

# 17 | Graph Display

This chapter explains about “Graph” in GP-Pro EX, and the basic ways of creating and managing them. Please start by reading “17.1 Settings Menu” (page 17-2) and then turn to the corresponding page.

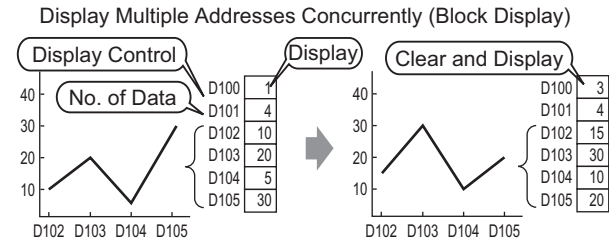
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17.2	Displaying the Current Value with a Bar/Circle/Tank Graph .....	17-4
17.3	Displaying Alarms with a Bar/Circle/Tank Graph.....	17-7
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## 17.1 Settings Menu

Displaying the Current Value with a Bar/Circle/Tank Graph	
<p>Designated data stored in a device/PLC can be displayed as a Graph.</p> <p>Range: 0 - 500</p>	<ul style="list-style-type: none"> <li>☞ Setup Procedure (page 17-5)</li> <li>☞ Details (page 17-4)</li> </ul>
Displaying Alarms with a Bar/Circle/Tank Graph	
<p>The displayed color will change when the value goes outside of a set range.</p> <p>Range: 0 - 500</p>	<ul style="list-style-type: none"> <li>☞ Setup Procedure (page 17-8)</li> <li>☞ Details (page 17-7)</li> </ul>
Displaying with Line Charts	
<p>Displays changes in data on a Line Chart.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>D100</p> <p>1st Sample 30</p> <p>2nd Sample 20</p> <p>3rd Sample 70</p> <p>4th Sample 80</p> </div> <p>Current Value = 30    Current Value = 20    Current Value = 70    Current Value = 80</p>	<ul style="list-style-type: none"> <li>☞ Setup Procedure (page 17-12)</li> <li>☞ Details (page 17-11)</li> </ul>
Using a Line Chart to scroll through past data	
<p>You can display a Line Chart's past data.</p> <p>Disp Back Fwd</p> <p>Beep</p>	<ul style="list-style-type: none"> <li>☞ Setup Procedure (page 17-16)</li> <li>☞ Details (page 17-15)</li> </ul>

**Displaying Multiple Addresses Concurrently (Block Display)**

Display the values of multiple consecutive Word Addresses on a single Line Chart.

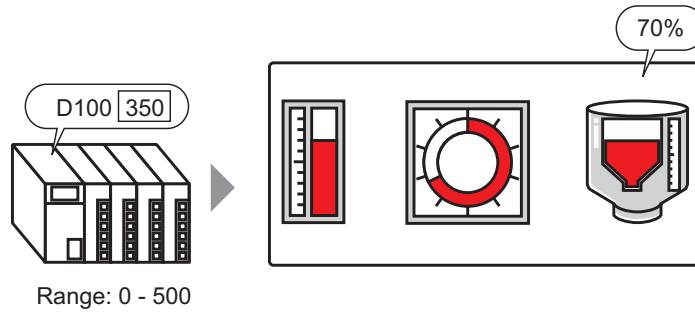


- ☞ Setup Procedure (page 17-20)
- ☞ Details (page 17-19)

## 17.2 Displaying the Current Value with a Bar/Circle/Tank Graph

### 17.2.1 Details

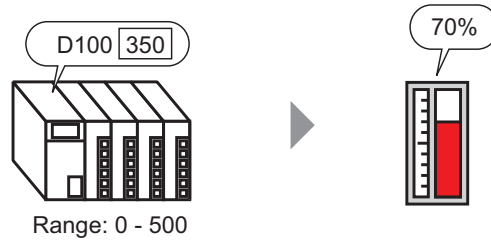
The current value is automatically converted to a value corresponding to the set range and displayed on the Graph.




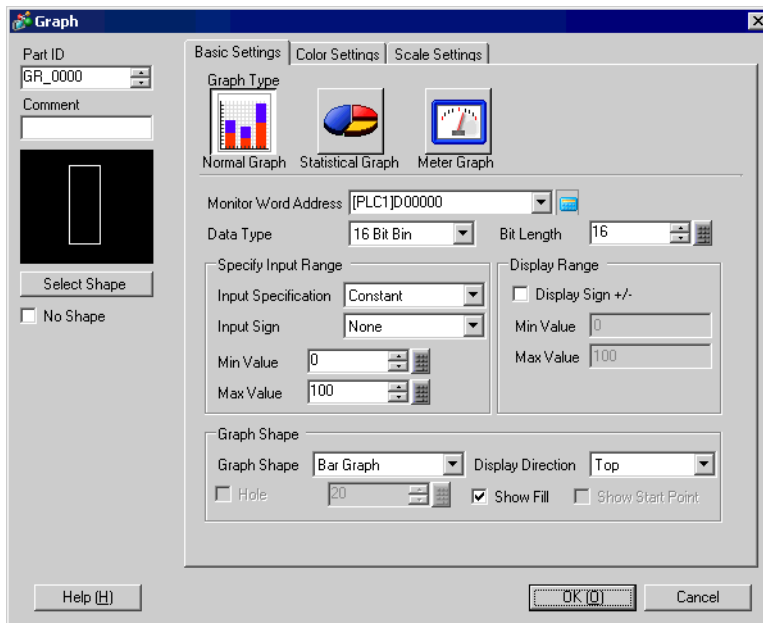
## 17.2.2 Setup Procedure

- NOTE**
- Please refer to the settings guide for details.
    - ☞ “17.2.1 Graph Part Settings Guide” (page 17-24)
  - For details about placing parts or setting addresses, shapes, or colors, please refer to the “Part Editing Procedure”.
    - ☞ “9.6.1 Editing Parts” (page 9-37)

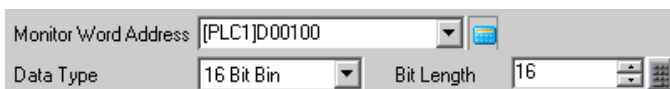
Displays word address (D100) data on a Bar Graph.



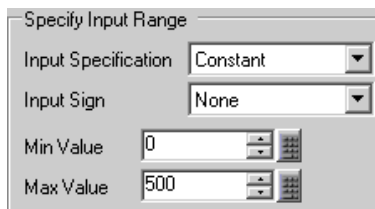
- 1 Select the [Part (P)] menu - [Graph (G)] command or click  and place the Part on the screen.
- 2 Double-click the placed Graph and the settings dialog box opens.



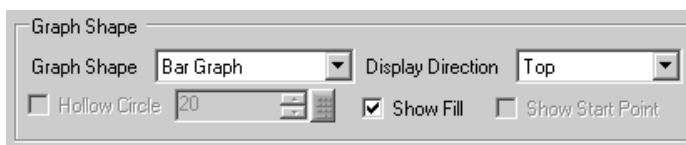
- 3 Set the address (D100) you want to display in [Monitor Word Address], and designate data type and bit length that will be stored there.



- 4 Select [Constant] as the [Input Specification], and designate the range of data that will be stored in that address (e.g.: min value 0, max value 500). If storing negative numbers, please set the [Input Sign] to [2's Complement] or [MSB Sign].



- 5 Select [Bar Graph] as the [Graph Shape].

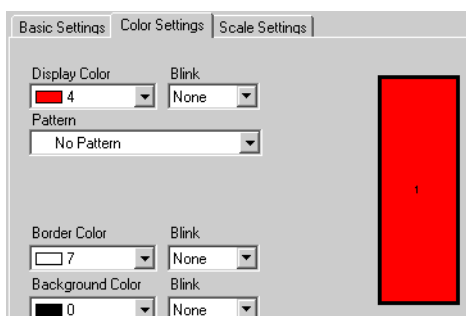



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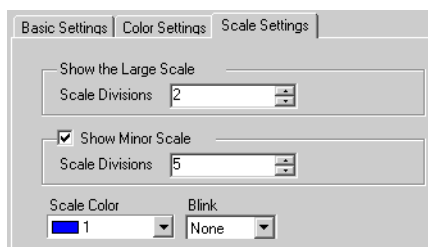
**NOTE** • You can also select [Circle Graph], [Semicircle Graph], and [Tank Graph].

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- 6 In [Select Shape], select the Graph's shape.
- 7 Set the Graph's display color in the [Color Settings] tab's [Display Color]. Set the Graph's other colors (pattern color, border color, etc.) if necessary.



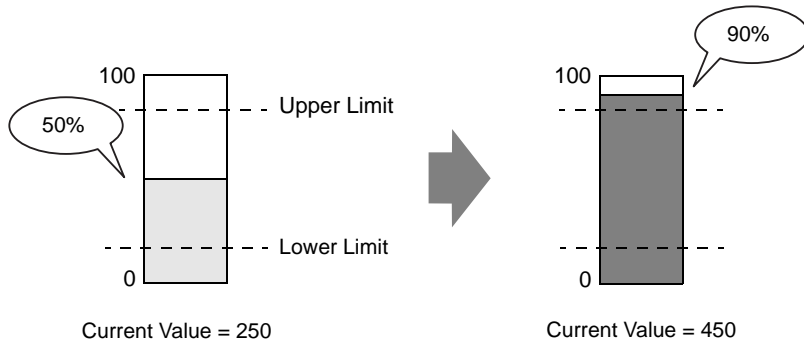
- 8 On the [Scale Settings] tab, set the scale's display settings, designate the scale's colors, and click [OK].



## 17.3 Displaying Alarms with a Bar/Circle/Tank Graph

### 17.3.1 Details

e.g.: When the data range is 0-500



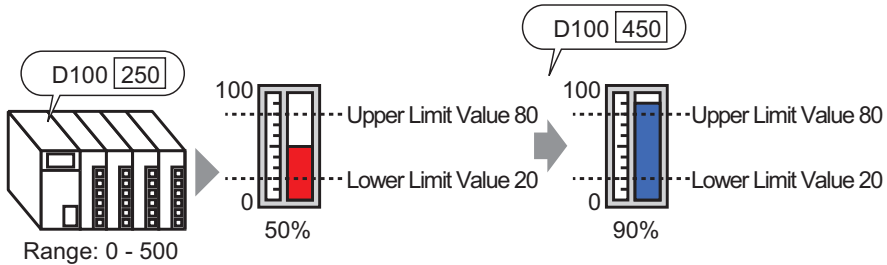
Designate the range and then when the value is outside of that range, the Graph's color will change.


This is useful for judging normal and abnormal values by sight.

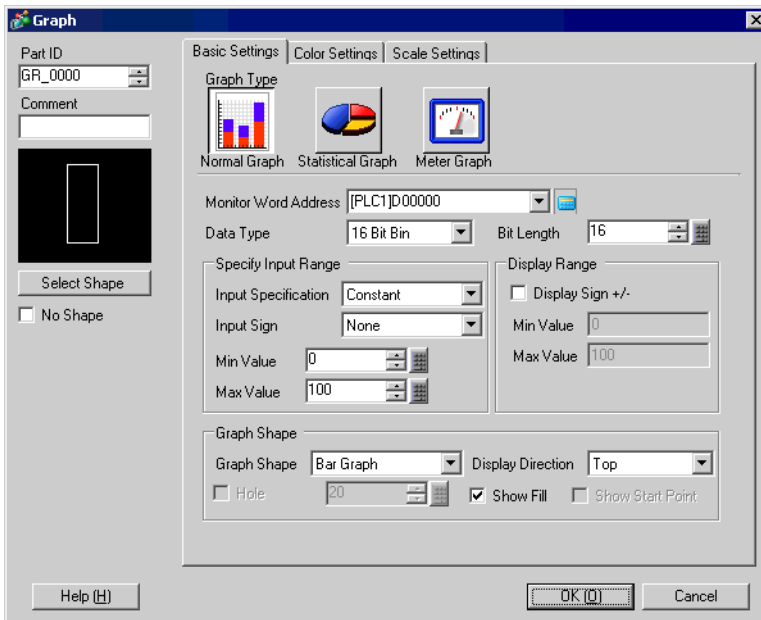
### 17.3.2 Setup Procedure

- NOTE**
- Please refer to the settings guide for details.
    - ☞ “17.7.1 Graph Part Settings Guide” (page 17-24)
  - For details about placing parts or setting addresses, shapes, or colors, please refer to the “Part Editing Procedure”.
    - ☞ “9.6.1 Editing Parts” (page 9-37)

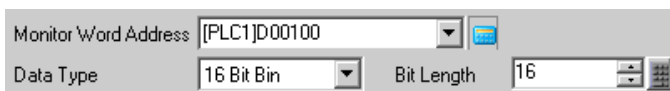
Set the Graph’s color so that it changes when the word address’ (D100) data goes below 20% or above 80% of the Input Range.



- 1 Select the [Part (P)] menu - [Graph (G)] command or click  and place the Part on the screen.
- 2 Double-click the placed Graph and the settings dialog box opens.

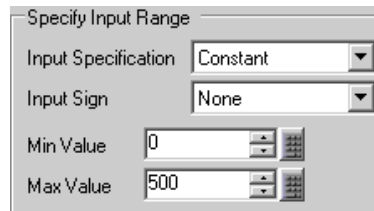


- 3 Set the address (D100) you want to display in [Monitor Word Address], and designate data type and bit length that will be stored there.





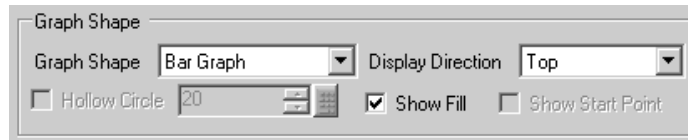
- 4 Select [Constant] as the [Input Specification], and designate the range (e.g.: Min Value 0, Max Value 500) of data that will be inputted in that address



The 'Specify Input Range' dialog box contains the following settings:

- Input Specification: Constant
- Input Sign: None
- Min Value: 0
- Max Value: 500

- 5 Select [Bar Graph] as the [Graph Shape].



The 'Graph Shape' dialog box contains the following settings:

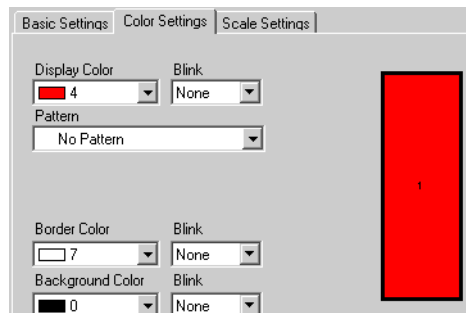
- Graph Shape: Bar Graph
- Display Direction: Top
- Hollow Circle: 20
- Show Fill:
- Show Start Point:

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**NOTE** • You can also select [Circle Graph], [Semicircle Graph], and [Tank Graph].

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- 6 In [Select Shape], select the Graph's shape.
- 7 Set the Graph's display color in the [Color Settings] tab's [Display Color]. Set the Graph's other colors (pattern color, border color, etc.) if necessary.



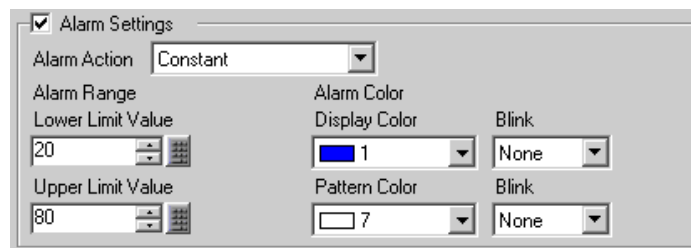
The 'Color Settings' dialog box shows the following configurations:

- Display Color: 4 (Red)
- Blink: None
- Pattern: No Pattern
- Border Color: 7 (White)
- Border Blink: None
- Background Color: 0 (Black)
- Background Blink: None

A preview window on the right displays a red vertical bar with a white border and a black background.

- 8 Select the [Alarm Settings] check box, and specify the alarm range (percentage). (e.g.: Lower Limit Value 20, Upper Limit Value 80).

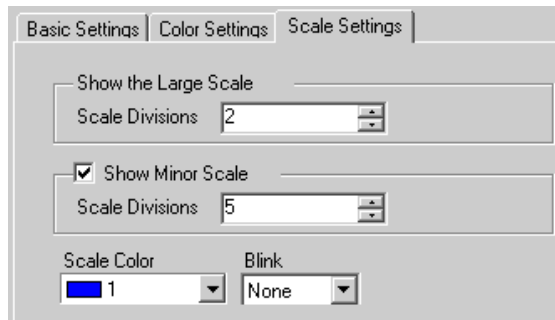
In [Display Color], set the Alarm Display color.



The 'Alarm Settings' dialog box is configured as follows:

- Alarm Settings:
- Alarm Action: Constant
- Alarm Range:
  - Lower Limit Value: 20
  - Upper Limit Value: 80
- Alarm Color: 1 (Blue)
- Alarm Display Color: 1 (Blue)
- Alarm Blink: None
- Pattern Color: 7 (White)
- Pattern Blink: None

- 9 As needed, set whether the scales will appear or not and the Scale's color on the [Scale Settings] tab, and click [OK].



## 17.4 Displaying with Line Charts

### 17.4.1 Details



By taking data regular or random intervals, it can be displayed on a Line Chart. This is useful for identifying large changes in data, and for monitoring the correlation between many data items.

Up to 20 separate data lines can be displayed on a single Line Chart.

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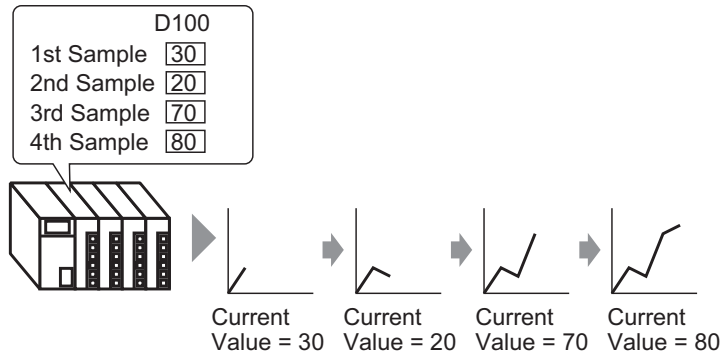
**IMPORTANT**


- Use the Sampling function to get data. To display an Historical Trend Graph, you first need to set connection device/PLC data to be collected in the GP, using the Sampling Settings.
    - ☞ “24.3 Sampling Data at Constant Intervals” (page 24-5)
    - ☞ “24.4 Sampling Data at Specific Periods” (page 24-10)
-

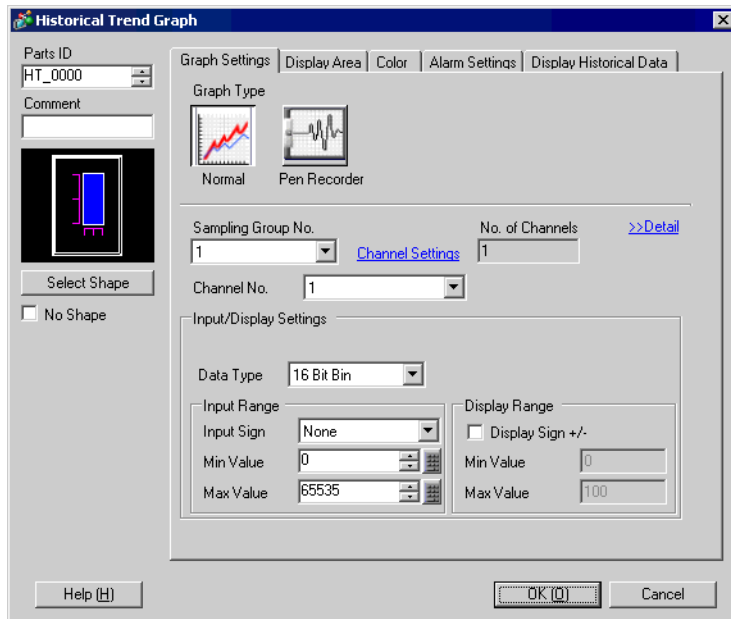
## 17.4.2 Setup Procedure

- NOTE**
- Please refer to the settings guide for details.
    - ☞ “17.7.2 Historical Trend Graph Settings Guide” (page 17-40)
  - For details about placing parts or setting addresses, shapes, or colors, please refer to the “Part Editing Procedure”.
    - ☞ “9.6.1 Editing Parts” (page 9-37)

Each time a Word Address’ (D100) data is acquired (sampled), that data gets displayed on the Line Chart.

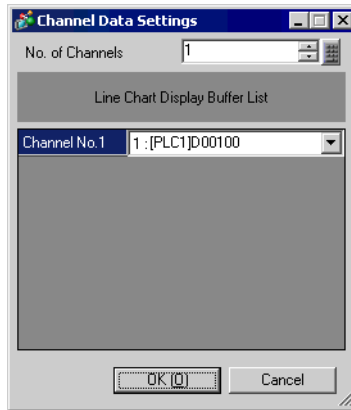


- 1 Select the [Part (P)] menu - [Historical Trend Graph (H)] command or click  and place the Part on the screen.
- 2 Double-click the placed Historical Trend Graph and the settings dialog box opens.

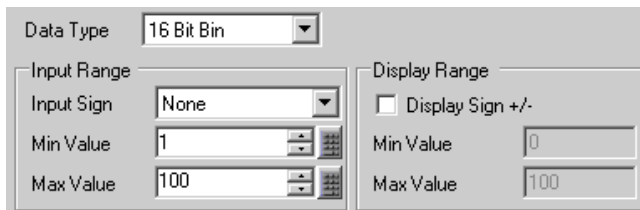


- 3 In [Select Shape], select the Graph’s shape.

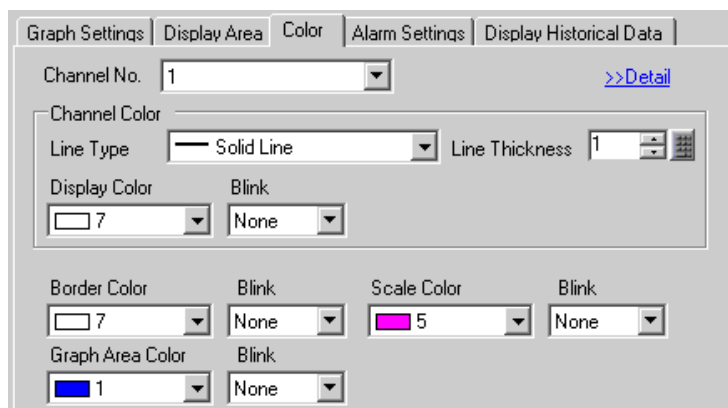
- 4 In [Sampling Group No.], select the number of the sampling group you want to display.
- 5 Click on [Channel Settings] and the following dialog box will open.  
Set the number of data lines (1 channel) to be displayed on the graph in [No. of Channels], and select the graph display address (e.g.: D100) in [Channel No.1].



- 6 Set the data type and range (Min Value/Max Value) for data on the graph.



- 7 On the [Color] tab, set the color and Line Type to be displayed, and Graph Area Color.



- 8 On the [Display Area] tab, set the graph's display direction and the number of Data Sample "4". Set the [No. of Samples to Scroll] to the same value as the number of Data Sample.

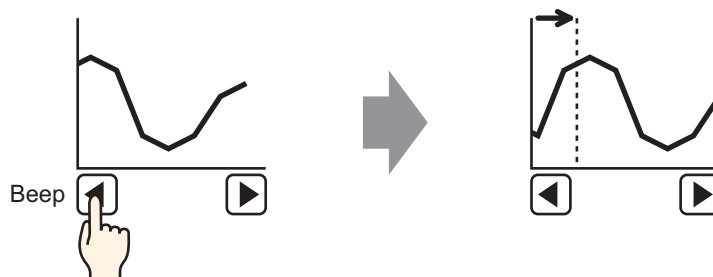
The screenshot shows a dialog box with the following settings:

- Tab: Display Area
- Display Direction: Bottom Left Corner -> Rightward
- Data Samples: 4
- No. of Samples to Scroll: 4
- Scale Divisions:
  - Vertical Major Scale: 2
  - Vertical Minor Scale:  5
  - Horizontal Major Scale: 2
  - Horizontal Minor Scale:  5

- 9 Adjust the scale settings as necessary, and click [OK].

## 17.5 Using a Line Chart to scroll through past data

### 17.5.1 Details



You can display a Line Chart's past data.

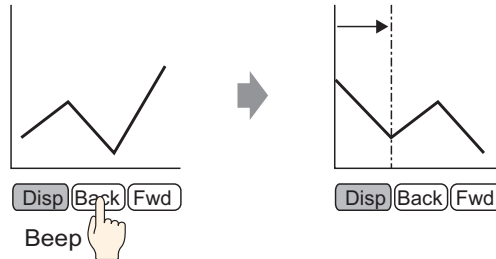
Past data that has already be cleared from the screen can be displayed again. This function is useful for referring to recent past data or looking for changes in data.


## 17.5.2 Setup Procedure

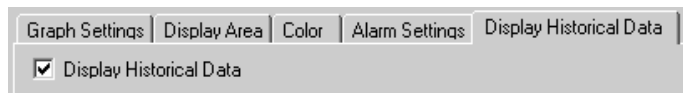
**NOTE**

- Please refer to the settings guide for details.
  - ☞ “17.7.2 Historical Trend Graph Settings Guide” (page 17-40)
- For details of the part placement method and the address, shape, color, and label setting method, refer to the “Part Editing Procedure”.
  - ☞ “9.6.1 Editing Parts” (page 9-37)

Use these settings when you want to check a Word Address’ (D100) past data.



- 1 Select the [Part (P)] menu - [Historical Trend Graph (H)] command or click  and place the Part on the screen.
- 2 Double-click the placed Historical Trend Graph and the settings dialog box opens. Set the sampling group and address (D100), then adjust the settings needed for display such as the line color, number of display data, etc.
  - ☞ “17.4.2 Setup Procedure” (page 17-12)
- 3 Open the [Display Historical Data] tab, and put a check mark next to the [Display Historical Data] box.



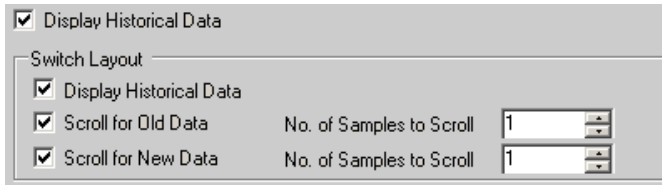
**NOTE**

- Only one Historical Trend Graph part with a Display Historical Data function can be placed per screen.



### 4 Set the switches which will display historical data.

Set the number that a scroll switch will scroll when pressed once.



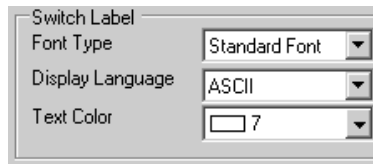
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**NOTE** • You can use a Switch Lamp's [Special Switch] - [Historical Trend Graph Switch] to individually set the shape and color of the switches without setting the Switch Layout on the Historical Trend Graph.

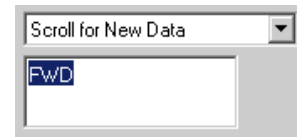
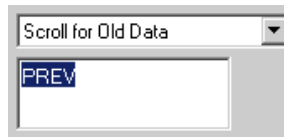
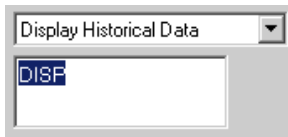
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### 5 Select the Switch's shape from [Select Shape].

### 6 Select the Switch Label's font type and display language, and set the text color.

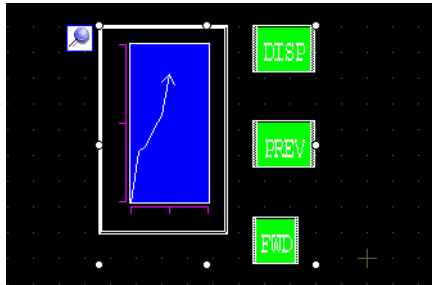


### 7 In [Select Switch], choose the switch whose label you will set, and input the text in [Label]. Input a label for each of the switches you will use.

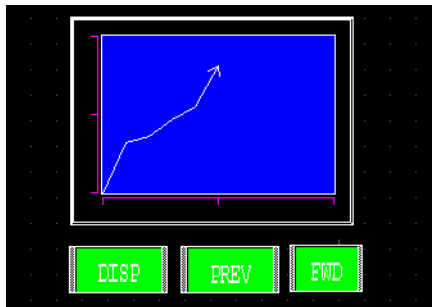


- 8 Select the switch's color and click [OK]. (Some colors cannot be set depending on the selected switch shape.)

The switches are placed on the top right of the Historical Trend Graph.

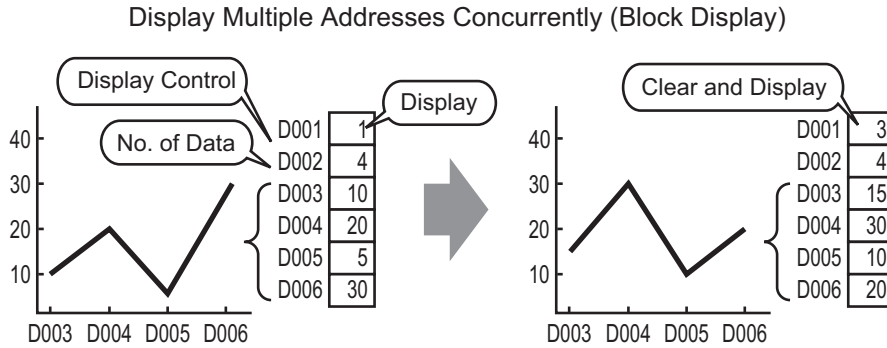


- 9 Select the Graph display part and an individual switch independently and move it anywhere within the screen.



## 17.6 Displaying Multiple Addresses Concurrently (Block Display)

### 17.6.1 Details



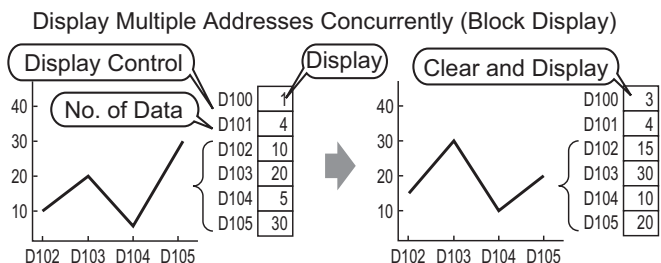
You can display multiple values from consecutive word addresses on a single Line Chart. You can compare the values and state of multiple data items.


## 17.6.2 Setup Procedure

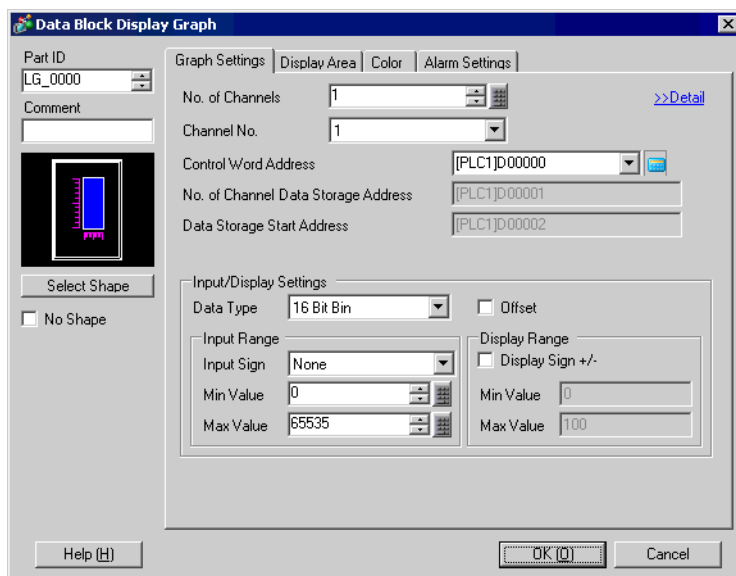
**NOTE**

- Please refer to the settings guide for details.
  - ☞ “17.7.3 Data Block Display Graph Settings Guide” (page 17-55)
- For details about placing parts or setting addresses, shapes, or colors, please refer to the “Part Editing Procedure”.
  - ☞ “9.6.1 Editing Parts” (page 9-37)

Turn on bit 0 of the word address (D100), and create a Line Chart of the data of 4 consecutive words in block display.



- 1 Select the [Part (P)] menu - [Data Block Display Graph (L)] command or click  and place the Part on the screen.
- 2 Double-click the placed Data Block Display Graph and the settings dialog box opens.



- 3 In [Select Shape], select the Graph's shape.

- 4 Set the address (D100) which will control the graph display in [Control Word Address].  
The address (D101) used to store the number of data displayed on the graph “4” is displayed in [No. of Channel Data Storage Address].

Control Word Address	[PLC1]D00100
No. of Channel Data Storage Address	[PLC1]D00101
Data Storage Start Address	[PLC1]D00102

- 5 Designate the Min Value/Max Value of data that will be stored in that address. If storing negative numbers, please set the [Input Sign] to [2’s Complement] or [MSB Sign].

Input/Display Settings

Data Type: 16 Bit Bin

Input Range

Input Sign: None

Min Value: 0

Max Value: 100

- 6 On the [Display Area] tab, set the graph’s display direction and the number of displayed data “4”.

Graph Settings | Display Area | Color | Alarm Settings

Display Direction: Bottom Left Corner -> Rightward

Data Samples: 4

Scale Divisions

Vertical Major Scale: 2 | Vertical Minor Scale:  5

Horizontal Major Scale: 2 | Horizontal Minor Scale:  5

- 7 On the [Color] tab, set the color and type of the line to be displayed, and the color of the Graph Display Area. Next click [OK].

Graph Settings | Display Area | Color | Alarm Settings

Channel No.: 1

Channel Color

Line: Solid Line | Line Thickness: 1

Display Color: 7 | Blink: None

Dot: Circle | Blink: None

Border Color: 7 | Blink: None

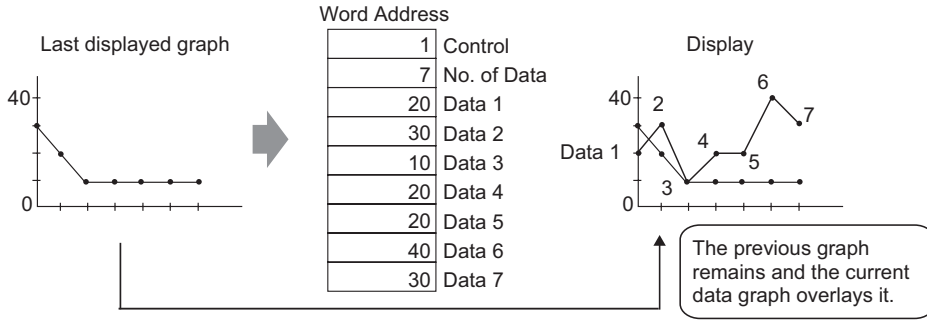
Scale Color: 5 | Blink: None

Graph Area Color: 1 | Blink: None

### 17.6.3 Displaying/Clearing a Data Block Display Graph

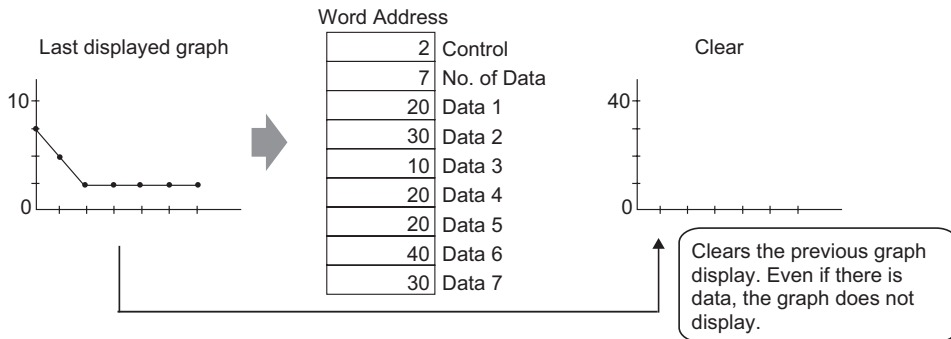
#### ◆ Display

Store the number of data that will display on the graph in [No. of Channel Data Storage Address] and set the data channels after [Data Storage Start Address]. Then write “1” to the [Control Word Address] (turn ON bit 0).



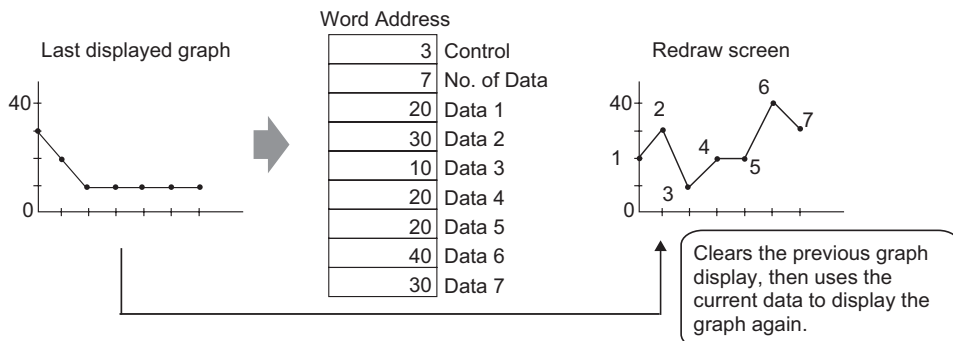
#### ◆ Clear

Write “2” to the [Control Word Address] (turn ON bit 1). The displayed graph will be cleared.



#### ◆ Clear and Display

Write “3” to the [Control Word Address] (turn ON bit 0 and bit 1). After the displayed graph is cleared, the graph is re-displayed with the currently stored data.

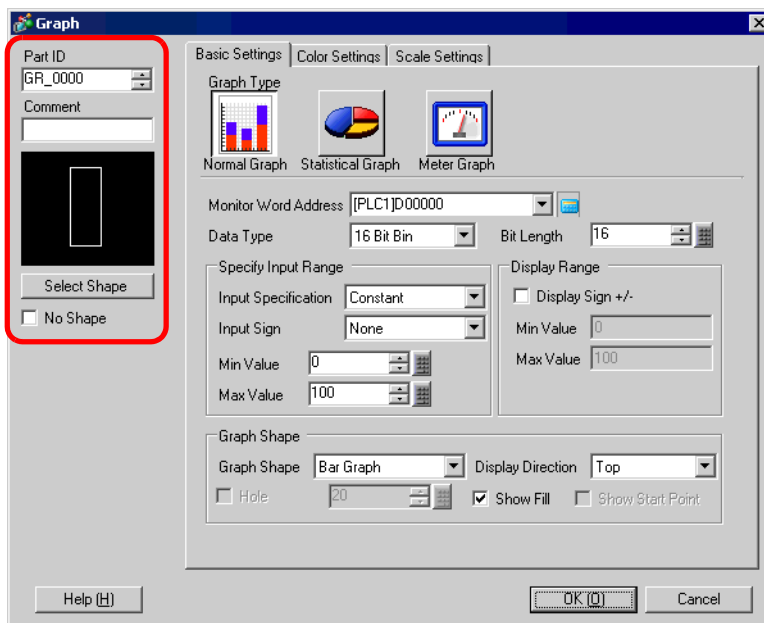


**IMPORTANT**

- To display the graph, delay the Control Address' display bit (bit 0) by a time longer than the communication cycle time or 50ms (whichever is larger), after storing the data count and data values.
  - After displaying the graph, the Control Address' data resets to 0. To display the graph again, store the data in the same Control Address. However, be sure to delay by a time longer than the communication cycle time or 50 ms (whichever is larger).
  - The communication cycle time is stored in GP internal device special relay (LS2037).
-

## 17.7 Settings Guide

### 17.7.1 Graph Part Settings Guide

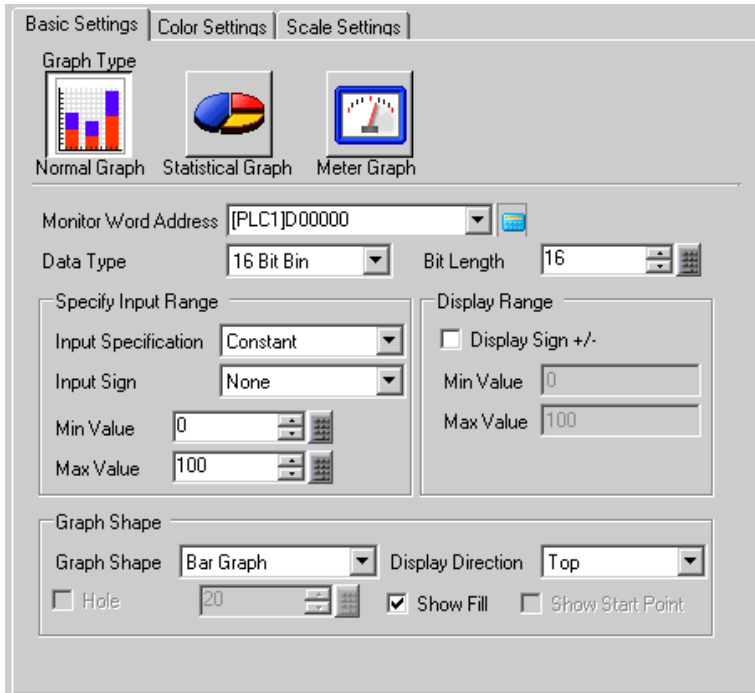


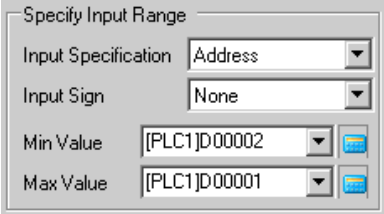
Setting	Description
Part ID	Placed parts are automatically assigned an ID number. Graph ID: GR_**** (4 digits) The letter portion is fixed. The number portion can be modified from 0000 to 9,999.
Comment	The comment for each Part can be up to 20 characters long.
Part Shape	Displays the shape that you chose for the part with [Select Shape].
Select Shape	Open the Select Shape dialog box to choose the Part's shape.
No Shape	Select whether or not the part will be transparent with no shape. This can only be set when the [Graph Type] is [Normal Graph] or [Statistical Graph].
Graph Type	Select the Graph's type. <ul style="list-style-type: none"> <li>• Normal Graph Displays a specified address' current value in the graph. ☞ "17.7.1 Graph Part Settings Guide ■ Normal Graph" (page 17-25)</li> <li>• Statistical Graph Statistics are taken from data stored in multiple consecutive addresses starting from a set address and displayed on the graph. ☞ "17.7.1 Graph Part Settings Guide ■ Statistical Graph" (page 17-34)</li> <li>• Meter Graph Displays a specified address' current value with a moving needle. ☞ "17.7.1 Graph Part Settings Guide ■ Meter Graph" (page 17-36)</li> </ul>



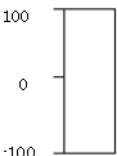
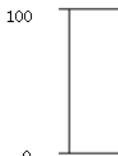
■ Normal Graph

◆ Basic Settings



Setting		Description
Monitor Word Address		The data stored in this Word Address will be displayed in the graph.
Data Type		Select the graph display's data type from [16 Bit Bin], [16 Bit BCD], [32 Bit Bin], [32 Bit BCD], or [32 Bit Float].
Bit Length		If [Data Type] is [16 Bit Bin], set the data's enabled bit length from 1 to 16.
Specify Input Range	Input Specification	<p>Choose how the input range's max and min values will be specified.</p> <ul style="list-style-type: none"> <li>• Constant Designate a set constant as the Min/Max Value.</li> <li>• Address Designate the address where the Min/Max Values are stored.</li> </ul> 

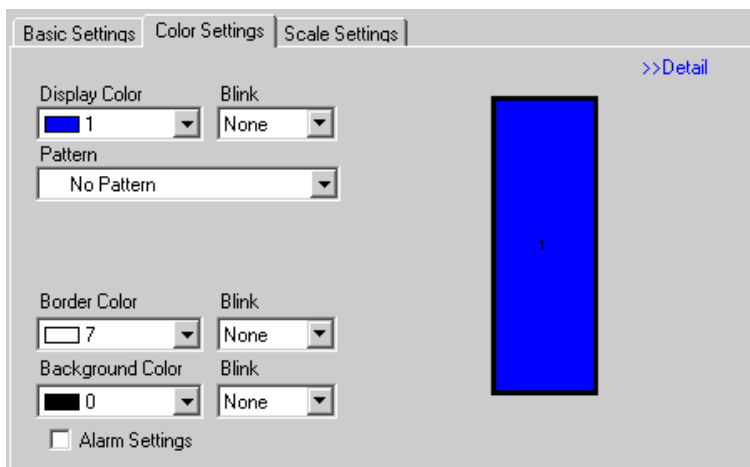
Continued

Setting		Description																									
Specify Input Range	Input Sign	<p>Set whether graph display data will be able to handle negative numeric data. This can only be set when the [Data Type] is [16 Bit Bin] or [32 Bit Bin].</p> <ul style="list-style-type: none"> <li>• None Only positive numeric data will be handled.</li> <li>• 2's Complement Negative numbers are handled with 2's complement.</li> <li>• MSB Sign Negative numbers are handled with MSB sign.</li> </ul>																									
	Min. Value/Max. Value	<p>Select the input range for graph display data. If [Input Specification] is [Constant], you can input a min value/max value. If [Address] is set, specify the Word Address where the min value/max value will be stored.</p> <p>Each [Data Type] and [Input Sign] has a different size range.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Data Type</th> <th>Input Sign</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td rowspan="3">16 Bit Bin</td> <td>None</td> <td>0 to 65535</td> </tr> <tr> <td>2's Complement</td> <td>-32,768 to 32,767</td> </tr> <tr> <td>MSB Sign</td> <td>-32767 to 32767</td> </tr> <tr> <td rowspan="3">32 Bit Bin</td> <td>None</td> <td>0 to 4294967295</td> </tr> <tr> <td>2's Complement</td> <td>-2147483648 to 2147483647</td> </tr> <tr> <td>MSB Sign</td> <td>-2147483647 to 2147483647</td> </tr> <tr> <td>16 Bit BCD</td> <td>–</td> <td>0 to 9999</td> </tr> <tr> <td>32 Bit BCD</td> <td>–</td> <td>0 to 99999999</td> </tr> <tr> <td>32 Bit Float</td> <td>–</td> <td>-9.9e<sup>16</sup> to 9.9e<sup>16</sup></td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Word address data will automatically convert to correspond to the input range, and will be displayed on the graph as a value between 1 and 1,000.</li> </ul>	Data Type	Input Sign	Range	16 Bit Bin	None	0 to 65535	2's Complement	-32,768 to 32,767	MSB Sign	-32767 to 32767	32 Bit Bin	None	0 to 4294967295	2's Complement	-2147483648 to 2147483647	MSB Sign	-2147483647 to 2147483647	16 Bit BCD	–	0 to 9999	32 Bit BCD	–	0 to 99999999	32 Bit Float	–
Data Type	Input Sign	Range																									
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	2's Complement	-2147483648 to 2147483647																									
	MSB Sign	-2147483647 to 2147483647																									
16 Bit BCD	–	0 to 9999																									
32 Bit BCD	–	0 to 99999999																									
32 Bit Float	–	-9.9e <sup>16</sup> to 9.9e <sup>16</sup>																									
Display Range	Display Sign +/-	<p>Specify whether or not negative numbers will be displayed. This can be set when the [Data Type] is [Bin] or [Float].</p> <p>e.g.: For a Bar Graph</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> Display Sign +/-                Negative numbers displayed         </div> <div style="text-align: center;"> <input type="checkbox"/> Display Sign +/-                Negative numbers not displayed         </div> </div>																									
	Min. Value/Max. Value	<p>Shows the display range's Min Value and Max Value. If [Display Sign +/-] is set, the Min Value is displayed as "-100". If it is not set, the Min Value is displayed as "0". The Max Value is fixed as "100".</p>																									

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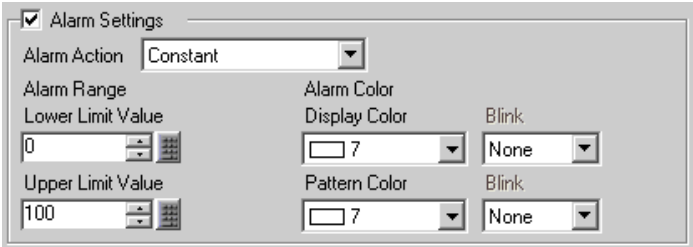
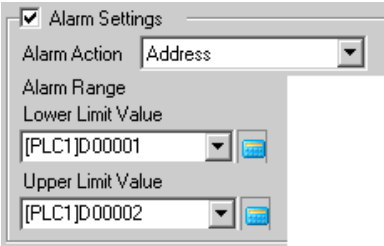
Setting		Description
Graph Shape	Graph Shape	Choose the graph shape from [Bar Graph], [Circle Graph], [Semicircle Graph], and [Tank Graph].
	Display Direction	Set a direction for the graph display. If the [Graph Shape] is [Bar Graph] or [Tank Graph], choose from [Top], [Bottom], [Left], or [Right]. For [Circle Graph] and [Semicircle Graph], the starting point is fixed at the top and will rotate clockwise.
	Hollow Circle	When the [Graph Shape] is [Circle Graph] or [Semicircle Graph], set the radius of the inner circle. <b>NOTE</b> • If you set the radius of the inner circle to less than 20 dots, the graph may not be properly displayed.
	Show Fill	Set whether or not to display a fill in the graph. If you do not want to display a fill, the graph will become a Meter Graph.
	Show Start Point	If the [Graph Shape] is [Circle Graph] or [Semicircle Graph] and [Show Fill] is not set, select whether or not to display the start point.

◆ Color Settings/Basic



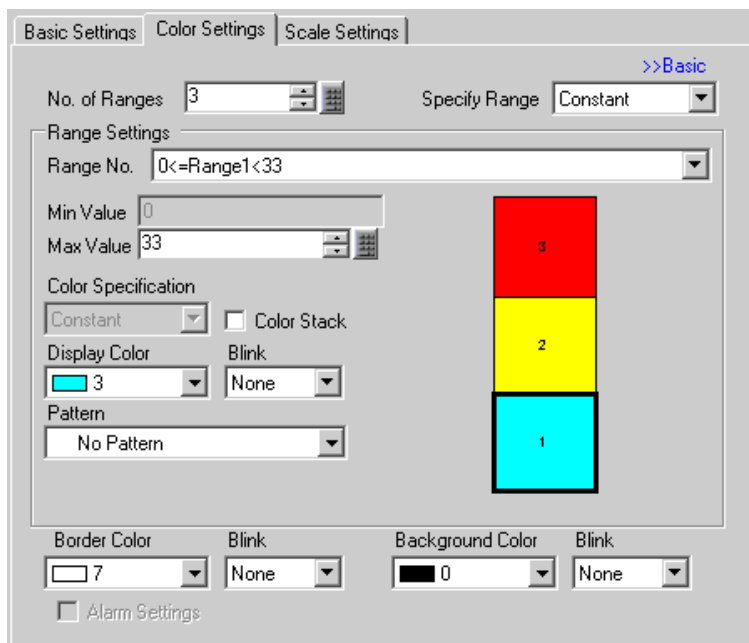
Setting	Description
Display Color	Select the display color for the graph. If [Show Fill] is not selected and a Meter Graph is used, the color set here will become the needle color.
Pattern	Select the graph's pattern from among 9 types.
Pattern Color	Select the pattern color.
Border Color	Select a color for the graph's border. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Background Color	Select the background color for the graph. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], [Pattern Color], [Border Color], and [Background Color]. <b>NOTE</b> <ul style="list-style-type: none"> <li>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)</li> </ul>
Graph Display Sample	Displays a sample of how the graph will appear with the set [Display Color].

Continued

Setting	Description
<p>Alarm Settings</p>	<p>Set whether or not the graph's color will change when the value goes outside of the set range.</p>  <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• This cannot be set when the detail settings' [No. of Ranges] is 2 or more.</li> <li>• This cannot be set when detail settings' [Color Specification] is set to [Address].</li> </ul>
<p>Alarm Action</p>	<p>Choose how the alarm range's upper and lower limit value will be specified.</p> <ul style="list-style-type: none"> <li>• Constant Designate a set constant as the Min/Max value.</li> <li>• Address Designate the address where the Upper/Lower Limit values are stored.</li> </ul> 
<p>Upper Limit/ Lower Limit</p>	<p>Set the upper and lower limits for the Alarm Range from 0 to 100 (with [Display Sign +/-] selected, from -100 to 100). If [Alarm Action] is [Constant], input an upper/lower limit value. If [Address] is set, specify the Word Address where the upper/lower limit value will be stored.</p>
<p>Display Color</p>	<p>Select the graph's display color for when the alarm is displayed.</p>
<p>Pattern Color</p>	<p>Select the pattern color for when the alarm is displayed.</p>
<p>Blink</p>	<p>Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the alarm display's [Display Color] and [Pattern Color].</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p>☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>

◆ **Color Settings/Detail**

You can set the data range and have the Graph's color change according to that range.



Setting	Description
No. of Ranges	Set the number of ranges the graph display will be divided into, from 1 to 16.
Specify Range	<p>If the [No. of Ranges] is 2 or greater, choose how each range's min and max value will be specified. If there is only 1 range, it will be fixed as [Constant].</p> <ul style="list-style-type: none"> <li>• Constant Designate a set constant as the Min/Max value.</li> <li>• Address Designate the address where the Upper/Lower Limit values are stored.</li> </ul>
Range No.	Choose a range from among the designated ranges in [No. of Ranges] by the Min/Max value and color. In the Graph Display Sample, you can click and select the range portion you want to set. It is indicated by “(Min Value) ≤ Range No. ≤ (Max Value)”.
Min. Value/Max. Value	Set the min and max values for the range specified in [Range No.] from 0 to 100 (with [Display Sign +/-] selected, from -100 to 100). If [Specify Range] is [Constant], input a min/max value. If [Address] is set, specify the Word Address where the min/max value will be stored. The min/max values are set to equally divide the initial value of each range.

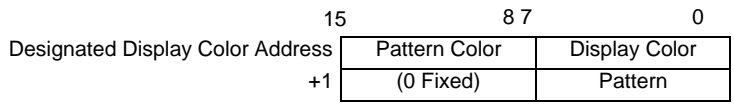
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Setting		Description
Range Settings	Color Specification	<p>Select the designation method of the display color and pattern for the range selected with [Range No.]. If the [No. of Ranges] is 2 or greater or [Color Stack] is set, this will be fixed as [Direct].</p> <ul style="list-style-type: none"> <li>• Constant Individually designate the display color and pattern.</li> <li>• Address Set the address which will store the color code and pattern code.</li> </ul> <div data-bbox="651 434 1012 697" data-label="Image"> </div> <p>☞ “◆ Changing the Graph Color from a Device/PLC” (page 17-32)</p>
	Color Stack	<p>Specify whether or not each range will be color-coded when displayed. This can only be set if the [No. of Ranges] is “2” or more.</p> <p>e.g.: No. of Ranges = 2</p> <div data-bbox="548 898 1001 1168" data-label="Diagram"> </div>

◆ **Changing the Graph Color from a Device/PLC**

In the address set in [Display Color], the lower 16 bits store the color code, and the upper 16 bits store the pattern color.

In the next address after the [Display Color], the lower 16 bits store the pattern code.












- **Color Code**

The color code is the number displayed on the color palette.

☞ “9.5.1 Setting Colors ■ Color Designation” (page 9-35)

- **Pattern Code**

Stored Value	0	1	2	3	4	5	6	7	8
Pattern									

e.g.) Display Color: D100



Display Color : D100's Bit 0 to Bit 7 stores the color code "6"

Pattern : D101's Bit 0 to Bit 7 stores the color code "8"

Pattern Color : D100's Bit 8 to Bit 16 stores the color code "2"

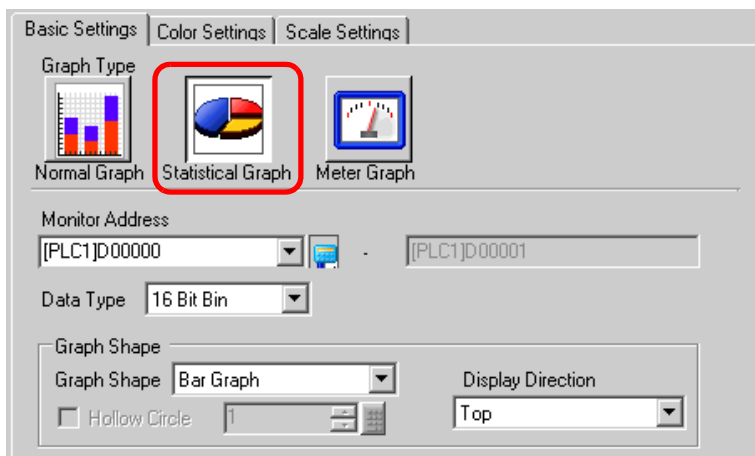


## ◆ Scale Settings

Setting	Description
Show the Large Scale	Shows the Large Scale.
Scale Divisions	Set the number of scale divisions to be displayed from 1 to 100.
Show Minor Scale	Designate whether or not to display a small scale which further divides the large scale.
Scale Divisions	Set the number of scale divisions to be displayed from 2 to 100.
Scale Color	Select the display color for the scales.
Blink	Select whether or not the [Scale Color] will blink, and the blink speed. <b>NOTE</b> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

## ■ Statistical Graph

### ◆ Basic Settings



Setting	Description
Monitor Word Address	Select the top Word Address where the statistical data will be taken from. Addresses from this address to the portion designated in the [Color] tab's [No. of Data Divisions] will be automatically allotted, and that address range will be displayed.
Data Type	Select the graph display's data type from [16 Bit Bin], [16 Bit BCD], [32 Bit Bin], [32 Bit BCD], or [32 Bit Float]. <b>NOTE</b> <ul style="list-style-type: none"> <li>Different data formats can not be used within the same Statistical Graph.</li> </ul>
Graph Shape	Choose the Graph shape from [Bar Graph] or [Circle Graph].
Display Direction	Set a direction for the graph display. If the [Graph Shape] is [Bar Graph], you can choose from [Top], [Bottom], [Left], or [Right]. <b>NOTE</b> <ul style="list-style-type: none"> <li>For [Circle Graph], the starting point is fixed at the top and will rotate clockwise. If you want to change the starting point, please rotate the part.</li> </ul>
Hollow Circle	When the [Graph Shape] is [Circle Graph], set the radius of the inner circle. <b>NOTE</b> <ul style="list-style-type: none"> <li>If you set the radius of the inner circle to less than 20 dots, the graph may not be properly displayed.</li> </ul>

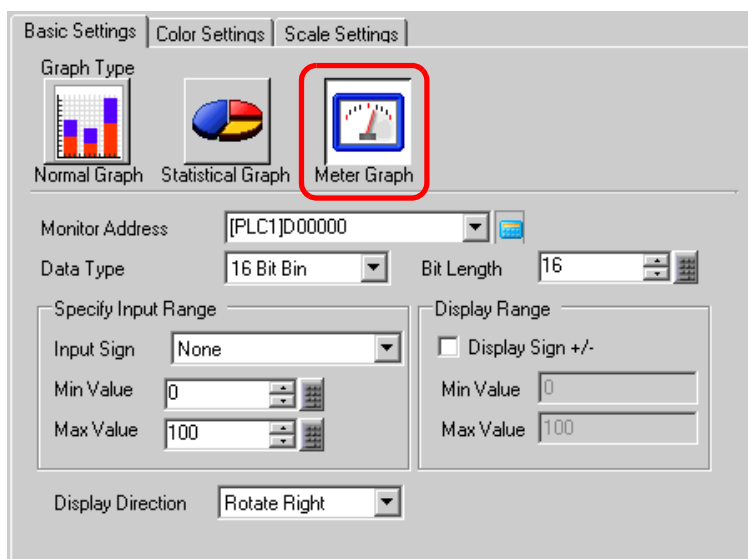
◆ Color Settings



Setting		Description
No. of Data Divisions		Set the number of data to be displayed on the graph from 1 to 16. Statistics will be taken from consecutive address data starting from the address set in [Monitor Address] for the number of addresses designated here.
Division Settings	Division No.	Displays the division range number selected in the Graph Display Sample. The Division No. depends on the Display Direction, and is assigned automatically in order from the top address.
	Display Color	Set a color for each division range. Designate the display color of each area by clicking each number of the graphs displayed on the right side.
	Pattern	Select the pattern for each division range from among 9 types.
	Pattern Color	Select a pattern color for each division range.
Border Color		Select a color for the graph's border. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Background Color		Select the background color for the graph. This color will be displayed when all data is 0. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Blink		Select whether or not the Lamp will blink, and the blink speed. You can choose different blink settings for the [Display Color], [Pattern Color], [Border Color], and [Background Color]. <b>NOTE</b> <ul style="list-style-type: none"> <li>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)</li> </ul>
Graph Display Sample		Displays a sample of how the graph will appear with the set [Display Color].

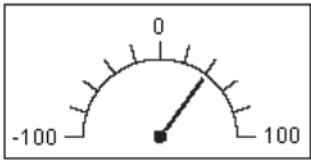
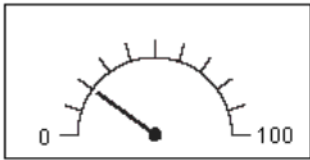
## ■ Meter Graph

### ◆ Basic Settings



Setting		Description
Monitor Word Address		The data stored in this Word Address will be displayed in the Meter Graph.
Data Type		Select the graph display's data type from [16 Bit Bin], [16 Bit BCD], [32 Bit Bin], [32 Bit BCD], or [32 Bit Float].
Bit Length		If [Data Type] is [16 Bit Bin], set the data's enabled bit length from 1 to 16.
Specify Input Range	Input Sign	Set whether graph display data will be able to handle negative numeric data. This can only be set when the [Data Type] is [16 Bit Bin] or [32 Bit Bin]. <ul style="list-style-type: none"> <li>• None Only positive numeric data will be handled.</li> <li>• 2's Complement Negative numbers are handled with 2's complement.</li> <li>• MSB Sign Negative numbers are handled with MSB sign.</li> </ul>

Continued


Setting		Description																										
Specify Input Range	Min. Value/Max. Value	<p>Select the input range for graph display data. Each [Data Type] and [Input Sign] has a different size range.</p> <table border="1"> <thead> <tr> <th>Data Type</th> <th>Input Sign</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td rowspan="3">16 Bit Bin</td> <td>None</td> <td>0 to 65535</td> </tr> <tr> <td>2's Complement</td> <td>-32,768 to 32,767</td> </tr> <tr> <td>MSB Sign</td> <td>-32767 to 32767</td> </tr> <tr> <td rowspan="3">32 Bit Bin</td> <td>None</td> <td>0 to 4294967295</td> </tr> <tr> <td>2's Complement</td> <td>-2147483648 to 2147483647</td> </tr> <tr> <td>MSB Sign</td> <td>-2147483647 to 2147483647</td> </tr> <tr> <td>16 Bit BCD</td> <td>-</td> <td>0 to 9999</td> </tr> <tr> <td>32 Bit BCD</td> <td>-</td> <td>0 to 99999999</td> </tr> <tr> <td>32 Bit Float</td> <td>-</td> <td>-9.9e<sup>16</sup> to 9.9e<sup>16</sup></td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Word address data will automatically convert to correspond to the input range, and will be displayed on the graph as a value between 1 and 1,000.</li> </ul>	Data Type	Input Sign	Range	16 Bit Bin	None	0 to 65535	2's Complement	-32,768 to 32,767	MSB Sign	-32767 to 32767	32 Bit Bin	None	0 to 4294967295	2's Complement	-2147483648 to 2147483647	MSB Sign	-2147483647 to 2147483647	16 Bit BCD	-	0 to 9999	32 Bit BCD	-	0 to 99999999	32 Bit Float	-	-9.9e <sup>16</sup> to 9.9e <sup>16</sup>
		Data Type	Input Sign	Range																								
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32 Bit Bin	None	0 to 4294967295																										
	2's Complement	-2147483648 to 2147483647																										
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16 Bit BCD	-	0 to 9999																										
32 Bit BCD	-	0 to 99999999																										
32 Bit Float	-	-9.9e <sup>16</sup> to 9.9e <sup>16</sup>																										
Display Range	Display Sign +/-	<p>Specify whether or not negative numbers will be displayed. This can only be set when the [Data Type] is [16 Bit Bin], [32 Bit Bin], or [32 Bit Float].</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> Display Sign +/-                        Negative numbers displayed                 </div> <div style="text-align: center;"> <input type="checkbox"/> Display Sign +/-                        Negative numbers not displayed                 </div> </div>																										
	Min. Value/Max. Value	Shows the display range's Min Value and Max Value. If [Display Sign +/-] is set, the Min Value is displayed as "-100". If it is not set, the Min Value is displayed as "0". The Max Value is fixed as "100".																										
	Display Direction	Select the graph's display direction from [Rotate Right] or [Rotate Left].																										

◆ Color Settings



Setting		Description
Display Color		Select the needle's color.
Border Color		Select a color for the graph's border.
Background Color		Select the background color for the graph.
Blink		<p>Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], [Border Color], and [Background Color].</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p>☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>
Alarm Settings		<p>Set whether or not the needle's color will change when the value goes outside of the set range.</p>
Alarm Range	Alarm Action	<p>Choose how the alarm range's upper and lower limit value will be specified.</p> <ul style="list-style-type: none"> <li>Constant Designate a set constant as the Min/Max value.</li> <li>Address Designate the address where the Upper/Lower Limit values are stored.</li> </ul>

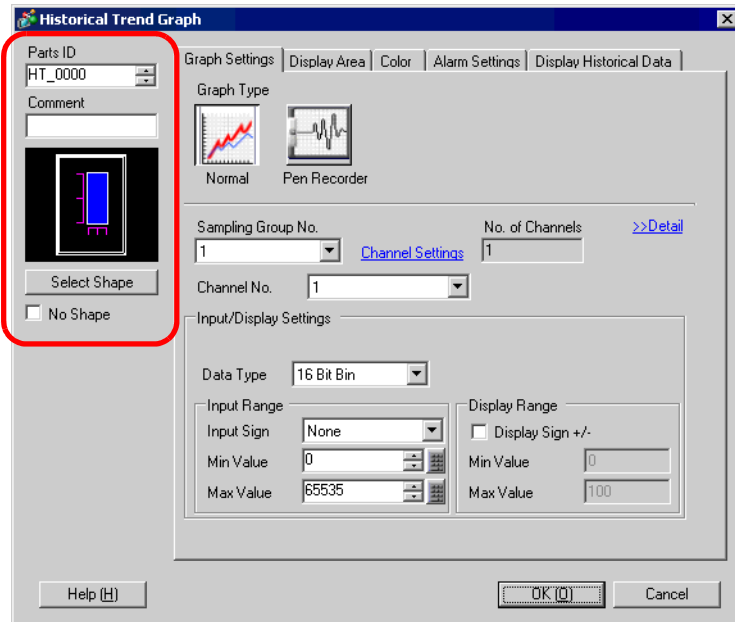
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Setting		Description
Alarm Range	Upper Limit/ Lower Limit	Set the upper and lower limits for the Alarm Range from 0 to 100 (with [Display Sign +/-] selected, from -100 to 100). If [Alarm Action] is [Constant], input an upper/lower limit value. If [Address] is set, specify the Word Address where the upper/lower limit value will be stored.
	Display Color	Select the needle color for when the Alarm is displayed.
	Blink	Select whether or not the [Display Color] will blink when the alarm is displayed, and the blink speed. <b>NOTE</b> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul>  "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

## 17.7.2 Historical Trend Graph Settings Guide

Collected (sampled) data taken at regular or random intervals can be displayed on a Line Chart.

☞ “24.8.1 Sampling Settings Guide” (page 24-37)



Setting	Description
Part ID	Placed parts are automatically assigned an ID number. Historical Graph's ID: HT_**** (4 digits) The letter portion is fixed. The number portion can be modified from 0000 to 9,999.
Comment	The comment for each Part can be up to 20 characters long.
Part Shape	Displays the shape that you chose for the part with [Select Shape].
Select Shape	Open the Select Shape dialog box to choose the Part's shape.
No Shape	Select whether or not the part will be transparent with no shape.

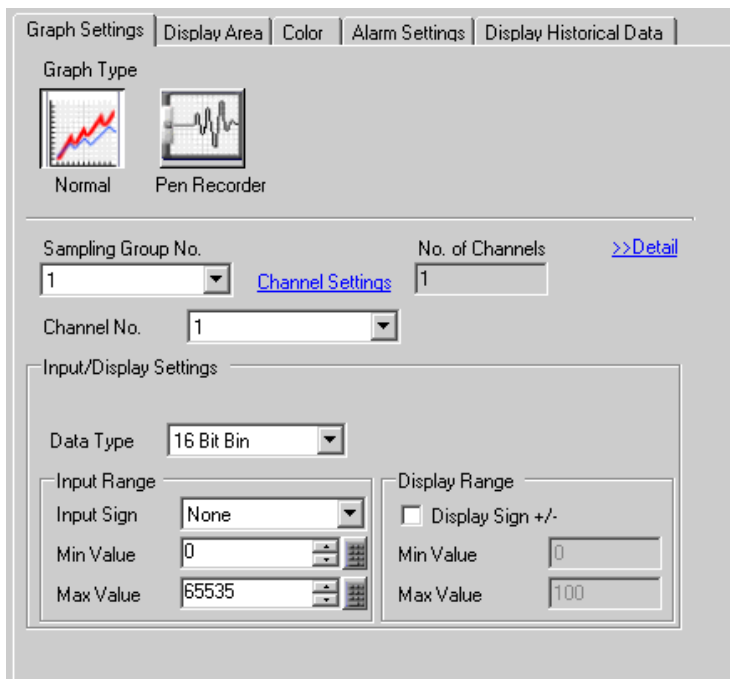
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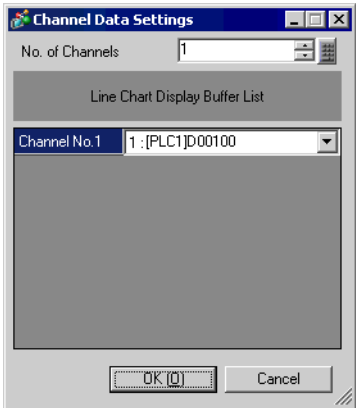


Setting	Description
<p>Graph Type</p>	<p>Select the line's shape from [Normal] or [Pen Recorder].</p> <ul style="list-style-type: none"> <li> <b>Normal</b>                      The specified word address's data changes are displayed over time in a Line Chart. Data at the start time is "0". As each sampling period elapses, the latest data is added in the specified [Display Direction]. When the graph's line reaches the limit of the Display Area, the graph is shifted in the display direction for the number of units set in [No. of Samples to Scroll].                       e.g.) Display Direction: Bottom Left, Rotate Right, Data Samples: 4, No. of Samples to Scroll: 4                 </li> </ul> <div style="text-align: center;"> </div> <ul style="list-style-type: none"> <li> <b>Pen Recorder</b>                      The specified word address's data changes are displayed over time in a Line Chart. Data at the start time is "0". The latest data always displays at the edge of the Display Area. Each time sampling occurs, the whole graph scrolls 1 spot in the set [Display Direction].                       e.g.) Display Direction: Bottom Left, Rotate Right, Data Samples: 4                 </li> </ul> <div style="text-align: center;"> </div>

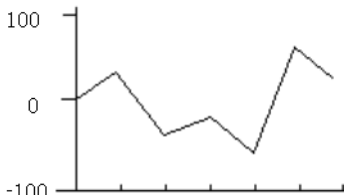
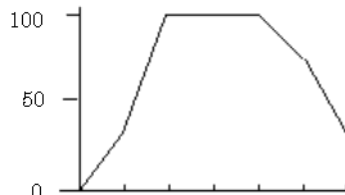
■ Normal/Pen Recorder

◆ Graph Settings/Basic



Setting	Description
Sampling Group No.	Select the sampling group number from 1 to 64 of the graph to display.
Channel Settings	<p>Open the [Channel Data Settings] dialog box. From among the designated sampling group, set the address and number of addresses (No. of Channels) of the line you want to display.</p> <p>The No. of Channels can be from 0 to 20.</p> 
No. of Channels	The set No. of Channels will be displayed in the [Channel Data Settings] dialog box. The number of channels shown here will be displayed as lines on the Graph Display Area.

Continued

Setting	Description																										
Channel No.	Select the Channel No. where you want to process Input/Display Settings.																										
Data Type	Select the graph display's data type from [16 Bit Bin], [16 Bit BCD], [32 Bit Bin], [32 Bit BCD], or [32 Bit Float].																										
Input Sign	<p>Set whether graph display data will be able to handle negative numeric data. This can only be set when the [Data Type] is [16 Bit Bin] or [32 Bit Bin].</p> <ul style="list-style-type: none"> <li>• None Only positive numeric data will be handled.</li> <li>• 2's Complement Negative numbers are handled with 2's complement.</li> <li>• MSB Sign Negative numbers are handled with MSB sign.</li> </ul>																										
Min. Value/Max. Value	<p>Select the input range for Line Chart display data. Each [Data Type] and [Input Sign] has a different size range.</p> <table border="1"> <thead> <tr> <th>Data Type</th> <th>Input Sign</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td rowspan="3">16 Bit Bin</td> <td>None</td> <td>0 to 65535</td> </tr> <tr> <td>2's Complement</td> <td>-32,768 to 32,767</td> </tr> <tr> <td>MSB Sign</td> <td>-32767 to 32767</td> </tr> <tr> <td rowspan="3">32 Bit Bin</td> <td>None</td> <td>0 to 4294967295</td> </tr> <tr> <td>2's Complement</td> <td>-2147483648 to 2147483647</td> </tr> <tr> <td>MSB Sign</td> <td>-2147483647 to 2147483647</td> </tr> <tr> <td>16 Bit BCD</td> <td>-</td> <td>0 to 9999</td> </tr> <tr> <td>32 Bit BCD</td> <td>-</td> <td>0 to 99999999</td> </tr> <tr> <td>32 Bit Float</td> <td>-</td> <td>-9.9e<sup>16</sup> to 9.9e<sup>16</sup></td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• Data collected from the sampling function will automatically convert to correspond to the input range designated here, and will be displayed on the graph as a value between 1 and 1,000.</li> </ul>	Data Type	Input Sign	Range	16 Bit Bin	None	0 to 65535	2's Complement	-32,768 to 32,767	MSB Sign	-32767 to 32767	32 Bit Bin	None	0 to 4294967295	2's Complement	-2147483648 to 2147483647	MSB Sign	-2147483647 to 2147483647	16 Bit BCD	-	0 to 9999	32 Bit BCD	-	0 to 99999999	32 Bit Float	-	-9.9e <sup>16</sup> to 9.9e <sup>16</sup>
Data Type	Input Sign	Range																									
16 Bit Bin	None	0 to 65535																									
	2's Complement	-32,768 to 32,767																									
	MSB Sign	-32767 to 32767																									
32 Bit Bin	None	0 to 4294967295																									
	2's Complement	-2147483648 to 2147483647																									
	MSB Sign	-2147483647 to 2147483647																									
16 Bit BCD	-	0 to 9999																									
32 Bit BCD	-	0 to 99999999																									
32 Bit Float	-	-9.9e <sup>16</sup> to 9.9e <sup>16</sup>																									
Display Sign +/-	<p>Specify whether or not negative numbers will be displayed. This can only be set when the [Data Type] is [Bin]. When the [Data Type] is [BCD], [Display Sign +/-] is not set. For [Float], [Display Sign +/-] is set.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><input checked="" type="checkbox"/> Display Sign +/-</p>  <p>Negative numbers displayed</p> </div> <div style="text-align: center;"> <p><input type="checkbox"/> Display Sign +/-</p>  <p>Negative numbers not displayed</p> </div> </div>																										
Min. Value/Max. Value	Shows the Min and Max Value for data displayed on the Trend Graph. If [Display Sign +/-] is set, the Min value is "-100". If it is not set, the Min Value is "0". The Max. Value is "100".																										

## ◆ Graph Settings/Detail

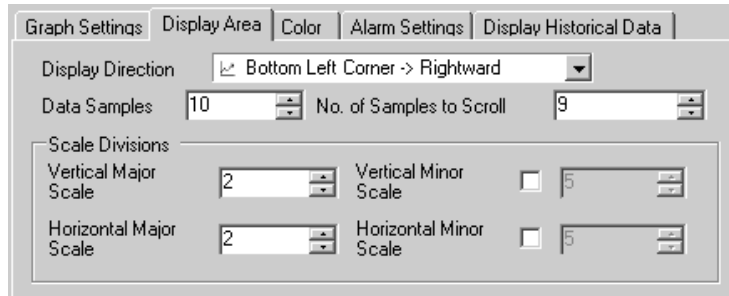
You can set Input/Display Settings for each channel.


The screenshot shows the 'Graph Settings/Detail' dialog box with the following settings:

- Graph Type: Normal (selected), Pen Recorder
- Sampling Group No.: 1
- No. of Channels: 1
- Channel No.: 1
- Input/Display Settings:
  - Block (selected), Individual
  - Data Type: 16 Bit Bin
  - Bit Length: 16
  - Input Range: Input Sign: None, Min Value: 0, Max Value: 65535
  - Display Range: Display Sign +/- (unchecked), Min Value: 0, Max Value: 100

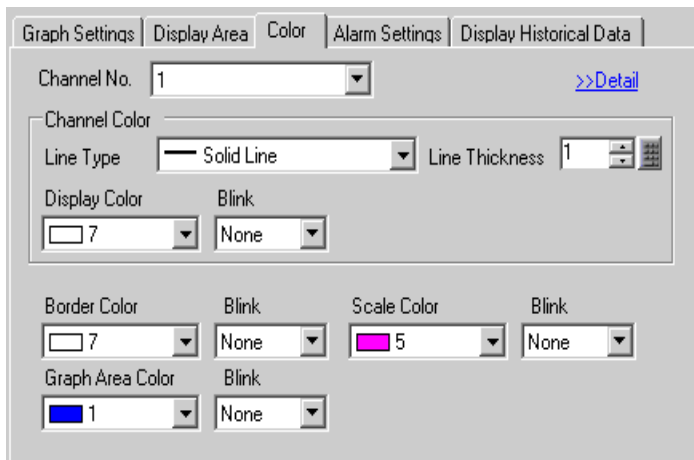
Setting	Description
Block/Individual	For [Data Type], [Input Sign], etc., select whether to change the input/display settings for all channels as a whole, or for each one separately.
Bit Length	If [Data Type] is [16 Bit Bin], set the data's enabled bit length from 1 to 16.

## ◆ Display Area



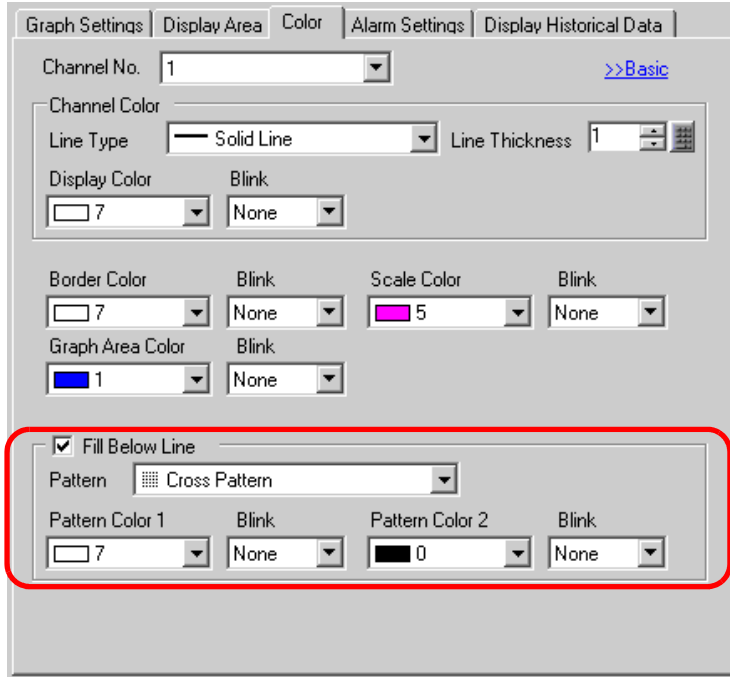
Setting	Description										
Display Direction	<p>Select the graph's display direction.</p> 										
Data Samples	<p>Set the number of data samples that will be displayed on a single line. The range depends on the set model's Display No. of Dots.</p> <table border="1" data-bbox="441 838 1120 1039"> <thead> <tr> <th>Display No. of Dots</th> <th>Data Samples</th> </tr> </thead> <tbody> <tr> <td>320 x 240 dots (QVGA)</td> <td>0 to 319</td> </tr> <tr> <td>640 x 480 dots (VGA)</td> <td>0 to 639</td> </tr> <tr> <td>800 x 600 dots (SVGA)</td> <td>0 to 799</td> </tr> <tr> <td>1024 x 768 dots (XGA)</td> <td>0 to 799</td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>You can verify the Display No. of Dots with [System Settings] - [Device Settings].</li> <li>When [Fill Below Line] is set, the [Data Samples] will have a maximum of 97.</li> </ul>	Display No. of Dots	Data Samples	320 x 240 dots (QVGA)	0 to 319	640 x 480 dots (VGA)	0 to 639	800 x 600 dots (SVGA)	0 to 799	1024 x 768 dots (XGA)	0 to 799
Display No. of Dots	Data Samples										
320 x 240 dots (QVGA)	0 to 319										
640 x 480 dots (VGA)	0 to 639										
800 x 600 dots (SVGA)	0 to 799										
1024 x 768 dots (XGA)	0 to 799										
No. of Samples to Scroll	<p>Select the number of data that will be scrolled when the graph fills the Display Area. This can only be set when the Graph Type is [Normal]. Set this within the range designated by [Data Samples].</p>										
Vertical Major Scale/Minor Scale	<p>Set whether or not to display the major and minor scale on the Line Chart's Y-axis. If so, choose the number of divisions. The number of divisions can be set from 1 to 638 for Major Scale, and from 2 to 638 for Minor Scale.</p>										
Horizontal Major Scale/Minor Scale	<p>Set whether or not to display the major and minor scale on the Line Chart's X-axis. If so, choose the number of divisions. The number of divisions can be set from 1 to 638 for Major Scale, and from 2 to 638 for Minor Scale.</p>										

◆ Color/Basic



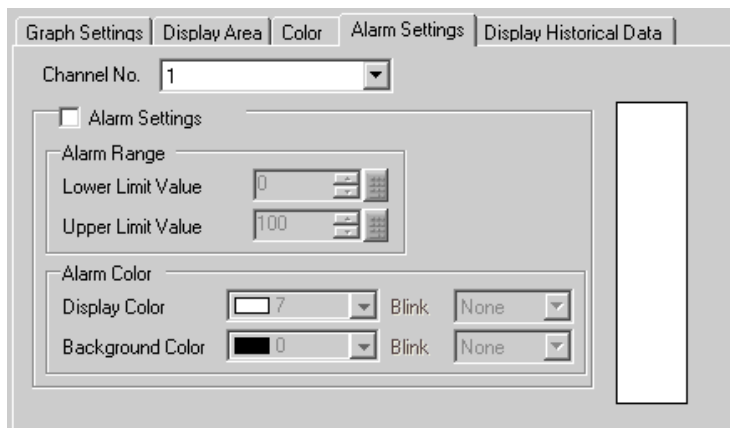
Setting	Description
Channel No.	Select the Channel No. where you want to configure color settings.
Line Type	Select the type of line from among 5 kinds: Solid Line, Dashed Line, Dash Line, Chain Line, and Two-Dot Chain Line. <b>NOTE</b> <ul style="list-style-type: none"> <li>When the data's display spacing is less than 16 dots, line types other than the solid line may not display correctly.</li> </ul>
Line Thickness	Set the line's thickness from 1 to 2.
Display Color	Set the line's color.
Background Color	Set the line's background color.
Border Color	Set the border color of the Historical Trend Graph. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Scale Color	Select the graph's scale color. <b>NOTE</b> <ul style="list-style-type: none"> <li>Some settings cannot be set depending on the part that you chose with [Select Shape].</li> </ul>
Graph Area Color	Select a color for the Graph Display Area.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Display Color], [Background Color], [Border Color], [Scale Color], and [Graph Area Color]. <b>NOTE</b> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)

◆ Color/Detail



Setting	Description
Fill Below Line	Select whether or not to fill in the area under the Line Chart. This can only be set when [No. of Channels] is 1. <b>NOTE</b> <ul style="list-style-type: none"> <li>This can not be set when alarms are being used.</li> </ul>
Pattern	Select a pattern for the lower area fill from 9 kinds of pattern.
Pattern Color 1	Select the pattern's color.
Pattern Color 2	Set the pattern's background color.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for [Pattern Color 1] and [Pattern Color 2]. <b>NOTE</b> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p>☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>

◆ Alarm Settings

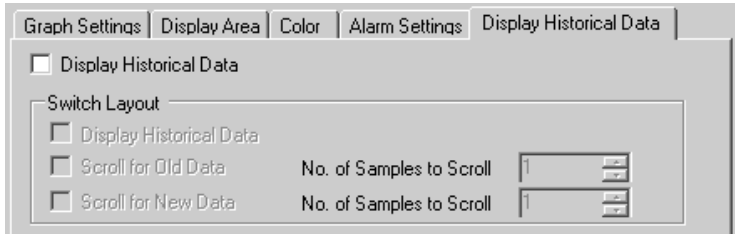


Setting	Description														
Channel No.	Select the Channel No. where you want to configure Alarm Settings.														
Alarm Settings	If set, the displayed color changes when the value goes outside of a designated range.														
Upper Limit/Lower Limit	Set the Alarm Display's range from 0 to 100 (with [Display Sign +/-] selected, from -100 to 100).														
Display Color	<p>Select the Alarm Display color. The Alarm Display color will appear as follows.</p> <p>e.g.) Upper Limit Value = 80, Lower Limit Value = 30</p> <table border="1"> <thead> <tr> <th colspan="2">Sampling Data</th> </tr> </thead> <tbody> <tr> <td>1st Sample</td> <td>0</td> </tr> <tr> <td>2nd Sample</td> <td>25</td> </tr> <tr> <td>3rd Sample</td> <td>75</td> </tr> <tr> <td>4th Sample</td> <td>50</td> </tr> <tr> <td>5th Sample</td> <td>100</td> </tr> <tr> <td>6th Sample</td> <td>25</td> </tr> </tbody> </table>	Sampling Data		1st Sample	0	2nd Sample	25	3rd Sample	75	4th Sample	50	5th Sample	100	6th Sample	25
Sampling Data															
1st Sample	0														
2nd Sample	25														
3rd Sample	75														
4th Sample	50														
5th Sample	100														
6th Sample	25														
Background Color	Select the background color for when the Alarm is displayed.														
Blink	<p>Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the alarm color's [Display Color] and [Background Color].</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p>☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>														
Color Range Display Bar	Displays a sample of how each range's color will look. Any alarm ranges specified in [Alarm Settings] will also be displayed.														



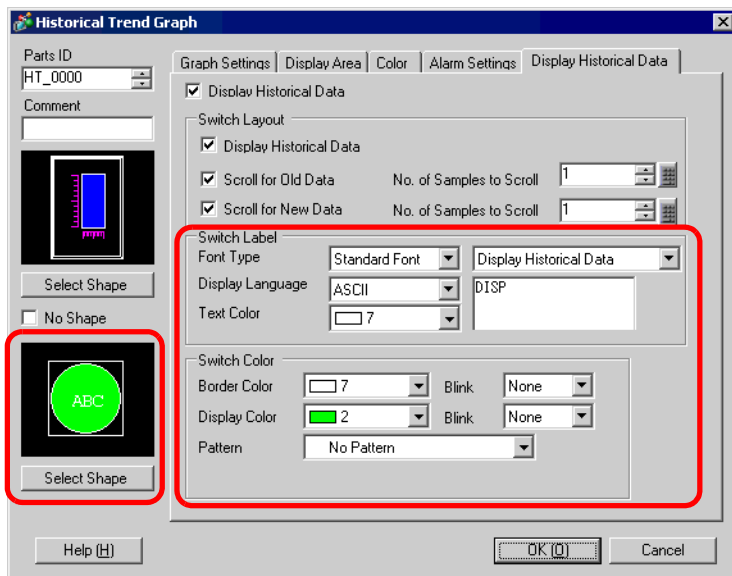
◆ **Display Historical Data**

Configure settings to display data that came before the currently displayed data (called “Historical Data”).



Setting		Description
Display Historical Data		Set whether or not to display historical data.
Switch Layout	Display Historical Data	Set whether or not to place a switch on the screen to change the display mode of historical data. When you press the placed switch, the graph changes to Display Historical Data mode, and you can then go back and view past data by scrolling. When you press the switch again, Display Historical Data mode is cancelled, and the display returns to the current value. Only one switch of this kind can be placed on a Graph using Display Historical Data.
	Scroll for Old Data	Set whether or not to place a switch to scroll backward from currently displayed data to past data. Multiple switches of this kind can be placed on a Graph using Display Historical Data.
	No. of Samples to Scroll	Set the no. of samples to scroll. The value can be from 1 to 65,535.
	Scroll for New Data	Set whether or not to place a switch to scroll forward from currently displayed data to the latest data. Multiple switches of this kind can be placed on a Graph using Display Historical Data.
	No. of Samples to Scroll	Set the no. of samples to scroll. The value can be from 1 to 65,535.

If switches to Display Historical Data are set, set the labels and colors of those switches.



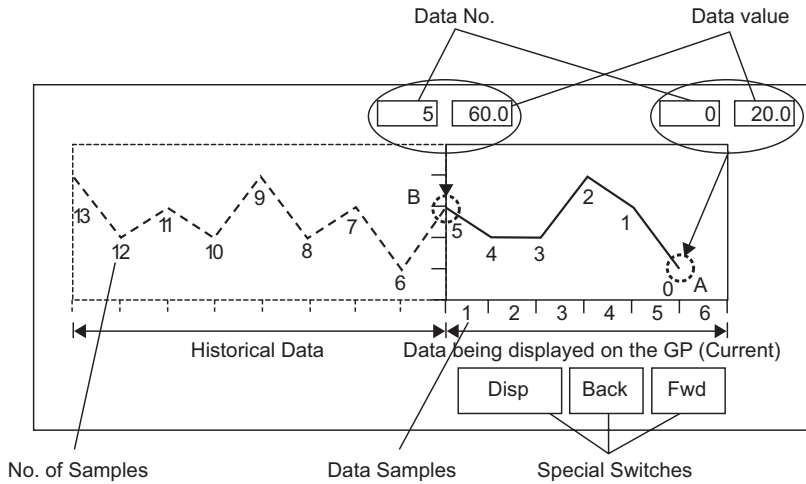
Setting		Description
Switch Label	Font Type	Set the font type for the switch's label from [Standard Font] or [Stroke Font].
	Display Language	Select the language that will be displayed on the switch label. Choose from [ASCII], [Japanese], [Chinese (Traditional)], [Chinese (Simplified)], [Korean], [Cyrillic], or [Thai].
	Select Switch	Select the Switch whose label you want to set.
	Label	Enter the text that you want to display on the switch selected in [Select Switch].
	Text Color	Set a color for the label's text.
	Blink	Select whether or not the [Text Color] will blink, and the blink speed.
Switch Color	Border Color	Set the border color for the switch selected in [Select Switch].
	Display Color	Set the color for the switch selected in [Select Switch].
	Pattern	Set the pattern for the switch selected in [Select Switch].
	Pattern Color	Set the pattern color for the switch selected in [Select Switch].
	Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the [Border Color], [Display Color], and [Pattern Color]. <b>NOTE</b> <ul style="list-style-type: none"> <li>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)</li> </ul>
Select Shape	Open the Select Shape dialog box to choose the switch's shape.	
Status Display	Displays the shape and status of the switch selected in [Select Shape].	

## ■ Display Historical Data

To display historical data on the GP screen, you need to use a Historical Data switch. For the switch, you can use a Historical Trend Graph or a Switch Lamp [Special Switch].

When using a Historical Trend Graph featuring the Display Historical Data function, the excluded dotted-line portion will be displayed on the GP screen. By touching the Display Historical Data Switch, past data stored in the GP can be viewed on the graph display.

e.g.) No. of Samples Taken: 14, Data Samples (shown): 6



## ◆ Data No./Data Value

Data Numbers are assigned to data values, with the most recent data value (sampling data) designated as Data No. 0. The data values are stored after being automatically numbered in reverse chronological order, starting with the most recent numbered as “0”, followed by “1”, “2”, “3”, etc.

When a Historical Trend Graph with the Display Historical Data function is displayed on the GP, the data numbers and data values of the latest data (picture portion A) and the oldest data (picture portion B) are automatically stored in the GP internal device’s Special Relay Area (LS9000~). Data numbers are stored in the LS area as binary numbers in the range of 0 to 65,237. The data type is Bin.

(To explain the previous page’s picture, the data numbers and data values of portion A and B are displayed below.)

The data numbers and data values are stored even if the graph is not in Display Historical Data mode.

Special Area	
LS9000	Data No.
LS9001	Data of Line 1
LS9002	Data of Line 2
LS9003	Data of Line 3
:	:
LS9020	Data of Line 19
LS9021	Data of Line 20
LS9022	Reserved
:	:
LS9029	Data No.
LS9030	Data of Line 1
LS9031	Data of Line 2
LS9032	Data of Line 3
LS9033	Data of Line 3
:	:
LS9049	Data of Line 19
LS9050	Data of Line 20
LS9051	Reserved
:	:
LS9059	Reserved
LS9060	Reserved
:	:

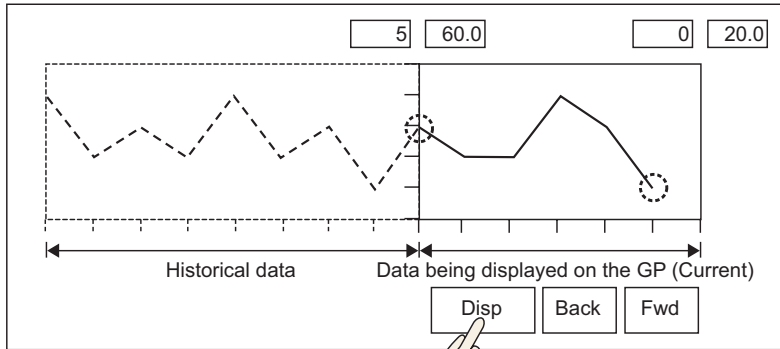
Storage area for the oldest data that can be displayed on the GP screen (Data No is [5] and Data Value is [60] in the previous page’s graph.)  
**Picture portion B**

Storage area for the most recent data that can be displayed on the GP screen (Data No is [0] and Data Value is [20] in the previous page’s graph.)  
**Picture portion A**

### IMPORTANT

- When a screen change occurs, all data stored in the GP internal device Special Area (LS9000-) is cleared to 0.
- Each data is saved as a value from 0 to 1,000 as a ratio of the input data value (when [Display Sign +/-] is set, from -1,000 to 1,000). (An automatically converted value for the display data).
- For example, to display the data value “200” as “20.0” in a Data Display, set the [No. of Decimal Digits] to “1”.

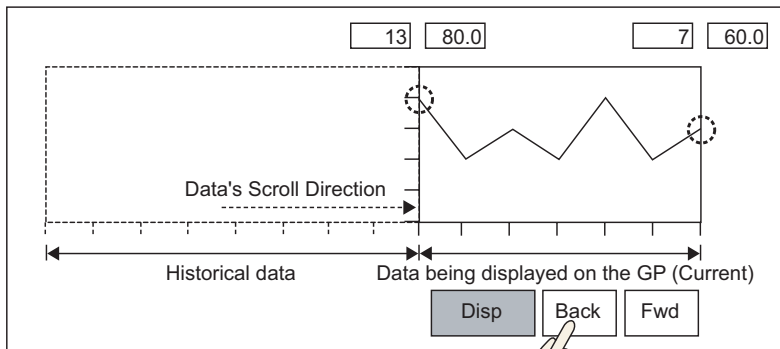
◆ Display Historical Data Examples



↓ Press the [Disp] switch to enable Display Historical Data mode. The switch is in reverse display. It remains in reverse display while in Display Historical Data mode.

Touching the “Back” switch scrolls the data backward by the predetermined scroll number and displays previous data records.

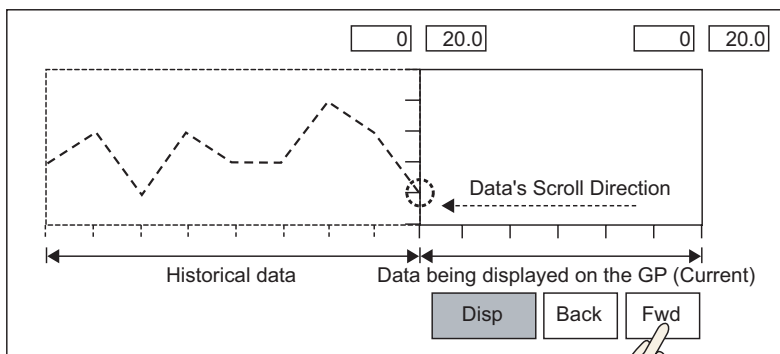
Touching the “Back” switch while the oldest data stored in backup SRAM is being displayed causes the buzzer to sound three times. The data cannot be scrolled further.



↓ Next press the [Fwd] Switch.

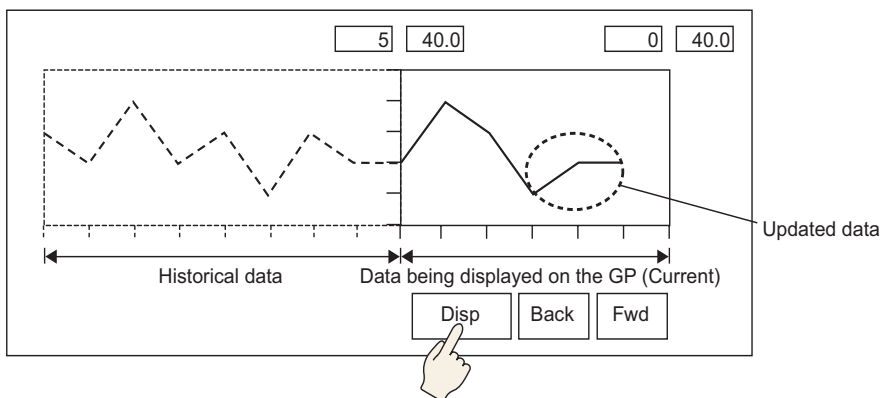
Touching the “Fwd” switch scrolls the data forward towards the newest data by the set scroll number.

When you scroll to the newest data after changing to Display Historical Data mode, nothing will be displayed. If the [Fwd] switch is touched again while the display is blank, a buzzer sounds three times. The data cannot be scrolled further.



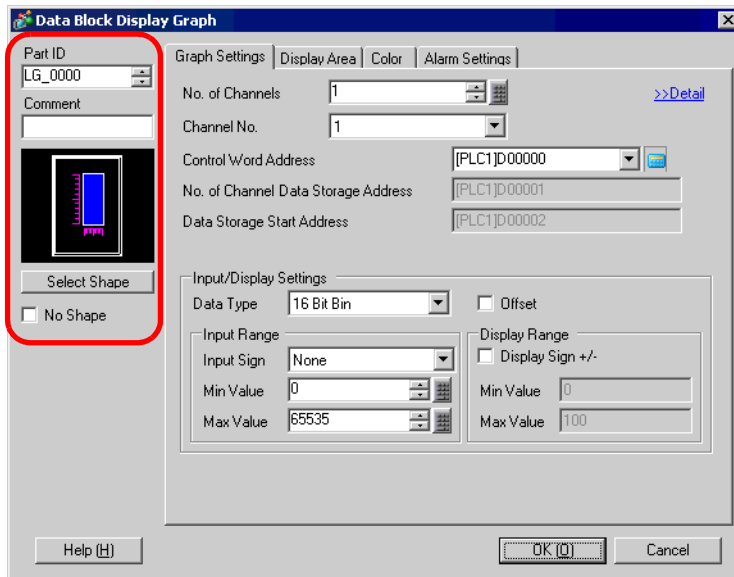
Press the [Disp] Switch again and the Past Data Display mode is cleared.

Sampled data is displayed while displaying Historical Data.



### 17.7.3 Data Block Display Graph Settings Guide

Displays the current value of multiple addresses on a single graph.



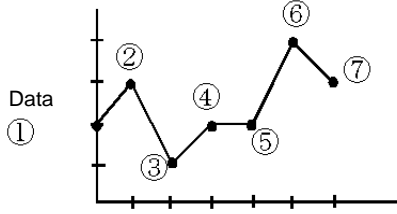
Setting	Description
Part ID	Placed parts are automatically assigned an ID number. Data Block Display's ID: LG_**** (4 digits) The letter portion is fixed. The number portion can be modified from 0000 to 9,999.
Comment	The comment for each Part can be up to 20 characters long.
Part Shape	Displays the shape that you chose for the part with [Select Shape].
Select Shape	Open the Select Shape dialog box to choose the Part's shape.
No Shape	Select whether or not the part will be transparent with no shape.

## ■ Graph Settings/Basic

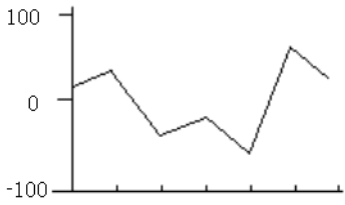
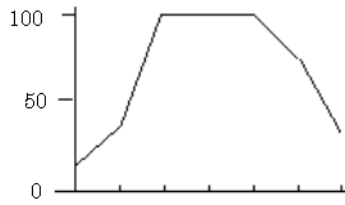
Setting	Description																																				
No. of Channels	Select the number of channels that will be displayed on the graph. The value can be from 1 to 20.																																				
Channel No.	Choose the channel (data line) that you want to set. Change to the numbers of the channels set in [No. of Channels] and configure input/display settings.																																				
Control Word Address	<p>Set the address which will control the displaying/clearing of the graph. This address' bit 0 and bit 1 control when the graph is displayed and cleared.</p> <ul style="list-style-type: none"> <li>When "1" is stored in the address (bit 0 is ON), the graph is displayed.                     <div style="margin-left: 40px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 0 10px;">Control</td> <td style="padding: 0 10px;">15</td> <td style="padding: 0 10px;">03</td> <td style="padding: 0 10px;">02</td> <td style="padding: 0 10px;">01</td> <td style="padding: 0 10px;">00</td> </tr> <tr> <td></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px; background-color: #cccccc;"></td> <td style="width: 20px; height: 15px; background-color: #cccccc;"></td> </tr> </table> </div> </li> <li>When "2" is stored in the address (bit 1 is ON), the displayed graph is cleared.                     <div style="margin-left: 40px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 0 10px;">Control</td> <td style="padding: 0 10px;">15</td> <td style="padding: 0 10px;">03</td> <td style="padding: 0 10px;">02</td> <td style="padding: 0 10px;">01</td> <td style="padding: 0 10px;">00</td> </tr> <tr> <td></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px; background-color: #cccccc;"></td> <td style="width: 20px; height: 15px;"></td> </tr> </table> </div> </li> <li>When "3" is stored in the address (bit 0 and bit 1 are ON), the displayed graph is temporarily cleared and then displayed again.                     <div style="margin-left: 40px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 0 10px;">Control</td> <td style="padding: 0 10px;">15</td> <td style="padding: 0 10px;">03</td> <td style="padding: 0 10px;">02</td> <td style="padding: 0 10px;">01</td> <td style="padding: 0 10px;">00</td> </tr> <tr> <td></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px;"></td> <td style="width: 20px; height: 15px; background-color: #cccccc;"></td> <td style="width: 20px; height: 15px; background-color: #cccccc;"></td> </tr> </table> </div> </li> </ul> <p>This can be set to either a device/PLC address or GP internal device address.                      🖱️ "17.6.1 Details" (page 17-19)</p>	Control	15	03	02	01	00							Control	15	03	02	01	00							Control	15	03	02	01	00						
Control	15	03	02	01	00																																
Control	15	03	02	01	00																																
Control	15	03	02	01	00																																

Continued



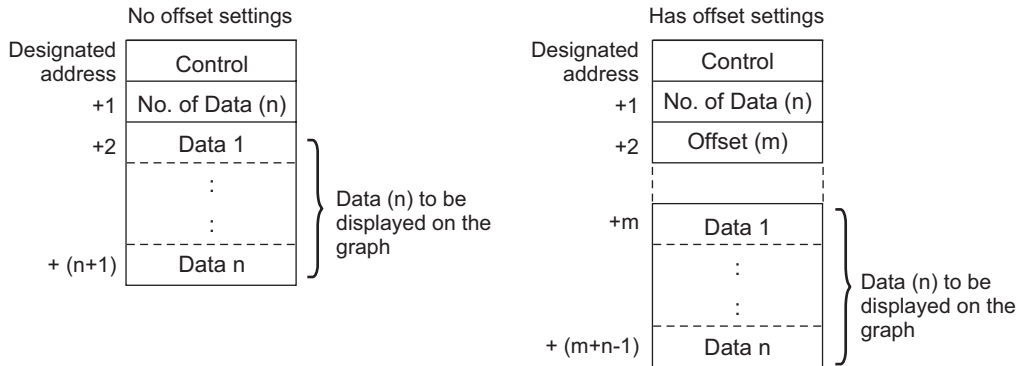
Setting	Description
No. of Channel Data Storage Address	<p>Displays the address at [Control Word Address] + 1. This address stores the number of data lines that will be displayed on the graph. When displaying the graph, this will become the number of points.</p> <p>e.g.) Number of data entries: 7</p> 
Data Storage Start Address/Offset Value Storage Address	<p>Displays the address at [Control Word Address] + 2. This address is the start address which stores the data to be displayed on the graph. When an [Offset] is set, this changes to the [Offset Value Storage Address].</p>
Input Display Settings	<p>Data Type</p> <p>Select the graph display's data type from [16 Bit Bin], [16 Bit BCD], [32 Bit Bin], [32 Bit BCD], or [32 Bit Float].</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• If [Individual] is selected in the Detail Settings, individual channels settings can be modified.</li> <li>• If [Show Scale] is selected in the Detail Settings, only [16 Bit Bin] or [32 Bit Bin] can be set.</li> </ul>
	<p>Offset</p> <p>Select whether or not to display an offset on the graph.</p> <p>☞ “◆ Data Block Display Graph” (page 17-59)</p>
	<p>Input Sign</p> <p>Set whether graph display data will be able to handle negative numeric data. This can only be set when the [Data Type] is [16 Bit Bin] or [32 Bit Bin].</p> <ul style="list-style-type: none"> <li>• None Only positive numeric data will be handled.</li> <li>• 2's Complement Negative numbers are handled with 2's complement.</li> <li>• MSB Sign Negative numbers are handled with MSB sign.</li> </ul>

Continued

Setting		Description																										
Input Display Settings	Min. Value/Max. Value	<p>Select the input range for graph display data. Each [Data Type] and [Input Sign] has a different size range.</p> <table border="1"> <thead> <tr> <th>Data Type</th> <th>Input Sign</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td rowspan="3">16 Bit Bin</td> <td>None</td> <td>0 to 65535</td> </tr> <tr> <td>2's Complement</td> <td>-32,768 to 32,767</td> </tr> <tr> <td>MSB Sign</td> <td>-32767 to 32767</td> </tr> <tr> <td rowspan="3">32 Bit Bin</td> <td>None</td> <td>0 to 4294967295</td> </tr> <tr> <td>2's Complement</td> <td>-2147483648 to 2147483647</td> </tr> <tr> <td>MSB Sign</td> <td>-2147483647 to 2147483647</td> </tr> <tr> <td>16 Bit BCD</td> <td>-</td> <td>0 to 9999</td> </tr> <tr> <td>32 Bit BCD</td> <td>-</td> <td>0 to 99999999</td> </tr> <tr> <td>32 Bit Float</td> <td>-</td> <td>- 9.9e<sup>16</sup> to 9.9e<sup>16</sup></td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Each word address' data will automatically convert to correspond to the input range, and will be displayed on the graph as a value between 1 and 1,000.</li> </ul>	Data Type	Input Sign	Range	16 Bit Bin	None	0 to 65535	2's Complement	-32,768 to 32,767	MSB Sign	-32767 to 32767	32 Bit Bin	None	0 to 4294967295	2's Complement	-2147483648 to 2147483647	MSB Sign	-2147483647 to 2147483647	16 Bit BCD	-	0 to 9999	32 Bit BCD	-	0 to 99999999	32 Bit Float	-	- 9.9e <sup>16</sup> to 9.9e <sup>16</sup>
	Data Type	Input Sign	Range																									
	16 Bit Bin	None	0 to 65535																									
2's Complement		-32,768 to 32,767																										
MSB Sign		-32767 to 32767																										
32 Bit Bin	None	0 to 4294967295																										
	2's Complement	-2147483648 to 2147483647																										
	MSB Sign	-2147483647 to 2147483647																										
16 Bit BCD	-	0 to 9999																										
32 Bit BCD	-	0 to 99999999																										
32 Bit Float	-	- 9.9e <sup>16</sup> to 9.9e <sup>16</sup>																										
Display Sign +/-	<p>Specify whether or not negative numbers will be displayed. This can only be set when the [Data Type] is [Bin]. When the [Data Type] is [BCD], [Display Sign +/-] is not set. For [Float], [Display Sign +/-] is set.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> Display Sign +/-                Negative numbers displayed         </div> <div style="text-align: center;"> <input type="checkbox"/> Display Sign +/-                Negative numbers not displayed         </div> </div>																											
Min. Value/Max. Value	<p>Displays the range's Min/Max Value to be displayed on the graph. If [Display Sign +/-] is set, the Min Value is "-100". If it is not set, the Min Value is "0". The Max Value is "100".</p>																											

◆ **Data Block Display Graph**

When using the Data Block Display feature, you need to reserve the areas for the number of addresses specified below, beginning from the specified Control Word Address. The Control Word Address can be set to either a device/PLC address or GP internal device address. Configure offset settings and you can set the graph display data in an address shifted down from the address storing the [No. of Data].



- NOTE**
- [Control], [No. of Data] and [Offset] are all fixed as 16 bit.
  - For 32 bit devices, the lower 16 bits will be enabled. Please enter [0] for the upper 16 bits.

32 bit device		
	31	16 15 0
+0	0	Control
+1	0	No. of Data
+2	0	Offset

When you want to control the graph display from a device/PLC, the graph's display speed will differ depending on if you set the [Control Word Address] to a device address or use the GP's Internal Read Area.

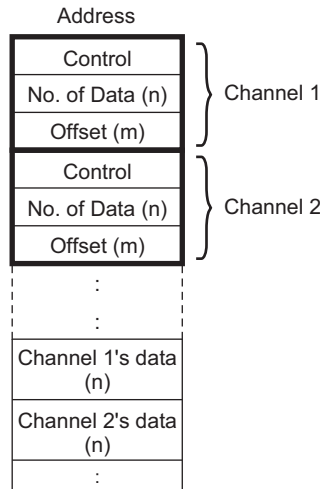
**When setting a device/PLC address**

After the "control" display bit (bit 0) turns ON, the time to read out data from the device/PLC to GP and display is on the graph will be longer than the time when the GP Internal Device is used. However, when the graph is not displayed, the time taken to display the whole screen is less than with the GP Internal Device setting.

**GP Internal Device When using the read area**

The Read Area constantly reads out data from the device/PLC to the GP, regardless of screen display status. Therefore, after the "control" display bit (bit 0) turns ON, the time to display the graph will be shorter than when using a device/PLC address. However, when the Read Area size is large, the entire screen display time will be slower than when using a device/PLC address.

- NOTE**
- To use the GP Internal Device's Read Area, you need to set: System Settings [Main Unit Settings] - [System Area Settings] tab's [Read Area Size]. A maximum of 256 words can be set.
  - When setting a device/PLC address and displaying multiple data lines (channel) with Block Display, enable offset settings to improve the graph's display speed. By setting all the data in continuous addresses as in the following, data can be easily read in one communication round.



## ■ Graph Settings/Detail

Configure input/display settings for each channel's Data Type, Input Sign, etc.

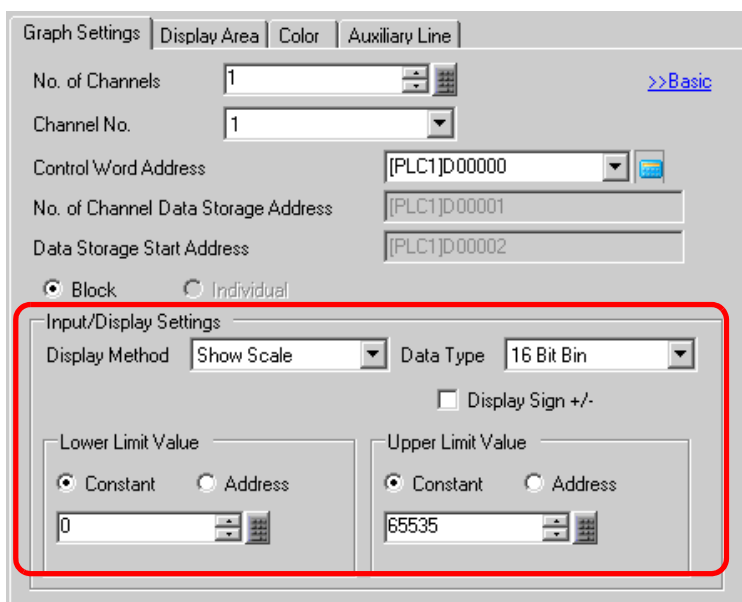
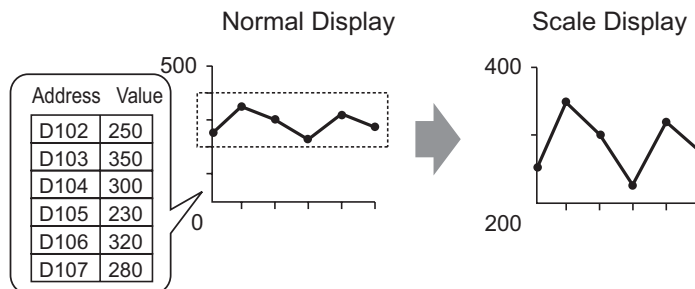
The screenshot shows the 'Graph Settings' dialog box with several tabs: 'Graph Settings', 'Display Area', 'Color', and 'Alarm Settings'. The 'Graph Settings' tab is active. The following settings are visible:

- No. of Channels: 1
- Channel No.: 1
- Control Word Address: [PLC1]D00000
- No. of Channel Data Storage Address: [PLC1]D00001
- Data Storage Start Address: [PLC1]D00002
- Block  Individual
- Input/Display Settings:
  - Display Method: Specify Range
  - Bit Length: 16
- Data Type: 16 Bit Bin
- Offset
- Display Range:
  - Display Sign +/-
  - Min Value: 0
  - Max Value: 100
- Input Range:
  - Input Sign: None
  - Min Value: 0
  - Max Value: 65535

Setting	Description
Block/Individual	For the Data Type, Input Sign, etc., select whether to change the input/display settings for all channels as a whole, or for each one separately. When the [Display Method] is selected as [Show Scale], this setting is fixed as [Block].
Display Method	Select whether or not to display a specified range of the graph. When [Show Scale] is set, Alarm Settings and the [Color] tab's [Fill Below Line] option cannot be set. ☞ “◆ Show Scale” (page 17-62)
Bit Length	If [Data Type] is [16 Bit Bin], set the data's enabled bit length from 1 to 16.

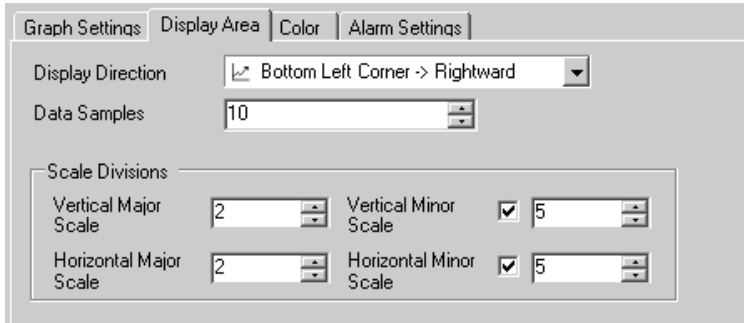
◆ **Show Scale**


Displays only the specified range of the graph. When data is concentrated in a fixed range, this is useful for verifying details.



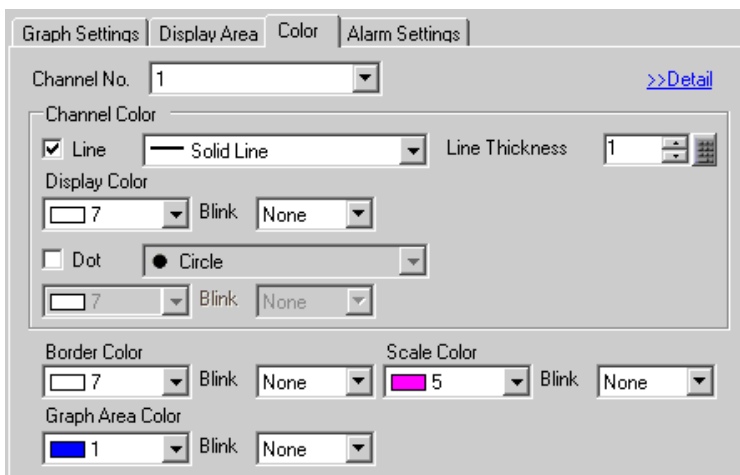
Setting	Description													
Data Type	Choose the graph's data type from [16 Bit Bin] or [32 Bit Bin].													
Display Sign +/-	Specify whether or not negative numbers will be displayed.													
Upper Limit/Lower Limit	<p>Select the method for how the scale's upper and lower limit value will be set from [Constant] or [Address], and set the Upper and Lower Limit Value.</p> <ul style="list-style-type: none"> <li>• Constant Designate a set constant as the Min/Max value.</li> <li>• Address Designate the address where the Upper/Lower Limit values are stored.</li> </ul> <table border="1" data-bbox="422 1522 1140 1688"> <thead> <tr> <th>Data Type</th> <th>Display Sign +/-</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td rowspan="2">16 Bit Bin</td> <td>Unchecked</td> <td>0 to 65535</td> </tr> <tr> <td>Checked</td> <td>-32,768 to 32,767</td> </tr> <tr> <td rowspan="2">32 Bit Bin</td> <td>Unchecked</td> <td>0 to 4294967295</td> </tr> <tr> <td>Checked</td> <td>-2147483648 to 2147483647</td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• If [Display Sign +/-] is set, negative numbers will be handled with the 2's complement system.</li> </ul>	Data Type	Display Sign +/-	Range	16 Bit Bin	Unchecked	0 to 65535	Checked	-32,768 to 32,767	32 Bit Bin	Unchecked	0 to 4294967295	Checked	-2147483648 to 2147483647
Data Type	Display Sign +/-	Range												
16 Bit Bin	Unchecked	0 to 65535												
	Checked	-32,768 to 32,767												
32 Bit Bin	Unchecked	0 to 4294967295												
	Checked	-2147483648 to 2147483647												

## ■ Display Area



Setting	Description										
Display Direction	<p>Select the graph's display direction.</p> 										
Data Samples	<p>Set the number of data samples that will be displayed on a single line. The range depends on the set model's Display No. of Dots.</p> <table border="1" data-bbox="418 852 1096 1051"> <thead> <tr> <th>Display No. of Dots</th> <th>Data Samples</th> </tr> </thead> <tbody> <tr> <td>320 x 240 dots (QVGA)</td> <td>0 to 319</td> </tr> <tr> <td>640 x 480 dots (VGA)</td> <td>0 to 639</td> </tr> <tr> <td>800 x 600 dots (SVGA)</td> <td>0 to 799</td> </tr> <tr> <td>1024 x 768 dots (XGA)</td> <td>0 to 799</td> </tr> </tbody> </table> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• You can verify the Display No. of Dots with [System Settings] - [Device Settings].</li> <li>• When [Fill Below Line] is set, the [Data Samples] will have a maximum of 97.</li> </ul>	Display No. of Dots	Data Samples	320 x 240 dots (QVGA)	0 to 319	640 x 480 dots (VGA)	0 to 639	800 x 600 dots (SVGA)	0 to 799	1024 x 768 dots (XGA)	0 to 799
Display No. of Dots	Data Samples										
320 x 240 dots (QVGA)	0 to 319										
640 x 480 dots (VGA)	0 to 639										
800 x 600 dots (SVGA)	0 to 799										
1024 x 768 dots (XGA)	0 to 799										
Vertical Major Scale/ Minor Scale	<p>Set whether or not to display the major and minor scale on the Line Chart's Y-axis. If so, choose the number of divisions. The number of divisions can be set from 1 to 638 for Major Scale, and from 2 to 638 for Minor Scale.</p>										
Horizontal Major Scale/ Minor Scale	<p>Set whether or not to display the major and minor scale on the Line Chart's X-axis. If so, choose the number of divisions. The number of divisions can be set from 1 to 638 for Major Scale, and from 2 to 638 for Minor Scale.</p>										

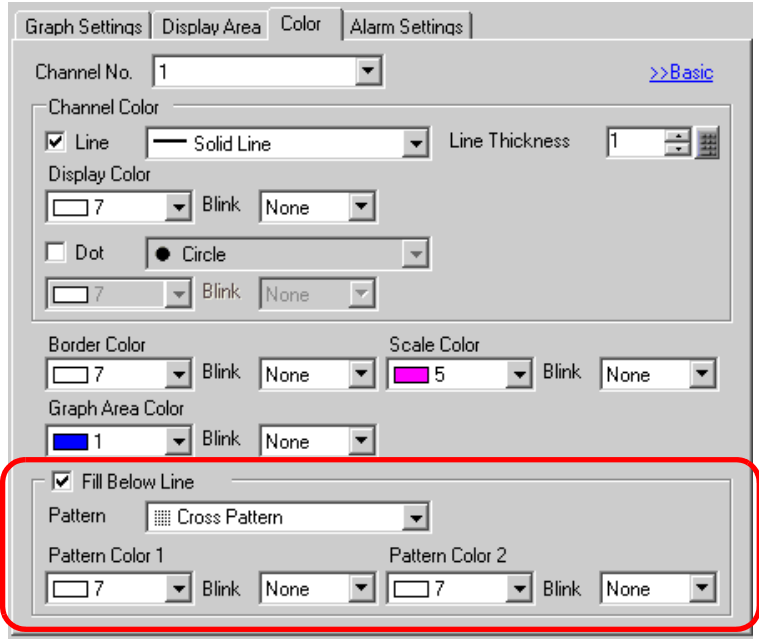
■ Color/Basic



Setting		Description
Channel No.		Select the Channel No. where you want to configure color settings.
Channel Color	Line Type	Select whether or not the Graph will display lines. If so, choose a line type from among 5 kinds: Solid Line, Dashed Line, Dash Line, Chain Line, and Two-Dot Chain Line. <b>NOTE</b> <ul style="list-style-type: none"> <li>When the data's display spacing is less than 16 dots, line types other than the solid line may not display correctly.</li> </ul>
	Line Thickness	Set the line's thickness from 1 to 2.
	Display Color	Select the data line color.
	Background Color	Select the data line's background color.
	Dot Type	Select whether or not the Graph will display dots. If so, choose a dot type from among the 7 patterns: ●, ▲, ■, ○, △, □, ×. The dot size is fixed at 5 pixels. <b>IMPORTANT</b> <ul style="list-style-type: none"> <li>This cannot be used at the same time as the [Color] tab Detail Settings' [Fill Below Line].</li> </ul>
	Display Color	Set the dot color. The dot color will not change when during Alarm Display.
Border Color		Select the border color of the Data Block Display Graph.
Scale Color		Select the graph's scale color.
Graph Area Color		Select the color of the Graph Display Area.
Blink		Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the line's [Display Color] and [Background Color], the dots' [Display Color], and the Graph's [Border Color], [Scale Color], and [Graph Area Color]. <b>NOTE</b> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)



■ Color/Detail

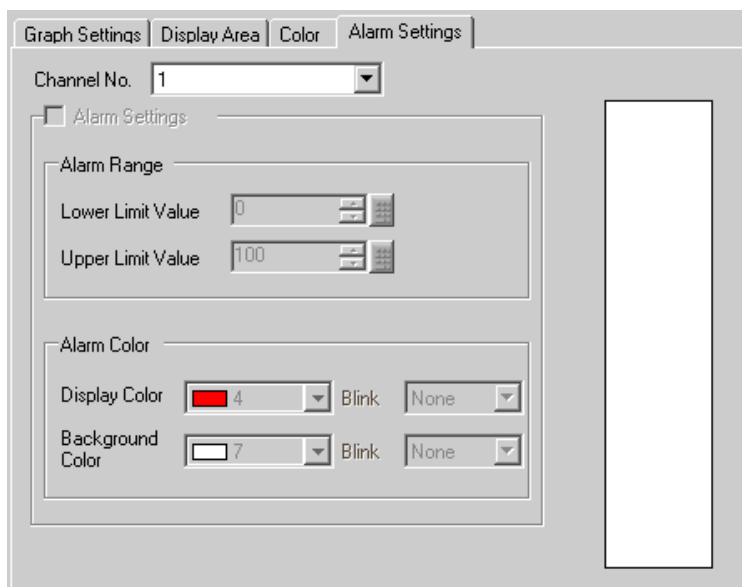


Setting	Description
Fill Below Line	Select whether or not to fill in the area under the Line Chart. This can only be set when [No. of Channels] is 1. <b>NOTE</b> <ul style="list-style-type: none"> <li>• This can not be set when alarms are being used.</li> <li>• Can not be used at the same time as [Show Scale].</li> </ul>
Pattern	Select a pattern for the lower area fill from 9 kinds of pattern.
Pattern Color 1	Select the pattern color.
Pattern Color 2	Select the pattern background color.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for [Pattern Color 1] and [Pattern Color 2]. <b>NOTE</b> <ul style="list-style-type: none"> <li>• There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p>☞ "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>

## ■ Alarm Settings

Configure settings to change the line's color when it goes outside of a set range.

**NOTE** • When [Show Scale] is set, Alarm Settings cannot be used.

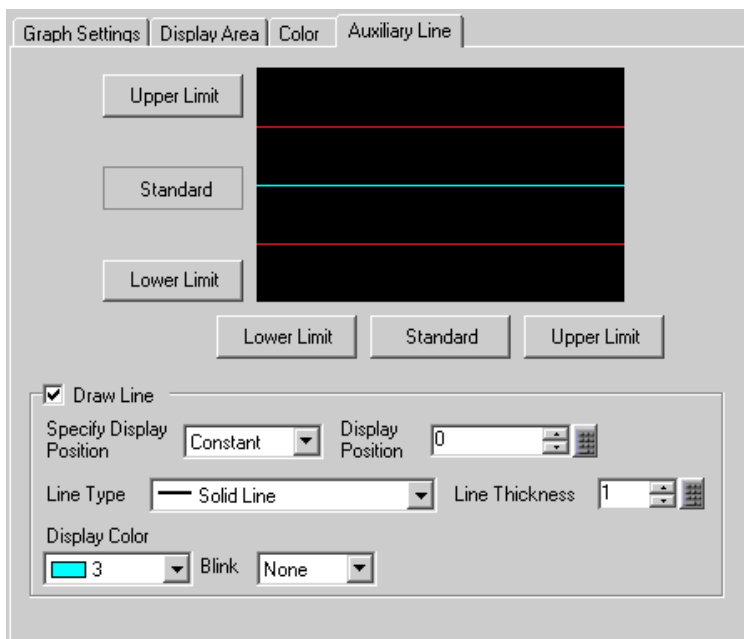
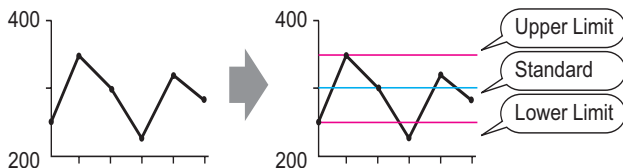


Setting	Description
Channel No.	Select the Channel No. where you want to configure Alarm Settings.
Alarm Settings	Select whether or not the color will change when the value goes outside of a set range. <b>NOTE</b> • This cannot be set if the [Fill Below Line] option is set on the [Color] tab's Detail Settings.
Upper Limit/ Lower Limit	Set the Alarm Display's range from 0 to 100 (with [Display Sign +/-] selected, from -100 to 100).
Display Color	Select the data line color during Alarm Display.
Background Color	Select the data line background color during Alarm Display.
Blink	Select whether or not the Part will blink, and the blink speed. You can choose different blink settings for the alarm color's [Display Color] and [Background Color]. <b>NOTE</b> • 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)
Color Range Display Bar	Displays a sample of the set Alarm Range's display colors.

## ■ Auxiliary Line

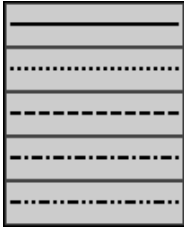

This can only be set when the [Display Method] is set to [Show Scale] on the [Graph Settings] tab's Detail Settings.

By using auxiliary lines to show the standard value or a range, you can quickly verify which data have moved away from the standard value.



Setting	Description
Upper Limit/ Standard/Lower Limit	Select the auxiliary line you want to set.
Draw Line	Set whether to draw an [Upper Limit], [Standard], or [Lower Limit] auxiliary line in the selected position.
Specify Display Position	Select the designation method of the auxiliary lines' display position from [Constant] or [Address]. <ul style="list-style-type: none"> <li>• Constant Designate a set constant as the Display Position.</li> <li>• Address Designate the address where the Display Position is stored.</li> </ul>

Continued

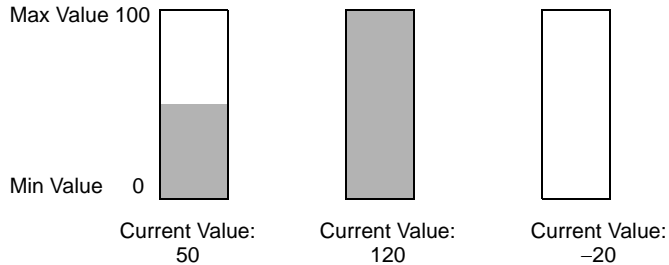
Setting	Description															
Display Position	<p>Set the auxiliary line's Display Position. The setting range for each vertical auxiliary line is as follows:</p> <table border="1" data-bbox="426 285 1204 440"> <thead> <tr> <th>Data Type</th> <th>Display Sign +/-</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>16 Bit Bin</td> <td>Unchecked</td> <td>0 to 65535</td> </tr> <tr> <td>16 Bit Bin</td> <td>Checked</td> <td>-32768 to 32767</td> </tr> <tr> <td>32 Bit Bin</td> <td>Unchecked</td> <td>0 to 4294967295</td> </tr> <tr> <td>32 Bit Bin</td> <td>Checked</td> <td>-2147483648 to 2147483647</td> </tr> </tbody> </table> <p>Set each horizontal auxiliary line from 0 to 1,000 (out of 1000%). 500 is the middle position, 1,000 is the largest position.</p>	Data Type	Display Sign +/-	Range	16 Bit Bin	Unchecked	0 to 65535	16 Bit Bin	Checked	-32768 to 32767	32 Bit Bin	Unchecked	0 to 4294967295	32 Bit Bin	Checked	-2147483648 to 2147483647
Data Type	Display Sign +/-	Range														
16 Bit Bin	Unchecked	0 to 65535														
16 Bit Bin	Checked	-32768 to 32767														
32 Bit Bin	Unchecked	0 to 4294967295														
32 Bit Bin	Checked	-2147483648 to 2147483647														
Line Type	<p>Select the auxiliary line's type from among 5 patterns.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Solid Line</p> <p>Dashed Line</p> <p>Dash Line</p> <p>Chain Line</p> <p>Two-Dot Chain Line.</p> </div> </div> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>If the Graph screen is 16 pixels or less, if you designate a pattern other than the solid line, the line pattern may not be properly displayed.</li> </ul>															
Line Thickness	Set the auxiliary line's thickness from 1 to 2.															
Display Color	Set the auxiliary line's color.															
Background Color	If you selected a line type other than the solid line, set the auxiliary line's background color.															
Blink	<p>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].</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>There are cases where you can and cannot set Blink depending on the Main Unit and System Settings' [Color Settings].</li> </ul> <p> "9.5.1 Setting Colors ■ List of Available Colors" (page 9-34)</p>															

## 17.8 Restrictions

### 17.8.1 Restrictions for Graphs

- When a value outside of the set input range is entered, the Graph Display will only show values up to (down to) the max (min) value.

e.g.) When the input range Min Value = 0, Max Value = 100



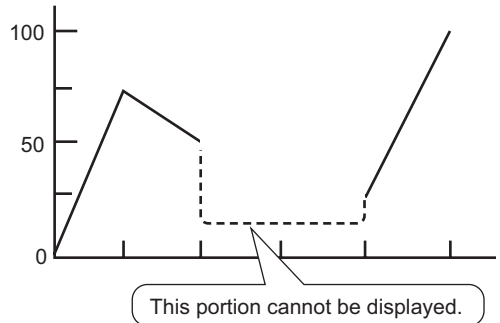
- When corrupt BCD data is entered, it will not be displayed correctly. When an inputted value becomes invalid, the previous value will be displayed. If the first inputted value is corrupt (when no previous values exist), no input will be displayed on the graph until valid input is entered.

### 17.8.2 Restrictions for Historical Trend Graphs

- A total of 8 Historical Trend Graph parts can be displayed at the same time on a single screen. When you are using a window screen, the total number of Historical Trend Graph parts that can be displayed on the base screen and window screen together is 8. When Data Block Displays are also placed on the same screen, the maximum allowed for the two kinds of parts is 8.
- The maximum number of channels (number of lines) that can be displayed on a single Historical Trend Graph is 20.
- The maximum number of channels (number of lines) that can be displayed on a single screen is 40. When you are using a window screen, the total number of channels that can be displayed on the base screen and window screen together is 40. When more than 40 lines are set up, the 41st and subsequent lines will not function.
- To draw lines within the display area on the historical trends graph, etc, place the graph on a base screen numbered 9000-9999, then begin to draw. If you draw scale lines within the graph display area on a base screen numbered 1-8999, the scale lines will not be displayed on the GP. To display a graph with scale lines on a base screen numbered 1-8999, call up a screen with a number above 9000.
- When the sampling period is designated as 1 second or less, depending on the size of the graph display area used, scroll processing can take almost one second, and communication and tag processing can be affected. In this case, setting the sampling period to 2 or more seconds should correct the problem.

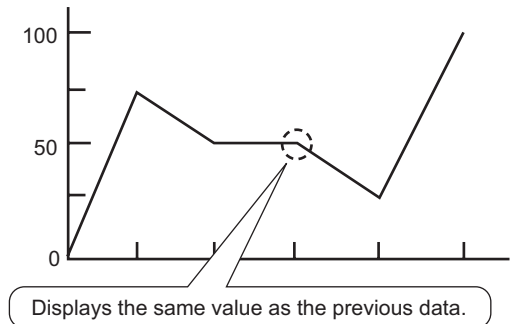
- If there is an error when reading the sampling data, the line display for that portion of the data will not be displayed. If the error continues, that period will not be displayed on the graph. The following sampling data will be displayed on the Historical Trend Graph as follows.

Sampling Data	
1st Sample	0
2nd Sample	75
3rd Sample	50
4th Sample	Readout Error
5th Sample	25
6th Sample	100



- When a Historical Trend Graph's [Data Type] is [BCD], if stored sampling data falls outside the BCD range (other than 0 to 9) by including hexadecimal A to F, the previous sampling data's value will be displayed on the graph. The following sampling data will be displayed on the Historical Trend Graph as follows.

Sampling Data	
1st Sample	0(0h)
2nd Sample	75(75h)
3rd Sample	50(50h)
4th Sample	- (5Fh)
5th Sample	25(25h)
6th Sample	100(100h)



The fourth sample, 95(5Fh) is ignored, and the third sample, 50(32h), is shown in its place on the Graph.

- Please set the Historical Trend Graph's [Data Type] to match the sampling data's bit length. If you set the sampling settings' [Bit Length] to [16 Bit] and the trend graph's [Data Type] to 32 bit, 2 words' data will be combined and handled as 32 bit.

Sampling Data			
Address No.	1	D100	2 words' data is combined and displayed on the graph as 1 data.
	2	D101	
	3	D105	Because there is no address No. 6, that portion is handled as "0".
	4	D200	
	5	D250	

## ■ Restrictions for Display Historical Data

- Only one Historical Trend Graph part with a Display Historical Data function can be placed in total per Base screen.
- You cannot use Display Historical Data Settings on a window screen. Even if you place a Historical Trend Graph set with Display Historical Data Settings on a window screen, the Display Historical Data function will not work.
- When you clear sampling data, in order to erase all sampling data stored in the GP, Historical Data will not be able to be displayed.
- The No. of Data (currently displayed data + historical data) that can be displayed in one channel with Display Historical Data is the amount in [No. of Times] designated in the sampling settings. For the Historical Trend Graph's [Data Samples], please set a number less than [No. of Times] in the sampling settings.
- The number of sampling data that can be saved in the GP depends on the backup SRAM's capacity and the sampling settings. The capacity of backup SRAM varies depending on the main unit model and the uses of the backup SRAM.

☞ "24.9.1 Summary ■ Backup SRAM" (page 24-106)

The table below shows the maximum number of samples when the backup SRAM is used only for backing up the sampling groups used in a line chart.

<The maximum number of samples per No. of Channels>

Backup SRAM Size	1 Channel	10 Channels	20 Channels	30 Channels	40 Channels
320KB (Excluding AGP-3302B)	65535	16265	8132	5421	4065
128KB (AGP-3302B)	64361	6435	3217	2144	1608

<Setting Contents> No. of Sampling Groups: 1, No. of Blocks: 1, Data Type: 16 Bit, Overwrite old data after finishing the specified no. of times, No Date Data, No Data Enabled/Disabled Flags

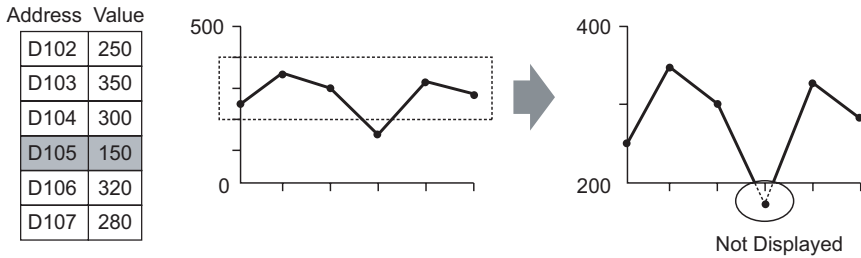
- Switches placed in the Historical Trend Graph will become grouped. You can change an individual Switch's size or attributes, but if you delete the Switch then the Graph will also be deleted simultaneously. It cannot be ungrouped.
- Please do not place switches on a Historical Trend Graph and a Switch Lamp [Special Switch] - [Historical Trend Graph Switch] on the same screen. The switches will not function normally. Only one [Display Historical Data] switch can be set up on a single Historical Trend Graph.
- When using a Switch Lamp [Special Switch] - [Historical Trend Graph Switch] for Display Historical Data, please place the Special Switch and the trend graph with the Display Historical Data function on the same screen. If the Historical Trend Graph is placed on the Base Screen and the Special Switch on the Window Screen, they will not function.
- While in Display Historical Data mode, new samples will not be displayed even if they occur. The display will update when Display Historical Data mode is released. Even while in Display Historical Data mode, data sampling continues.
- Changing screen while in Display Historical Data mode cancels the mode.

### 17.8.3 Data Block Display Graph Restrictions

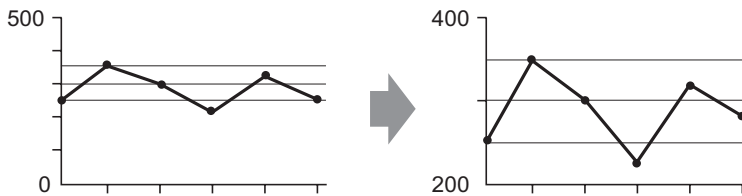
- A total of 8 Data Block Display Graph parts can be displayed at the same time on a single screen. When you are using a window screen, the total number of Data Block Display Graph parts that can be displayed on the base screen and window screen together is 8. When Historical Trend Graphs are also placed on the same screen, the maximum allowed for the two kinds of parts is 8.
- The maximum number of channels (number of lines) that can be displayed on a single Data Block Display Graph is 20.
- The maximum number of channels (number of lines) that can be displayed on a single screen is 40. When you are using a window screen, the total number of channels that can be displayed on the base screen and window screen together is 40. When more than 40 trend graph lines are set up, the 41st and subsequent lines will not function.

#### ■ Restrictions for Show Scale

- Data which is out of the scale's display range will not be shown.



- Show Scale's update timing (the timing of value reading) is the instant when the graph display is cleared or the screen is switched.
- When Show Scale is set, [Alarm Settings] cannot be used.
- When Show Scale is set, [Fill Below Line] cannot be used.
- When auxiliary lines are set, any changes to Show Scale will also affect the horizontal auxiliary lines.



- If a set auxiliary line's value exceeds the graph display range, that auxiliary line is not displayed.
- When auxiliary lines are designated with [Address], the update timing (the timing of value reading) is the instant when the graph display is cleared or the screen is switched.