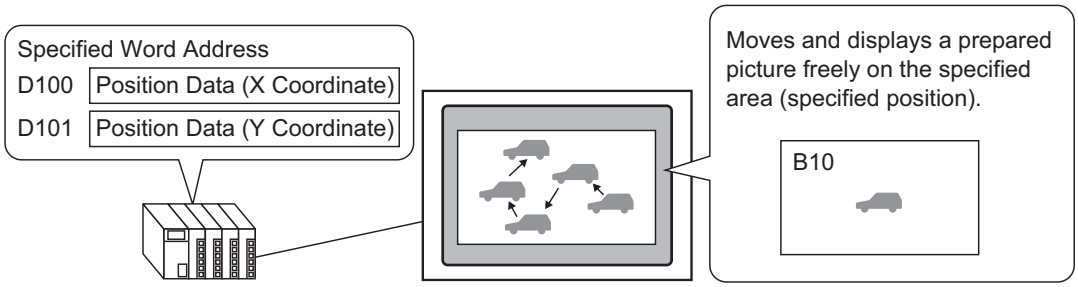


You can store an X-coordinate and Y-coordinate in the specified word addresses so that you can call a picture from another screen and display it in this position. You can also move the display on the line between the two points.

10.4.2 Setup Procedure

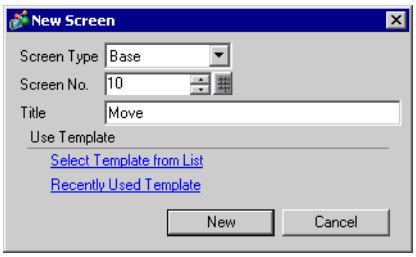
NOTE

- 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 "Part Editing Procedure".
  ☞ "9.6.1 Editing Parts" (page 9-37)

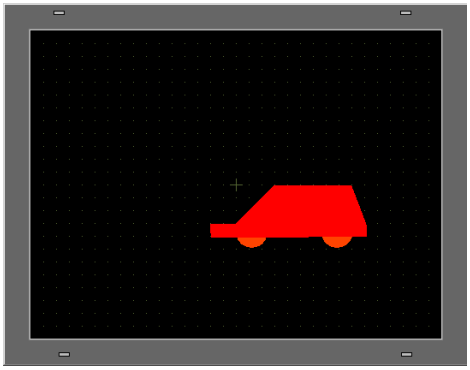


1 Select the [Screen (S)] menu - [New Screen (N)] command or click .

2 Set the [Screen Type] (e.g.: Base) and the [Screen No.] (e.g.: 10), and click [New].



3 Create a screen to be called.

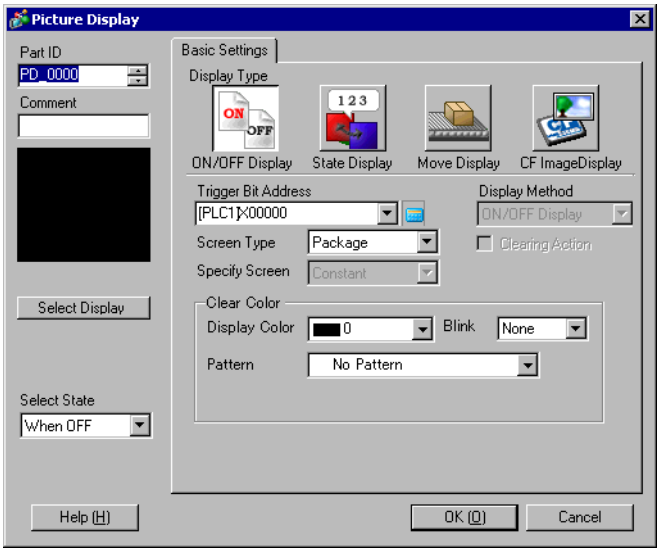


NOTE

- A screen is called with reference to the center of the drawing area. If you draw a picture with reference to the center, it is easier to specify a picture display's position when you place it on the call destination screen.

4 Click the [Base 1] tab and select the [Part (P)] menu - [Picture Display (F)] command or click  , and place the picture display on the screen.

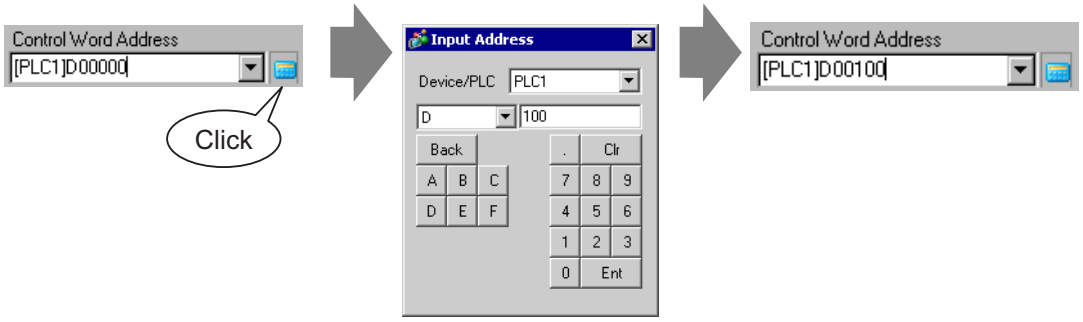
5 Double-click the placed picture display and the setting dialog box will be displayed.



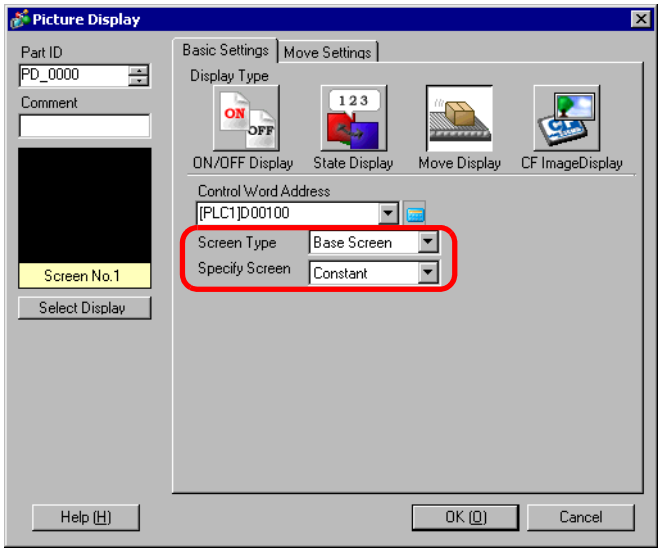
6 Select [Move Display] and set the [Control Word Address] (e.g.: D100).

Click the icon to display an address input keypad.

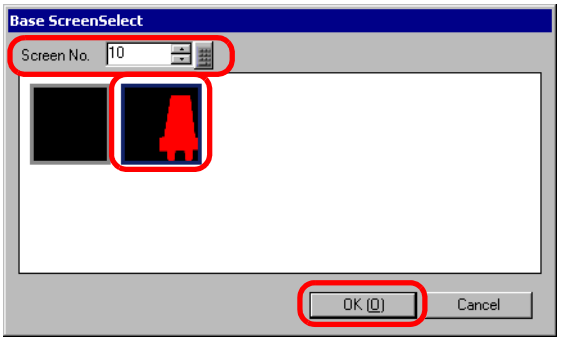
Select device “D”, input “100” as the address, and press the “Ent” key.



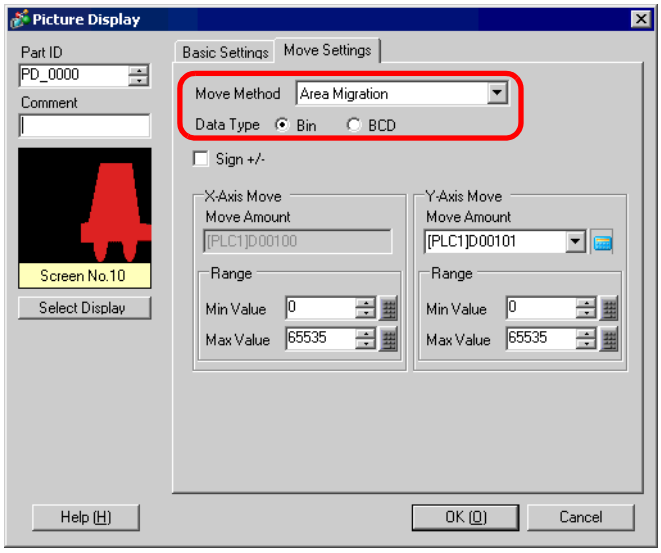
7 Set the [Screen Type] (e.g.: Base Screen) and the [Specify Screen] (e.g.: Constant).



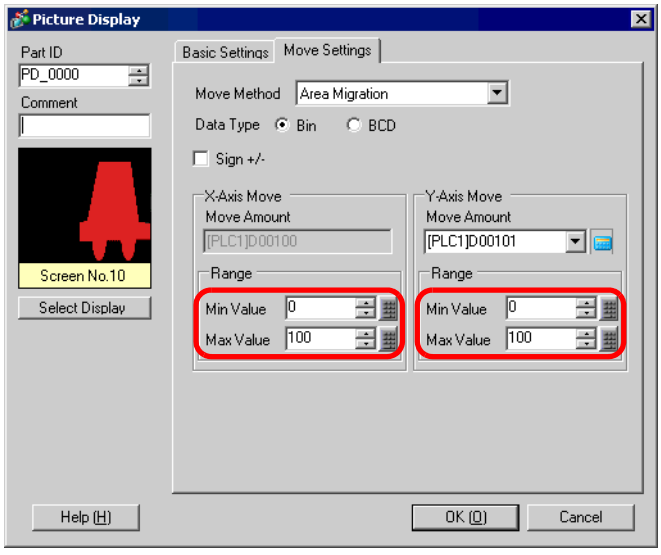
8 Click [Select Display], set the [Screen No.] (e.g.: 10), and then click [OK].



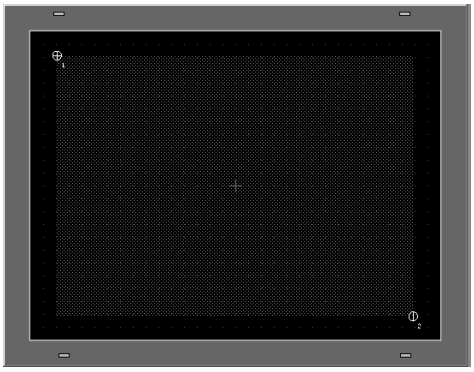
9 In the dialog box, click the [Move Settings] tab and select the [Move Method] and the [Data Type]. (Example: [Move Method] - Area Migration, [Data Type] - Bin)



10 Set the move range maximum value and minimum value for [X-Axis Move] and [Y-Axis Move]. (e.g.: X-Axis Move [Max Value] 100 [Min Value] 0, Y-Axis Move [Max Value] 100 [Min Value] 0)

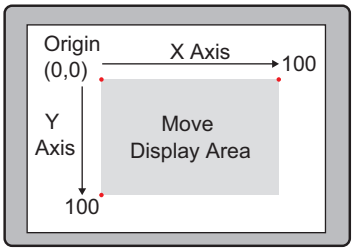


11 Click [OK], then specify the picture display's display area and place it.



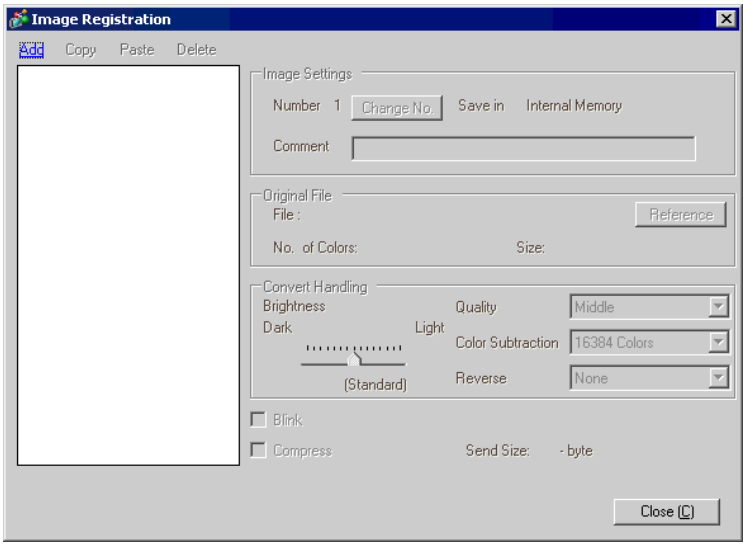
NOTE

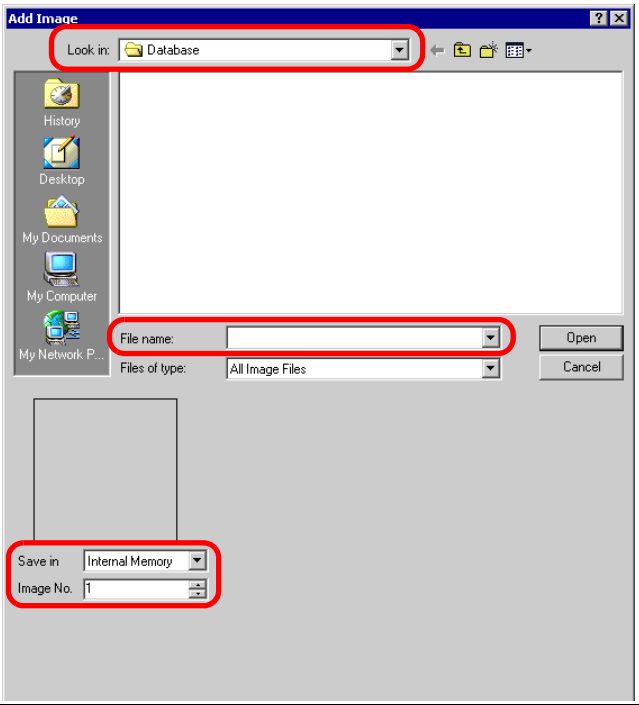
- In the example, move distance in the X and Y direction would be as follows:



10.5 Settings Guide

10.5.1 Setup Guide for Common Settings (Image Registration)



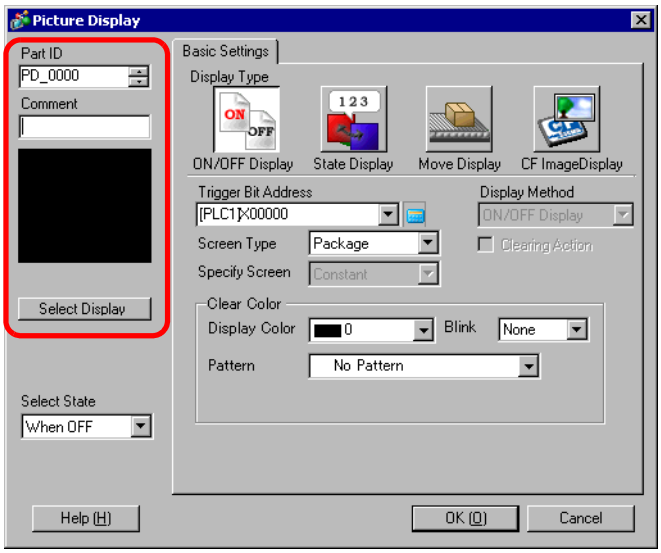
Setting	Description
Add	The [Add Image] dialog box appears. Specify [Look in], [File name], [Save in] and [Image No.] to add an image. 
Copy	Copies the selected image data.
Paste	Pastes copied image data.
Delete	Deletes the selected image data.
List of images	Displays a list of the set images.

Continued

Setting		Description
Image Settings		Displays the information set for the image.
	Number	Displays the number set for the image.
	Change No.	Change the image No. 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.
	No. of Colors	Displays the number of image colors, by the number of bits.
	Size	Displays the image's width and height in pixels.
Convert Handling		Used to convert the image.
	Brightness	Adjusts the image's brightness.
	Quality	Sets the image quality. Select [No Adjustment], [Coarse], [Middle] or [Fine].
	Color Subtraction	Reduces the number of image colors.
	Reverse	Reverses the image's display orientation. Select [None], [Flip Vertical] or [Flip Horizontal].
Blink		Sets image blink.
Compress		Compresses the image's size.
Send Size		Displays the image's size in bytes.

10.5.2 Setup Guide for Picture Display

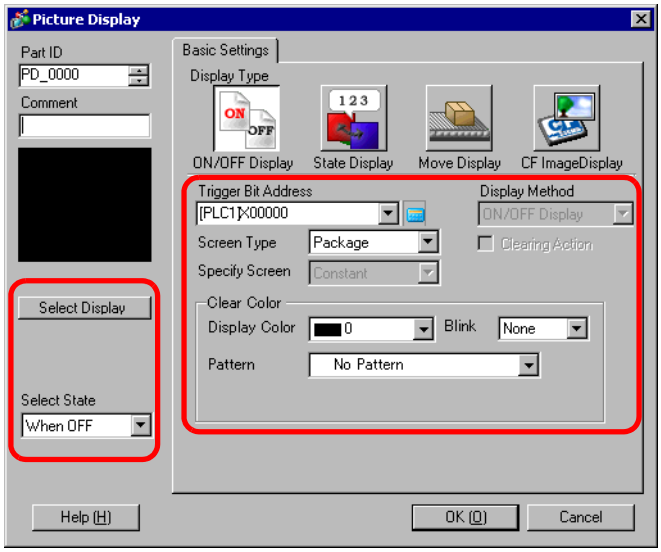
■ Common to all Parts

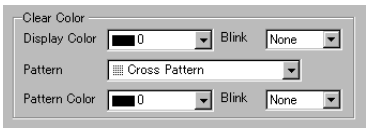
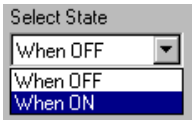


Setting	Description
Part ID	Placed parts are automatically assigned an ID number. Picture Display ID: PD_(4-digit numbers) The letter portion of the ID is fixed and depends on the Part. The number portion can be changed. The value ranges from 0000 to 9,999.
Comment	The comment for each Part can be up to 20 characters long.
Select Display	You can select a screen to be called with a picture display.

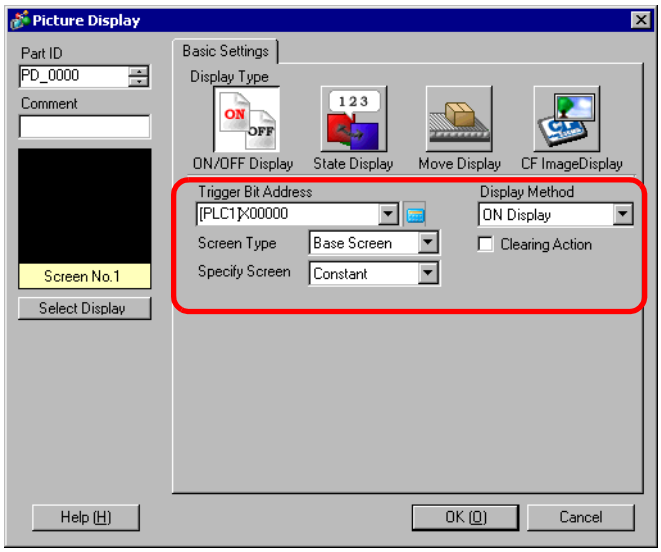
■ ON/OFF Display

◆ Basic Settings (for Package)



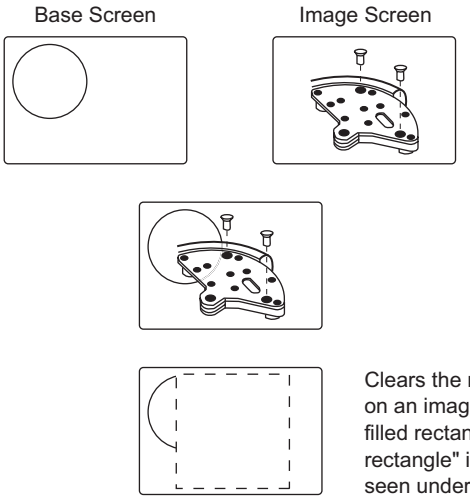
Setting	Description
Trigger Bit Address	Specify the Bit Address to monitor (monitoring bit).
Screen Type	Select the screen type to display.
Package	Displays a picture registered in [Package].
Clear Color	Set the background color for a picture registered in [Package]. 
Display Color	Set the background 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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
Select Display	Select a picture registered in [Package].
Select State	Select an either state of When ON/When OFF, click [Select Display], and specify a picture to display. 

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

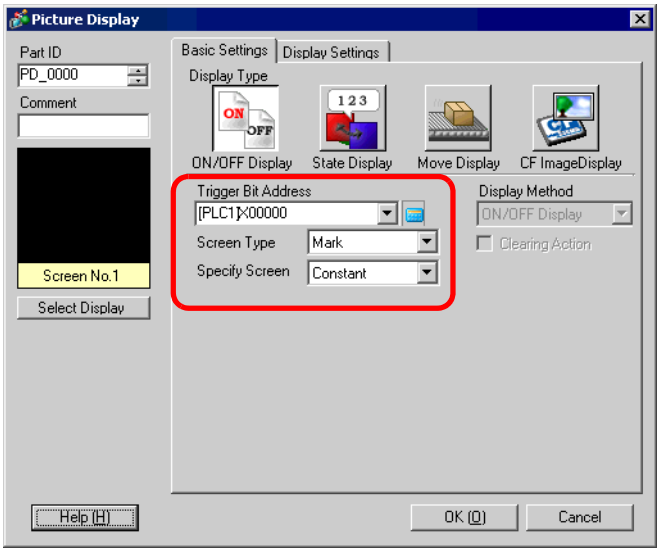


Setting	Description
Trigger Bit Address	Specify the Bit Address to monitor (monitoring bit).
Display Method	Select the display method from [ON Display] or [OFF Display].
ON Display	Displays a screen picture with the Trigger Bit Address turned ON.
OFF Display	Displays a screen picture with the Trigger Bit Address turned OFF.
Screen 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 Word 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 9,999. A screen picture with the offset value added to the screen number stored in the display screen number address will be displayed.

Continued

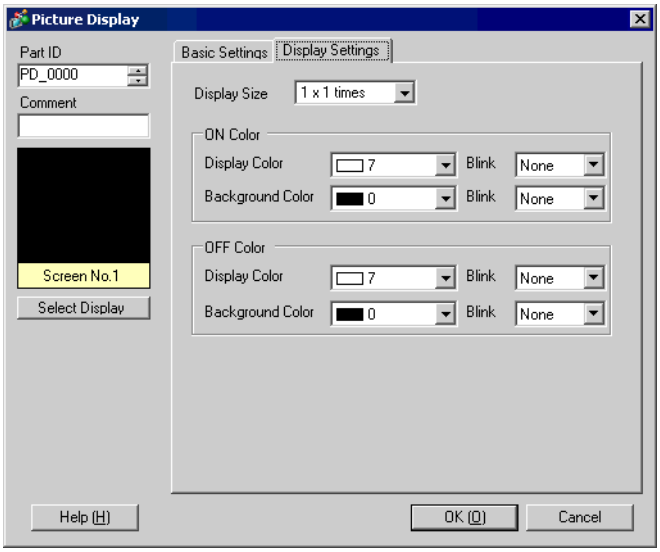
Setting	Description
Clearing Action	If this box is checked, the screen picture will change between the Display/Hide according to the Trigger Bit Address change. If this box is unchecked, a displayed screen picture will not disappear. **NOTE** • If you want to call and display figures or texts of the 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 10-48) • If the overlapping target is image font, it will not have the XOR display. • If you display an image screen with "Clearing Action: checked", the display will be overwritten and the clearing will overwrite the image screen's display range with black.  Clears the range of an image picture on an image screen with a black filled rectangle. The "dashed line rectangle" in the left figure cannot be seen under the black filled rectangle. • 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
Trigger Bit Address	Specify the Bit Address to monitor (monitoring bit).
Screen 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 Address. 
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.

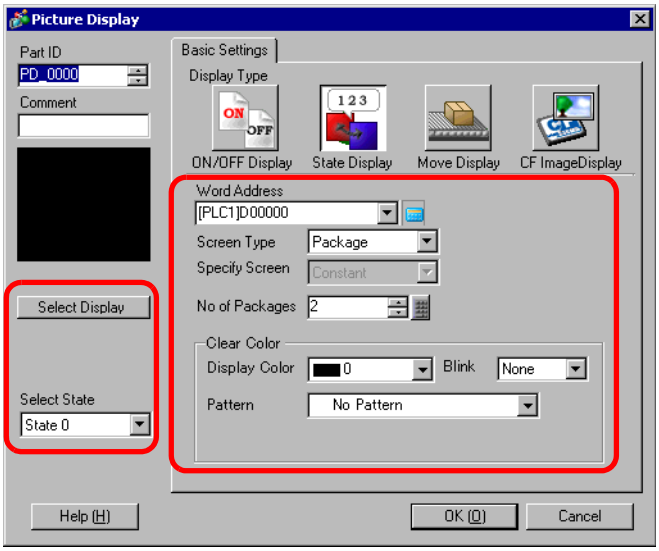
◆ Display Settings (for Mark)

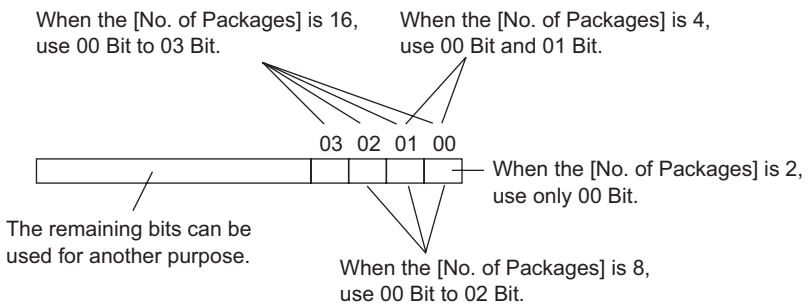


Setting		Description
Display Size		Set the display size of a picture registered in the Mark Screen. Set within the range of minimum size (1 × 1) and maximum size (8 × 8).
ON Color		Set the mark's color to display when the trigger bit address turns ON.
	Display Color	Select a color for the mark to display.
	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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)
OFF Color		Set the mark screen's 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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

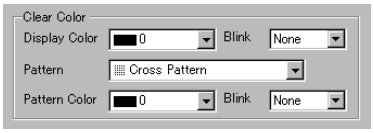
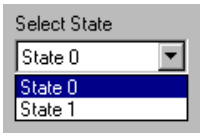
■ State Display

◆ Basic Settings (for Package)

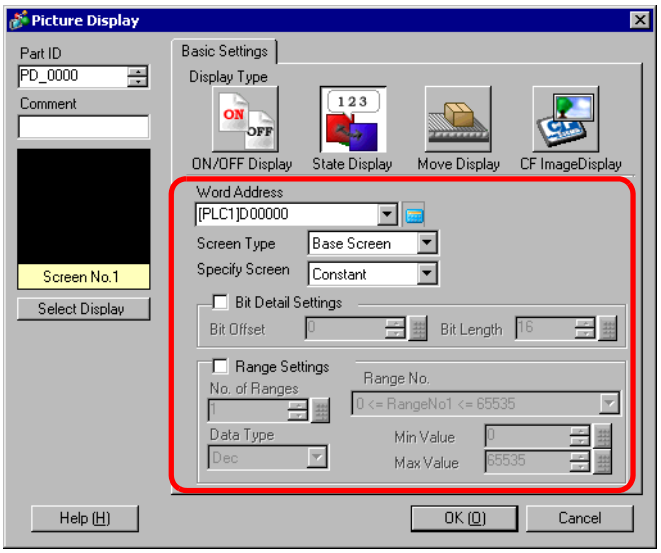


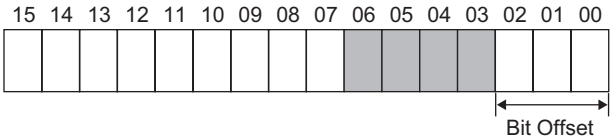
Setting	Description
Word Address	Set the word address to change display. Screens are changed and displayed according to the set word address data changes.
Screen Type	Select the screen type to display.
Package	Displays a picture registered in [Package].
Specify Screen	Fixed with “Constant”. Specify the package to display from [Select Display].
No. 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 [No. of Packages], bits are automatically assigned from the specified word address 00 bit. 

Continued

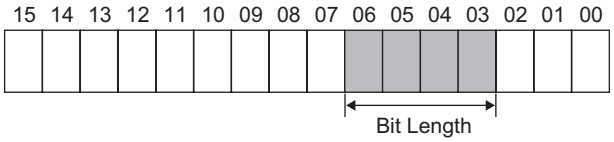
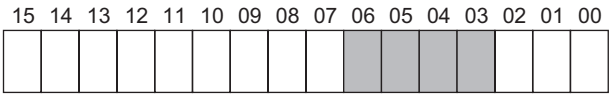
Setting		Description
Clear Color		Set the background color for a picture registered in [Package]. 
	Display Color	Set the background color for the picture to be called.
	Pattern	Set the background pattern for the picture to be called.
	Pattern Color	Set the background pattern color for the picture to 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 Settings' [Color Settings]. ☞ "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)

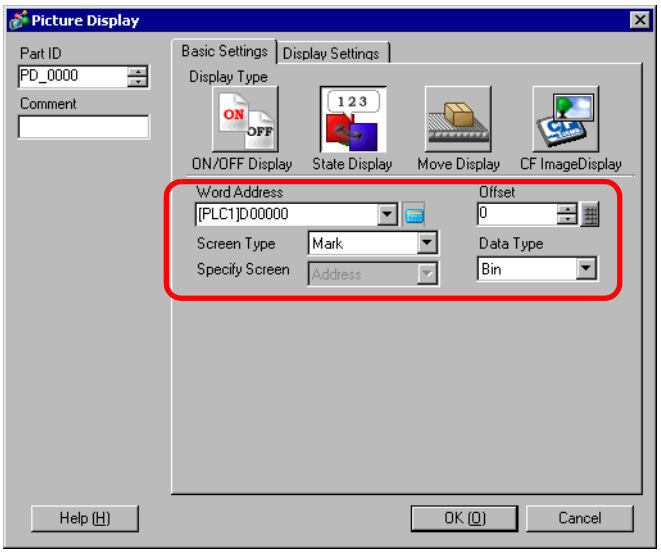


Setting		Description
Word Address		• When neither [Bit Detail Settings] nor [Range Settings] is set: Set the word address to change display. The screen with the screen number stored in this word address will be displayed. • When either [Bit Detail Settings] or [Range Settings] is set: Changes screens 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.
Screen 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

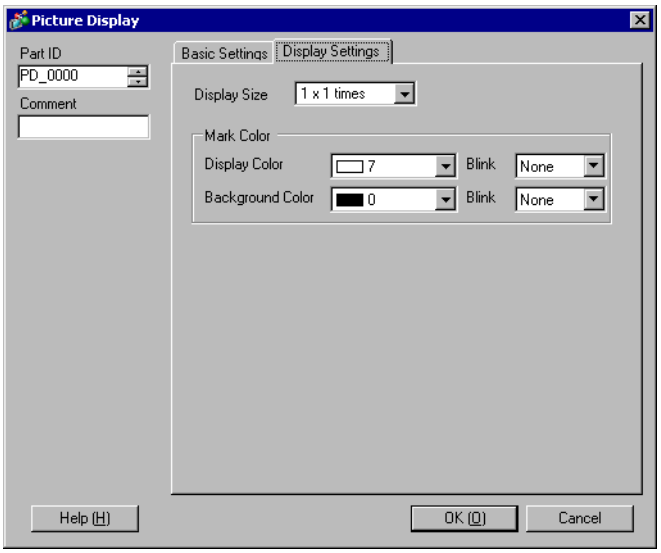
Setting		Description
Bit Detail Settings	Bit Length	Set the number of bits in the word address to assign for display. Set the [Bit Length] from 1 to 16. Set the bit length within the range of [Bit Offset] + [Bit Length] ≤ 16 if the bit offset is not 0. The number of screens to change is determined by 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] 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. e.g.) When the bit offset is "3" and the bit length is "4", the following 4 bits are used as data for change display. 
	No. of 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. e.g.) 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]'s data type from [Dec], [Hex], or [BCD].
	Range No.	Select the [Range No.] to be set.
	Min Value	Set the minimum value of the selected range.
	Max Value	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.
Screen 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 8,999. A Mark Screen with the offset value added to the screen number stored in the word address will be displayed.
Data Type	Select the word address' data type from [Bin] or [BCD].

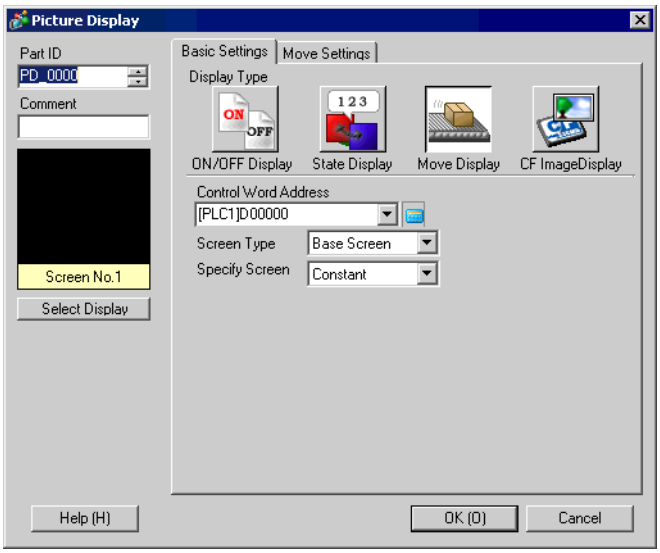
◆ Display Settings (for Mark)

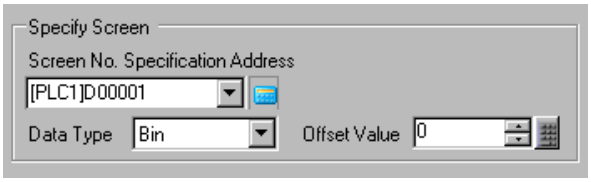


Setting		Description
Display Size		Set the display size of a picture registered in the Mark Screen. Set within the range of minimum size (1 × 1) and maximum size (8 × 8).
Mark Color		Set the color of a picture registered in the Mark Screen.
	Display Color	Select a color for the mark to display.
	Background 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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

■ Move Display

◆ Basic Settings

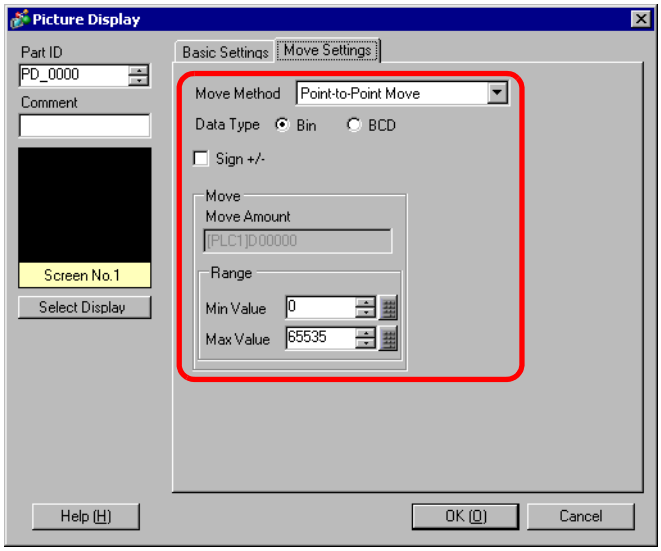


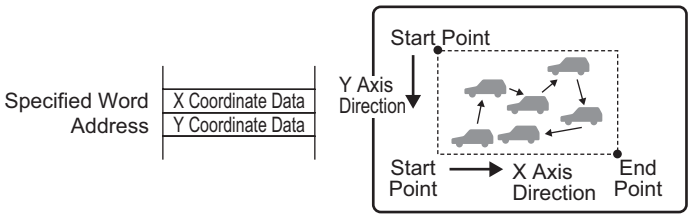
Setting		Description
Control Word Address		Designate the word address which stores the move amount. Moves and displays a screen picture in response to the stored data.
Screen Type		Select the screen type to display. **NOTE** • With move display, a screen to be called is displayed with the center overlapping 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 picture on the displaying screen is changeable. You can change the picture on the screen by storing the Screen Numbers in [Screen No. Specification Address]. 

Continued

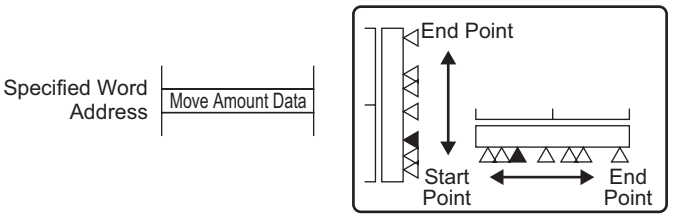
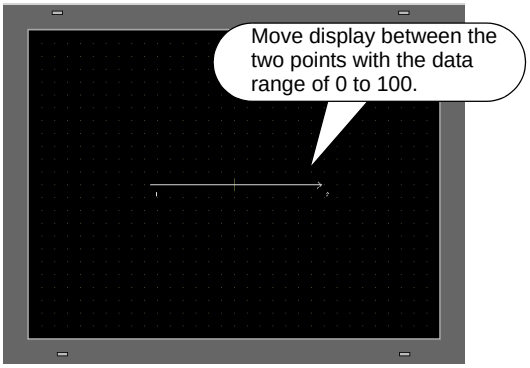
Setting			Description
Specify Screen	Address	Screen No. Specification Address	Set the address where the screen number to display is stored.
		Data Type	Select the display screen address' data type from [Bin] or [BCD].
		Offset Value	Set the offset value. A screen picture with the offset value added to the screen number stored in the display screen number address will be displayed.

◆ Move Settings (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. 

Continued

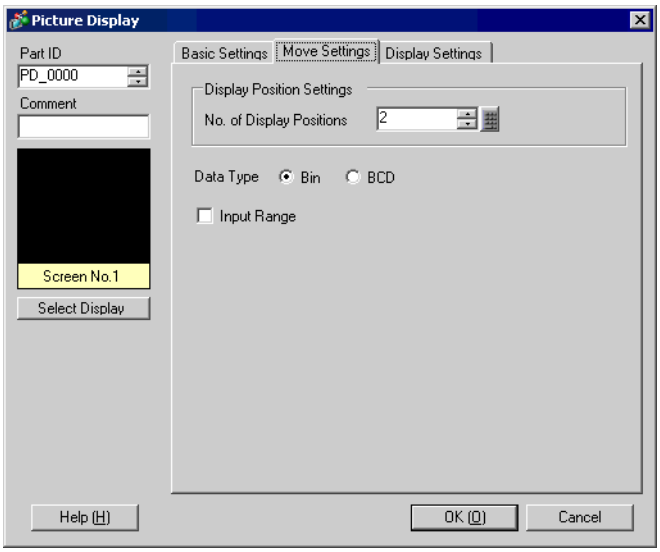
<table>
<tr><th colspan="3">Setting</th><th>Description</th></tr>
<tr><td rowspan="2">Move Method</td><td colspan="2">Point-to-Point Move</td><td>Moves and displays a screen on the line between the two specified points.
• Point-to-Point Move
A screen to be called moves linearly between two points. One word is used for data.
 
</td></tr>
<tr><td colspan="3">Data Type</td><td>Select the data type of the word address to store the move amount from [Bin] or [BCD].</td></tr>
<tr><td colspan="3">Sign +/–</td><td>Put a check mark 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.
e.g.) 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 Value</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>None</td><td>0 to 65534</td></tr>
<tr><td>Bin</td><td>Checked</td><td>-32768 to 32766</td></tr>
<tr><td>BCD</td><td>—</td><td>0 to 9998</td></tr>
</table></td></tr>
</table>

Continued

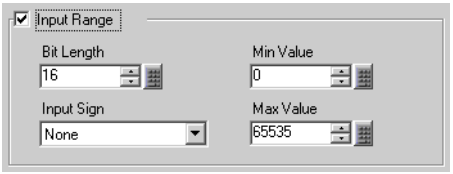
<table>
<tr><th colspan="3">Setting</th><th>Description</th></tr>
<tr><td>Move</td><td>Range</td><td>Max Value</td><td>Set the range maximum value. The setting range depends on the [Data Type] and [Sign +/–] settings.
<table>
<tr><th>Data Type</th><th>Input Sign</th><th>Input Range</th></tr>
<tr><td>Bin</td><td>None</td><td>1 to 65535</td></tr>
<tr><td>Bin</td><td>Checked</td><td>-32767 to 32767</td></tr>
<tr><td>BCD</td><td>—</td><td>1 to 9999</td></tr>
</table></td></tr>
</table>

◆ Move Settings (for Mark)



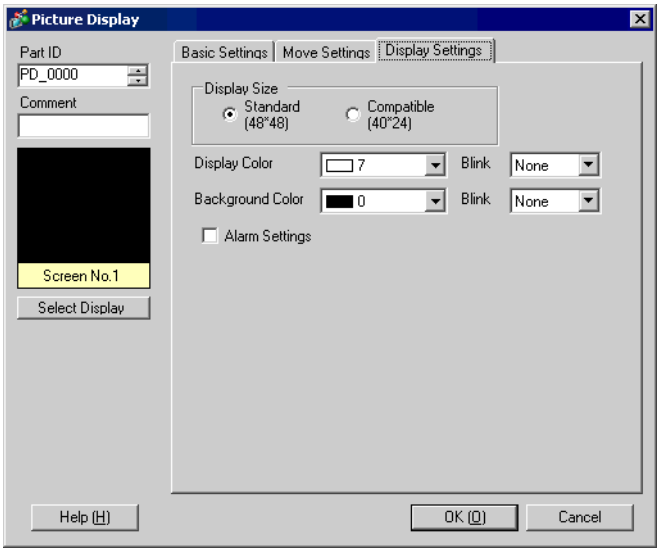
Setting		Description
Display Position Settings		Set a display position for placement.
	No. of Display Positions	Set the number of display positions for placement.
Data Type		Select the data type of the control word address to store the display position from “Bin” or “BCD”.

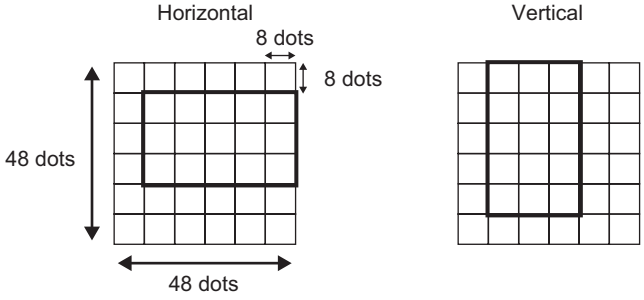
Continued

<table>
<tr><th colspan="2">Setting</th><th>Description</th></tr>
<tr><td colspan="2">Input Range</td><td>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.
 

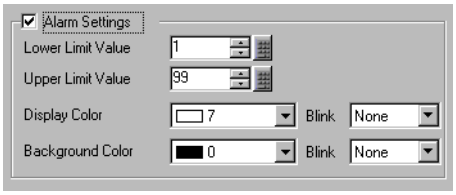
Input Range Min Value/Max Value List
<table>
<tr><th>Input Sign</th><th>Min Value</th><th>Max Value</th></tr>
<tr><td>None</td><td>0 to 65534</td><td>1 to 65535</td></tr>
<tr><td>2's Complement</td><td>-32768 to 32766</td><td>-32767 to 32767</td></tr>
<tr><td>MSB Sign</td><td>-32767 to 32766</td><td>-32766 to 32767</td></tr>
</table>
NOTE
• If the input range is not set, a screen is displayed at the data position stored in the control word address.</td></tr>
<tr><td></td><td>Bit Length</td><td>Set the valid bit length of the data to store in the word address.</td></tr>
<tr><td></td><td>Input Sign</td><td>Select the input sign from [None], [2's Complement], or [MSB Sign].</td></tr>
<tr><td></td><td>Min Value</td><td>Set the input range minimum value.</td></tr>
<tr><td></td><td>Max Value</td><td>Set the input range maximum value.</td></tr>
</table>

◆ Display Settings (for Mark)



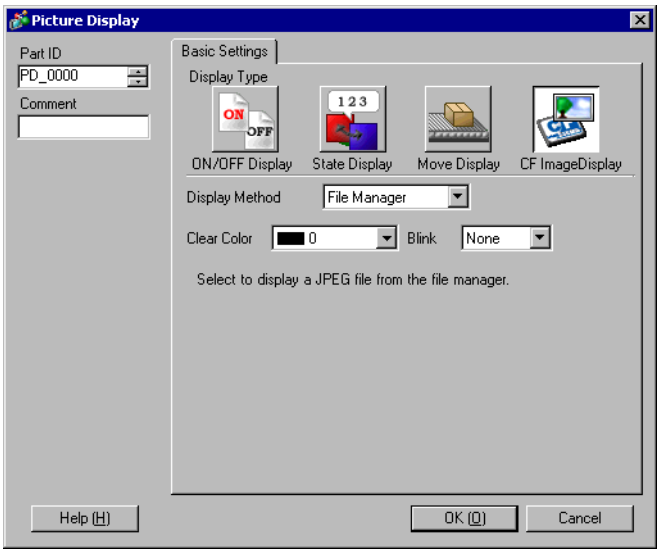
Setting	Description
Display Size	Select the size of a mark screen to display from [Standard (48 × 48)] or [Compatible (40 × 24)]. **NOTE** • Standard Select this when you use a mark created over the bold line borders in the following figures. • Compatible Select this when you use a mark created within 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.
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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

Continued

Setting		Description
Alarm Settings		Set whether or not to use the Alarm Settings. 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's display color/background color. 
	Lower Limit Value	Set the alarm's lower limit value from 1 to 98.
	Upper Limit Value	Upper Limit Value Set the alarm's 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 Settings' [Color Settings]. ☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

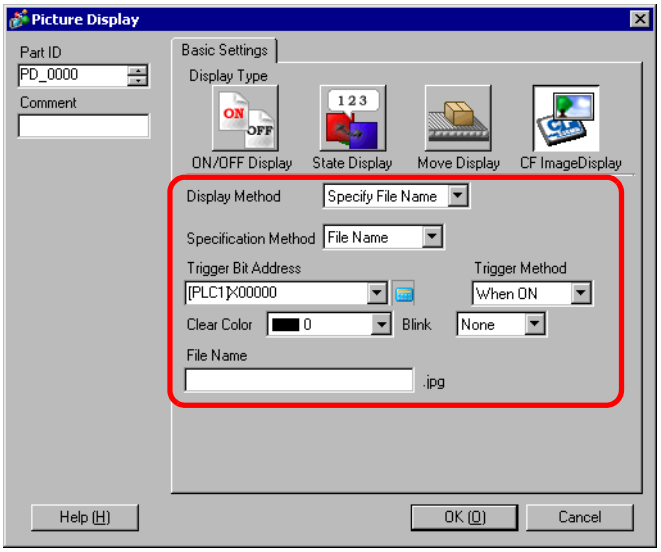
■ CF Image Display

◆ Basic Settings (File Manager)



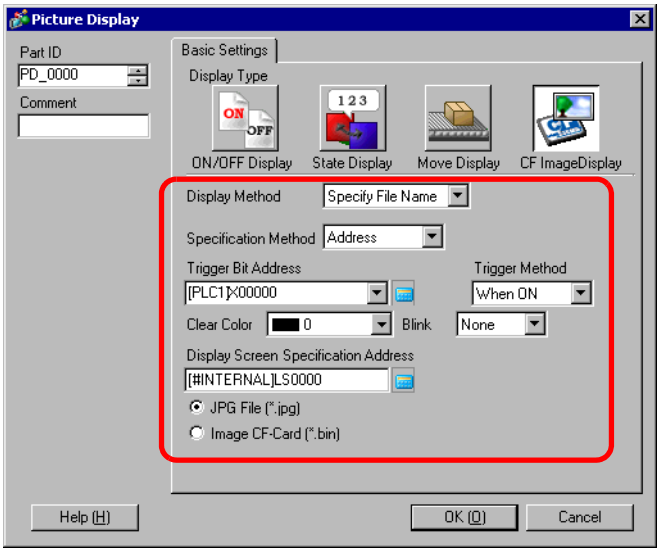
Setting		Description
Display Method		Set the method of displaying a file saved in a CF-card.
	File Manager	Displays a JPEG file image using the special data display's [File Manager]. **NOTE** • For more details on the special data display's [File Manager]: ☞ "25.10.2 Setup Guide for the Special Data Display ■ File Manager" (page 25-85)
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 Settings' [Color Settings]. ☞ "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.
Trigger Bit Address	Set the bit address which controls the image display.
Trigger 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 Settings' [Color Settings]. ☞ "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.
Trigger Bit Address	Set the bit address which controls the image display.
Trigger 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 Settings' [Color Settings]. ☞ "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].

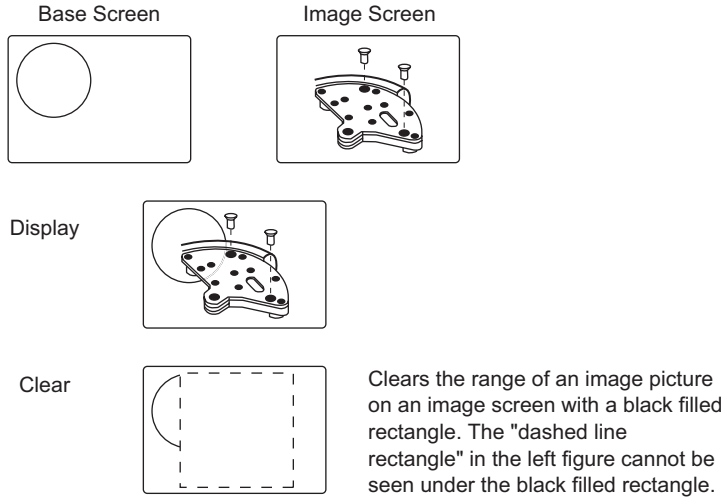
e.g.) Displaying an image file (LOGO.bin) in the [DATA] folder in a CF-card (Display Screen Specification Address: LS1000)
Setting Example
16 bit
LS1000 ‘D’ ‘A’
LS1001 ‘T’ ‘A’
LS1002 ‘\’ ‘L’
LS1003 ‘O’ ‘G’
LS1004 ‘O’ 00h
LS1005 00h 00h
: : :</td></tr>
<tr><td>JPG File (∗.jpg)</td><td>Select this when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

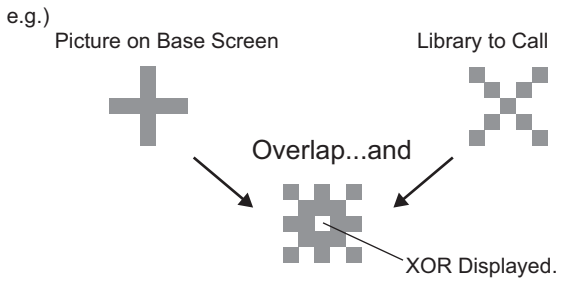
10.6.1 Restrictions for Picture Display (ON/OFF Display)

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

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



- When you call figures or texts 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

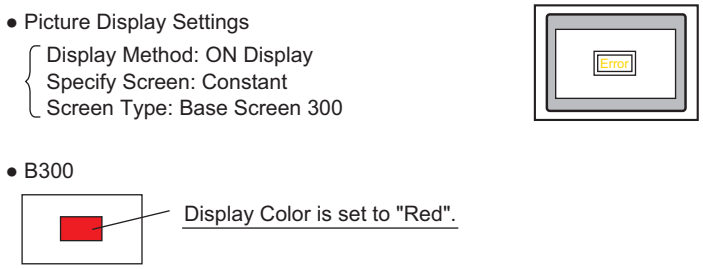
Color Combination Table

	Blue	Green	Light Blue	Red	Purple	Yellow	White
Blue	Black	Light Blue	Green	Purple	Red	White	Yellow
Green	Light Blue	Black	Blue	Yellow	White	Red	Purple
Light Blue	Green	Blue	Black	White	Yellow	Purple	Red
Red	Purple	Yellow	White	Black	Blue	Green	Light Blue
Purple	Red	White	Yellow	Blue	Black	Light Blue	Green
Yellow	White	Red	Purple	Green	Light Blue	Black	Blue
White	Yellow	Purple	Red	Light Blue	Green	Blue	Black

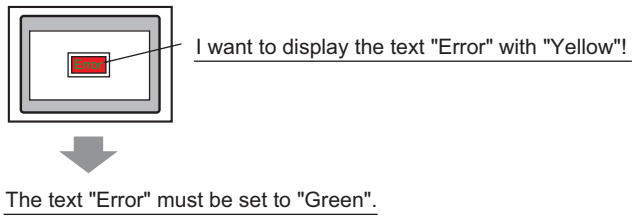
* When the same color overlaps, it becomes “Black”.

(e.g.)

Picture display on a base screen with the following settings



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

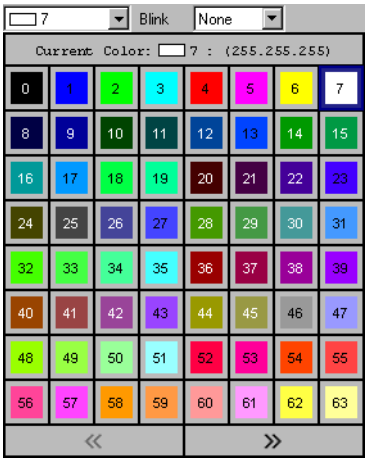


■ For 256 Colors Display

You can confirm a changing color by finding the RGB code from the overlapping color's color code and operating the RGB code by XOR (Exclusive OR).

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

(e.g.)

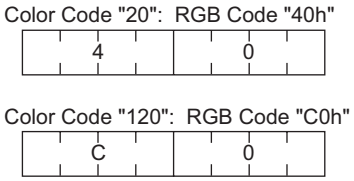
Overlapping the color codes “20” and “120”

Look up each color code’s RGB code in the “256 Colors RGB Code Table” on the previous page.

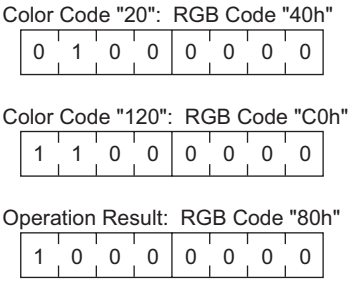
Color Code “20”: RGB Code “40h”

Color Code “120”: RGB Code “C0h”

Their data on the GP are as follows.



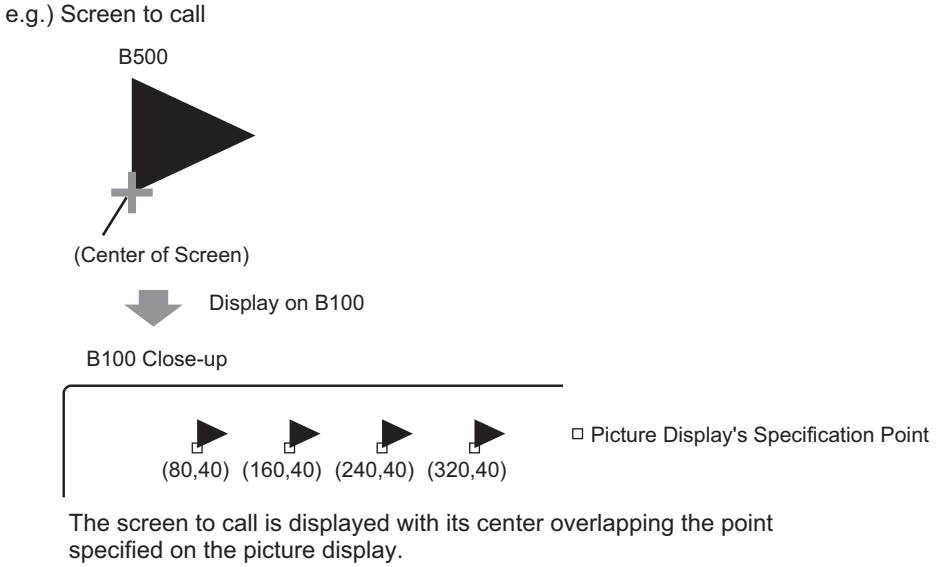
Operate by XOR for XOR display.



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”

- If you selected [Base Screen], [Image], or [Image CF-Card] in [Screen 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.

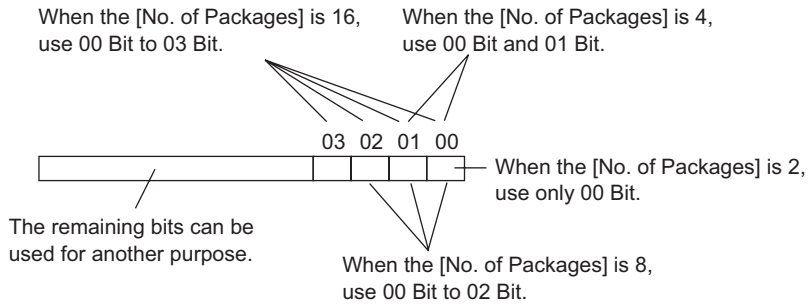


- With [Clearing Action] selected, pictures using two or more of the same dots in the drawing process (3-dot or 5-dot lines, lines with 2-dot arrow, or raised characters, etc.) cannot be normally displayed on a screen to display.
- If the overlapping target is image font, it will not have the XOR display.
- Only when the [Screen 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 [Screen 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 [No. 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 [No. 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 [Screen Type] is [Base Screen], [Image], or [Image CF-Card]

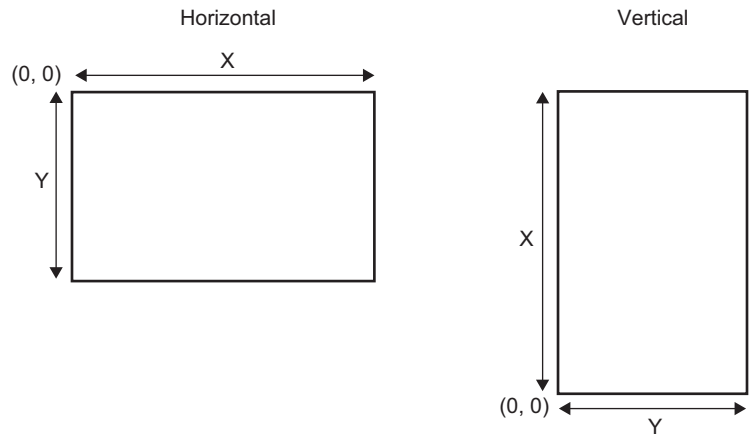
- The picture display places the display position specification point on the screen. The specification point is placed with reference to the center of a screen you want to call. The screen to call is displayed with its center overlapping the point specified on the picture display.

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.

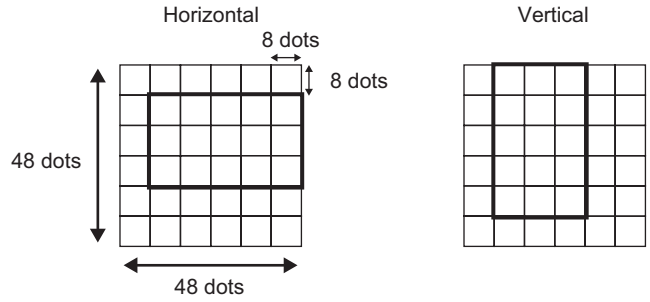
When the [Screen Type] is [Base Screen], [Image], or [Image CF-Card]

- 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 the Vertical is selected for the GP Type, the [Area Migration]'s coordinate system is as follows.

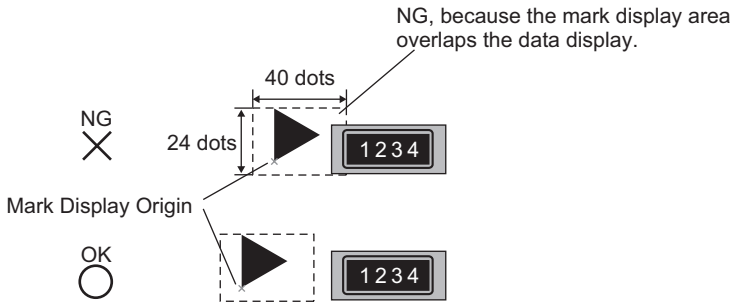


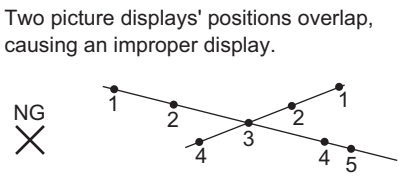
When the [Screen Type] is [Mark]

- When the [Specify Screen] is [Address] and multiple marks are used, select the [Display Size] - [Standard 48 × 48] on the picture display's [Display Settings] tab if there is any mark created over the bold line borders in the following figures.



- If a mark screen displayed on the picture display overlaps another part's display area, it may not be properly displayed. Overlapping display positions set on multiple picture displays also cause 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]'s [Screen 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 × 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 Trigger Bit Address turns ON (or OFF) will remain displayed even when the Trigger Bit Address turns OFF (or ON).
- For JPEG files in the CF-card, even if the GP's [Installation Method] is changed and the Picture Display's display area 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].