7.3.1   Location of Settings
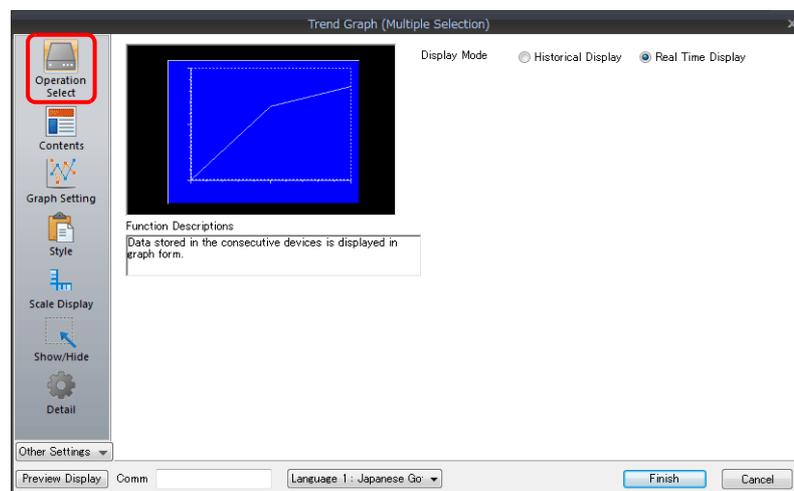
Click [Parts] → [Trend] and place a graph on the screen.

☞   For details on the display method, refer to "7.3.4 Display Method" page 7-43.
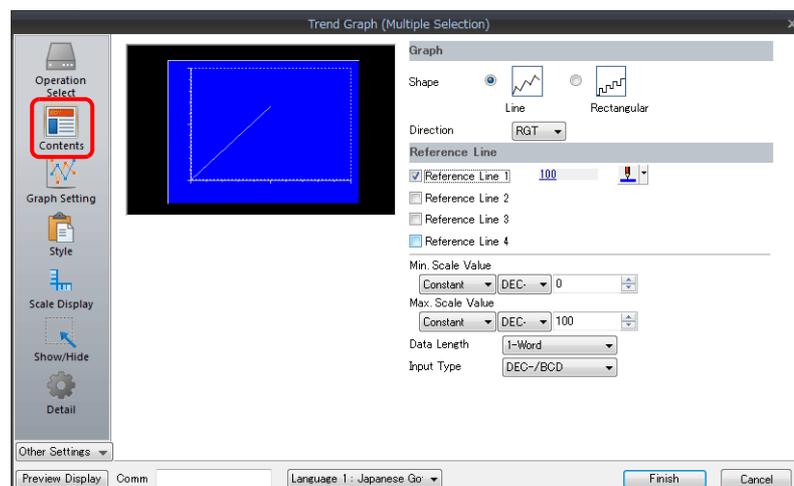
7.3.2   Detailed Settings

Operation Select

Item	Description
Display Mode	Select [Real Time Display].

Contents

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Graph

Item	Description
Shape	Set the graph shape. Line/Rectangular
Direction	Set the direction of graph lines. • RGT (right) • LFT (left) • UP (upward) • DW (downward) X: Time axis Y: Trend data

Reference line

Item	Description
Reference Line	Display a maximum of four horizontal reference lines on a graph. Set the display position and color of each reference line. The line type is fixed to a dotted line. When a device memory address (other than [Constant]) is set, reference lines are updated when the graph is displayed or when a "redraw" or a "redraw after clear" is commanded by the control device memory.

Min. Scale Value
Max. Scale Value
	Set the scale values for calculating the position where the reference line should be drawn in the graph area. Negative values can also be specified.
	
	To draw a reference line in the center of a trend graph:
	
	Reference Line 1
	  - Min. Scale Value: 0
	  - Max. Scale Value: 2
	
	Specifying "1" for reference line 1 will display a line at the center.

Data Length	Set a data length when specifying device memory (other than [Constant]) for reference lines or the minimum and maximum scale values. Set data length for the device memory. 1-Word/2-Word
Input Type	Set the data type of the scale values. DEC-/BCD [*1]/FLOAT [*2]

*1   When [DEC-/BCD] is selected, the setting at [System Setting] → [Hardware Setting] → [PLC Properties] → [Code] takes effect.

*2   If any specified value (non-numeric inclusive) is outside the range usable on the V10/V9 series unit, the line cannot be displayed.
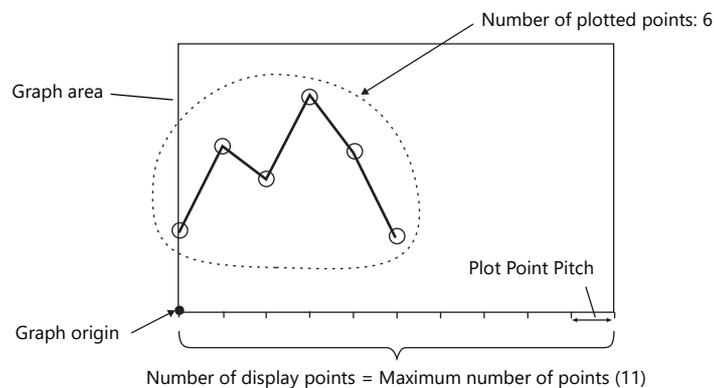
☞   For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

Graph Setting

Item	Description
Points to Display[*1]	Set the number of plot points along the horizontal axis. - For 1024 × 768, 1024 × 600 dots: 3 to 1024 - For 800 × 600, 800 × 480 dots: 3 to 800 - 640 × 480 dots: 3 to 640
Always display	A graph is displayed at all times for the number of points specified by the control device memory. The update timing depends on the [Detail] → [Process Cycle] setting.
Control Device	 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 → 1: Redraw * 0 → 1: Redraw after clear * Points to display * When the [Always display] checkbox is selected, the redraw and redraw after clear bits are invalid. Points to display [*1]: 0 to 1024 Set the number of points to display. The content of the device memory addresses set for numbers 0 to 15 is read for the specified number of points. Redraw [*2] The number of points to display are redrawn. 0 → 1 Drawing is performed over the previous graph without clearing the graph area. The previously displayed image remains. Redraw after clear [*2] The number of points to display are redrawn. 0 → 1 Drawing is performed after clearing the graph area. Only the latest graph is displayed.

Plot Point Pitch	Equal pitch
	    Space all points equally.
	
	Specify the scale range
	    Specify the interval between points using the scale range.
	
	Specify the number of dots
	    Specify the interval between points with the number of dots.
	
	For details, refer to "7.3.3 Plot Point Pitch" page 7-39.

Item		Description
Detailed Settings	Number of Graphs	Set the number of graph lines. Max. 16
	Device	The contents of this device memory address is read and displayed on the graph. The required number of addresses varies depending on the setting for [Points to Display] and [Data Length]. For details, refer to "7.3.3 Plot Point Pitch" page 7-39.
	Use Range	Point pitch: when specified with the number of dots
	Input Format	Set data format of device memory values. DEC- / BCD [*3] / Actual Number [*4] The selection here also applies to minimum, maximum, and X axis scale values.
	Data Length	Select the data length for one plot point. 1-Word/2-Word
	Min. [*5]	Set the graph display area. (PLC device memory [*6] / internal device memory [*6] / constant)
	Max. [*5]	
	Min. Scale [*5]	Set when [Graph Setting] → [Plot Point Pitch] is set to [Specify the scale range]. For details, refer to "7.3.3 Plot Point Pitch" page 7-39.
	Max. Scale [*5]	
	Display Format	Set the graph type (line or marker) and color.
	Type	
	Color	
Item to Display		Change the items displayed in the [Detail Settings] area.

*1   Number of display points

Direction: RGT

Number of plotted points: 6

Graph area

Plot Point Pitch

Graph origin

Number of display points = Maximum number of points (11)

> ⚠️ If a value larger than the X size (dots) of the graph area is specified for [Points to Display], the graph will not be drawn correctly.

*2   "Redraw" and "redraw after clear"

When redrawing, select the "Redraw" or "Redraw after clear" bit.
If the interval between redrawing is too short, the graph may not be redrawn even at the leading edge.
Once displayed, data on the graph cannot be changed unless the redrawing command is given.

*3   When [DEC-/BCD] is selected, the setting for [System Setting] → [Hardware Setting] → [PLC Properties] → [Code] → [DEC/BCD] takes effect.

*4   If any value (non-numeric inclusive) specified is outside the range usable on MONITOUCH, the value cannot be displayed.
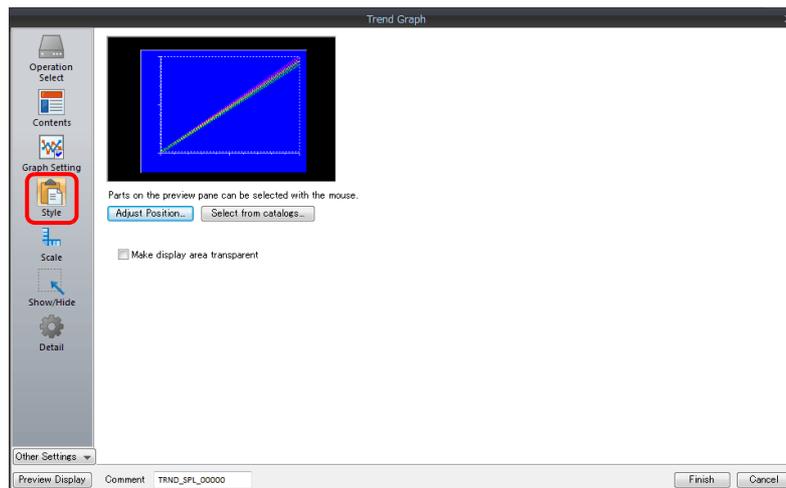
☞   For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

*5   Max., Min., Max. Scale, Min. Scale

Do not specify the same value for both maximum and minimum values. Doing so will result in an error when transferring data to the unit. Make sure to set valid values.
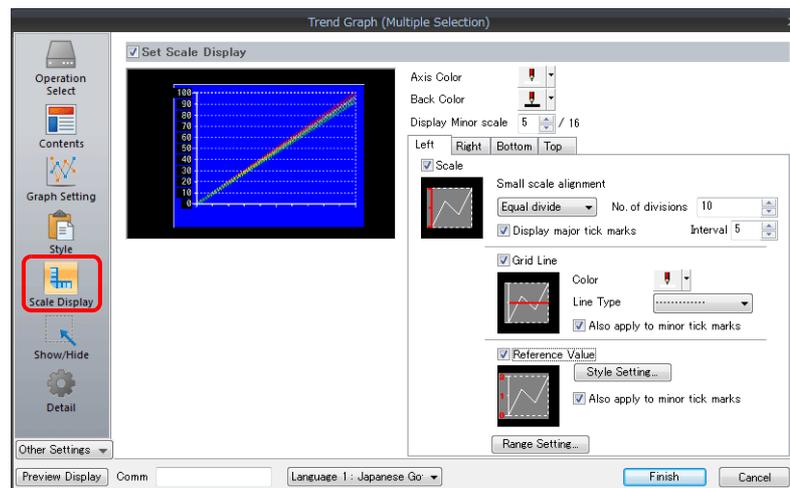
*6   When minimum and maximum values are set with a device memory address (other than [Constant]), these values are updated when the graph is displayed or when a "redraw" or a "redraw after clear" is commanded by the control device memory.

Style

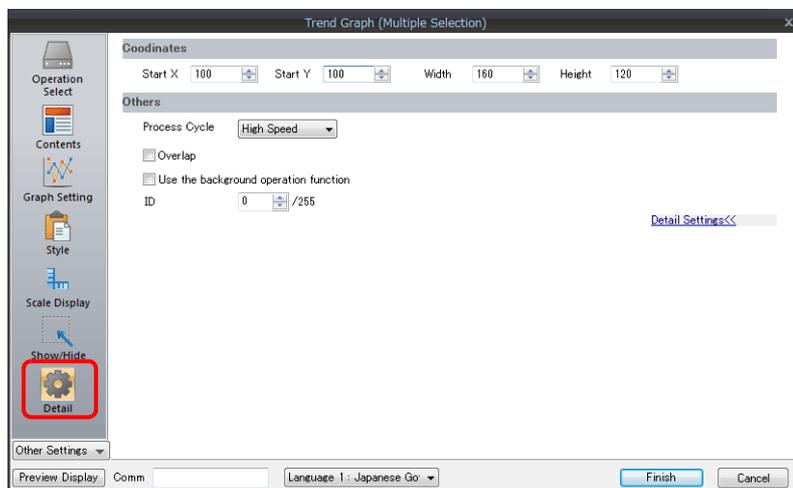| Item	Description
Adjust Position	Adjust the placement position.
Select from catalogs	Change parts.
Make display area transparent	Make the display area transparent.

Scale Display

Item	Description
Axis Color	Select the color of the major and minor tick marks, and axis lines of the scale. This setting is common to all left, right, bottom, and top sides.
Back Color	
Display Minor scale	Set the length of the minor tick marks of the scale. Range: 1 to 16 This setting is common to all left, right, bottom, and top sides. The thickness of the markings is fixed.
[Scale] in [Left], [Right], [Bottom], and [Top] tab windows	Displays the scale, grid line, and reference value settings for each side. Default: Selected on [Left] and [Bottom] tab windows

Small scale alignment	Equal divide (unit based on [No. of divisions])
	    Minor tick marks are equally spaced according to the specified number of divisions along the axis line.
	
	Equal interval (unit based on [Interval])
	    Minor tick marks are equally spaced according to the specified interval from the zero point along the axis line within the following range.

Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of horizontal axis points or scale of [Range Setting]
UP/DW	Left/Right	
LFT/RGT	Left/Right	Scale of [Range Setting]
UP/DW	Top/Bottom	

Item		Description
Display major tick marks		Display major tick marks on the scale. (Unit: [Interval]) Length: Twice the minor tick marks Thickness: Fixed
Grid Line		Grid lines are drawn at the major and minor tick marks of the scale.
	Color, Line Type	Set the color and line type of grid lines.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display grid lines. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Reference Value		Select this checkbox to display reference values at major and minor tick marks on the scale.
	Style Setting	Set the number of digits or the color of reference values shown at tick marks.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display reference values. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Range Setting		Use when [Small scale alignment] is set to [Equal divide] or when the [Reference Value] checkbox is selected. Match with the specified graph The range changes according to the following combinations.

Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of X-axis data points [*1]
UP/DW	Left/Right	
LFT/RGT	Left/Right	Minimum and maximum values specified for the selected graph number [*2]
UP/DW	Top/Bottom	

Set Value
Specify the minimum and maximum values using constants or devices. *2

*1 If [Plot Point Pitch] is set to [Specify the scale range], use the minimum and maximum scale values.

*2 If the minimum and maximum values are specified with device memory addresses (other than [Constant]) in the [Range Setting] window and these values are changed in RUN mode, the changes are updated at the following timings:

- When the screen is redrawn
- The bit for "redraw" or "redraw after clear" in the control device memory is set to ON.

Detail

Item	Description
Coordinates	Set a display position and size.
Process Cycle	Set the cycle used to read the device memory. High Speed, Low Speed, Refresh
Overlap	Select this checkbox to display multiple graphs asynchronously or 17 or more lines in one graph area. For details, refer to "7.3.5 Asynchronous Display of Multiple Trend Graphs" page 7-45.
Use the background operation function [*1]	Update graphs in the background when other screens are displayed. For details, refer to "7.3.6 Background Update" page 7-48.
ID	Set an ID number.

*1 This setting is invalid if the [Always display] checkbox is selected.