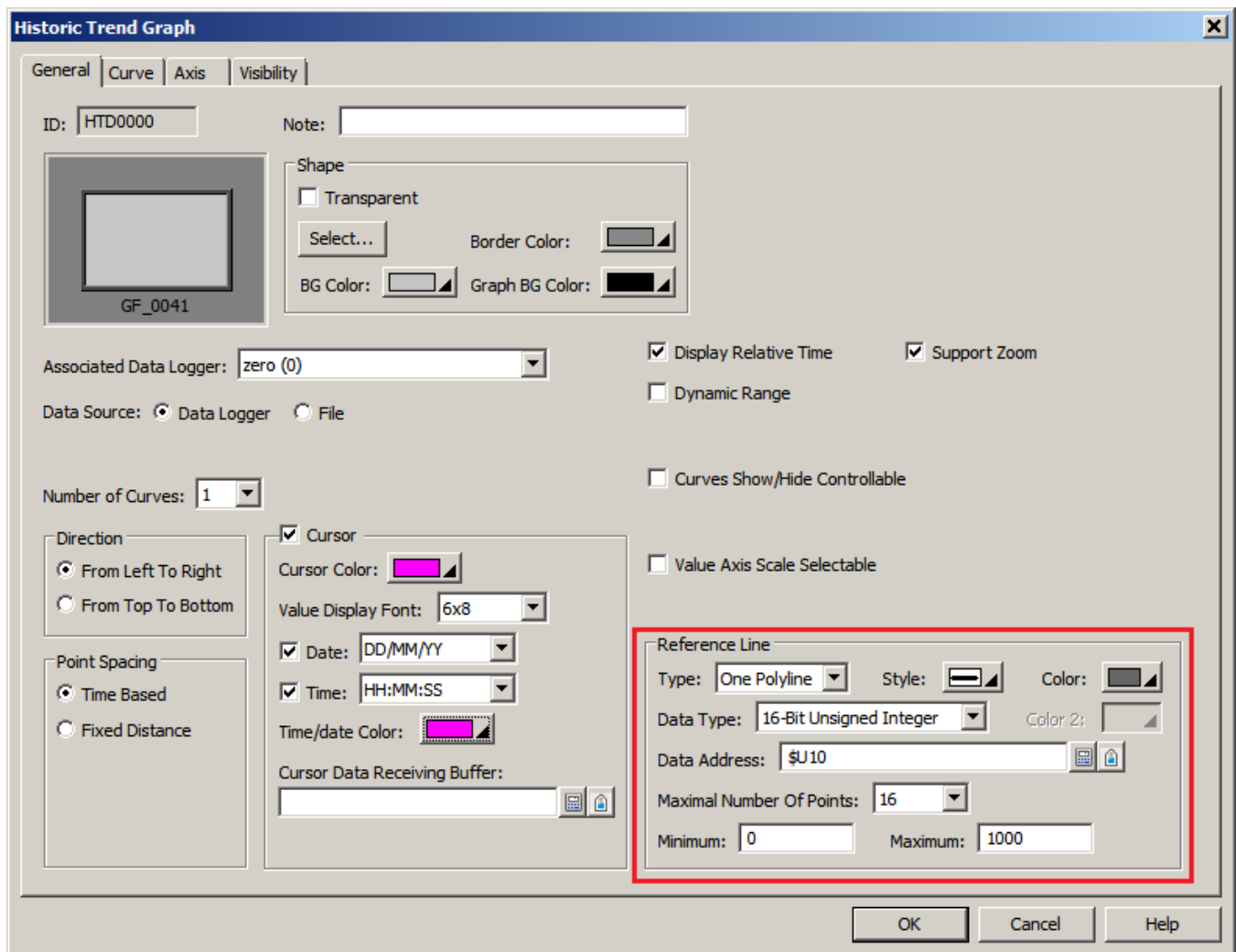
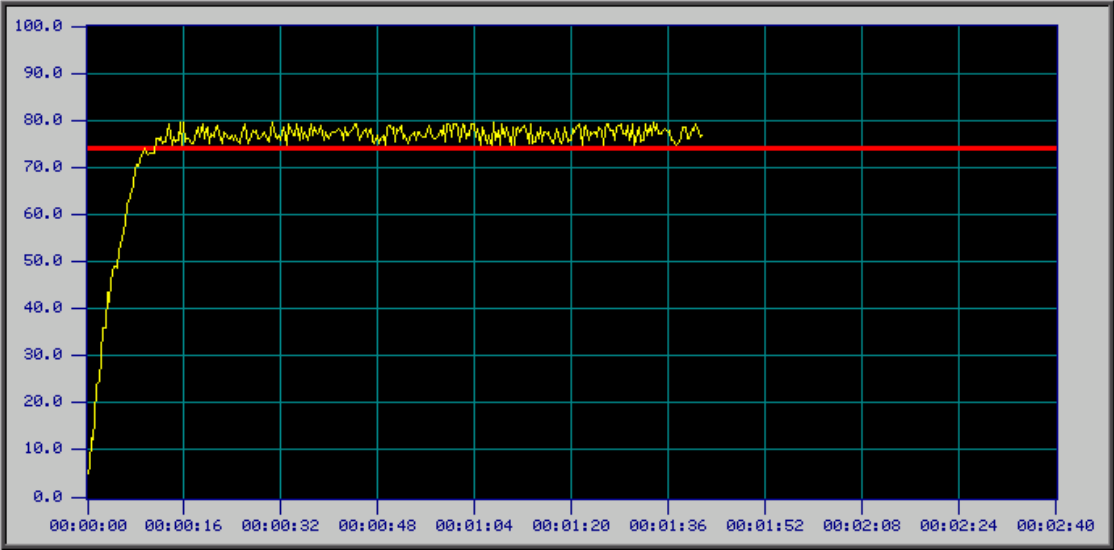
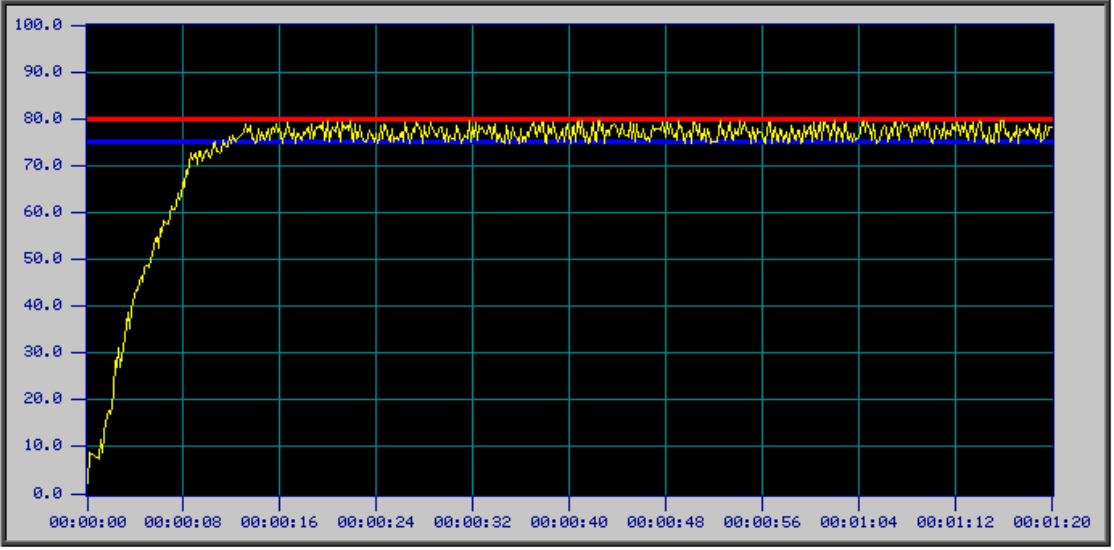


Reference Lines of Historic Trend Graphs

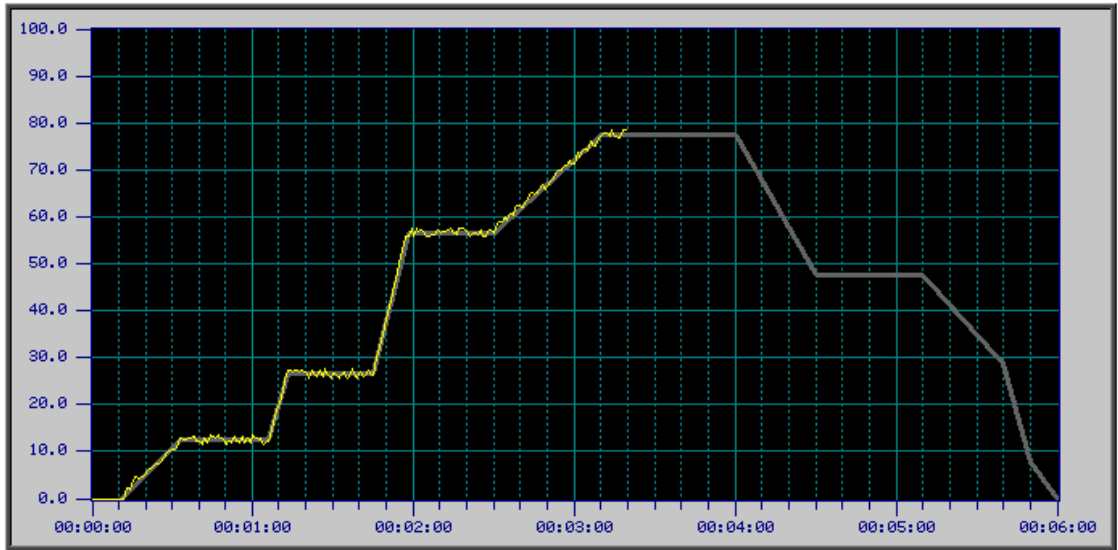
A historic trend graph can display one or two reference lines to help the operator to read the graph efficiently. A reference line can be a horizontal line for the "From Left To Right" trend graphs or a vertical line for the "From Top To Bottom" trend graphs. A reference line can also be a polyline for the trend graphs of any direction. You can control the position of a reference line at run time. If a reference line is a polyline, you can control its shape too. The settings of reference lines are in the Reference Line group of the object's property dialog box as the example shown below.



The following table describes the properties of the reference lines.

Property	Description
Type	The line type and the count of the reference lines. There are three options: One Line, Two Lines, and One Polyline. [Example 1] The following is a historic trend graph with one reference line.  The graph displays a yellow data line on a black background with a green grid. The y-axis ranges from 0.0 to 100.0 in increments of 10.0. The x-axis shows time from 00:00:00 to 00:02:40 in 16-second increments. A single horizontal red reference line is positioned at approximately 75.0. The data line starts at 0.0, rises sharply to about 75.0 by 00:00:16, and then fluctuates around the red line until 00:01:36, after which it continues to fluctuate slightly below the line. [Example 2] The following is a historic trend graph with two reference lines.  The graph displays a yellow data line on a black background with a green grid. The y-axis ranges from 0.0 to 100.0 in increments of 10.0. The x-axis shows time from 00:00:00 to 00:01:20 in 8-second increments. Two horizontal reference lines are present: a blue line at approximately 75.0 and a red line at approximately 80.0. The data line starts at 0.0, rises sharply to about 75.0 by 00:00:08, and then fluctuates around the blue line until 00:00:16, after which it continues to fluctuate around the blue line, staying below the red line.

[Example 3] The following is a historic trend graph with a reference poly-line.

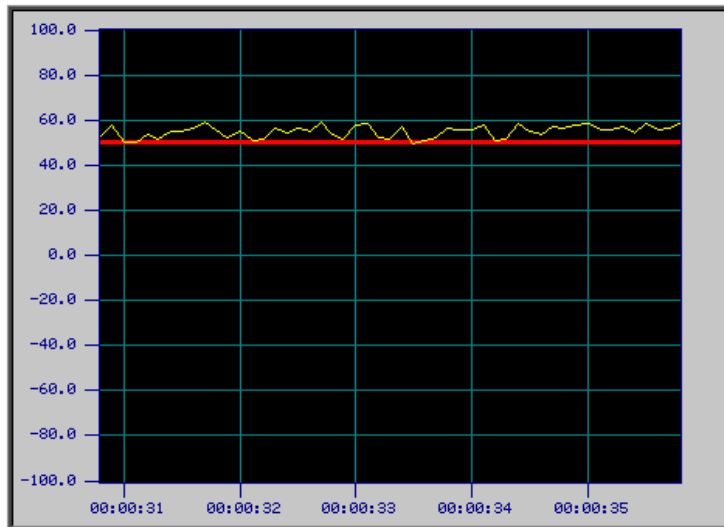


Style	The line style of the reference lines.																
Color	The color of the first reference line.																
Color 2	The color of the second reference line.																
Data Type	The data type of the control data.																
Data Address	The address of the control data. The following tables describe the arrangements of the control data for each reference line type. Type: One Line <table> <tr> <th>Word or Double-word No.</th><th>Description</th></tr> <tr> <td>0</td><td>Specifies the line position. (Note 1)</td></tr> </table> Type: Two Lines <table> <tr> <th>Word or Double-word No.</th><th>Description</th></tr> <tr> <td>0</td><td>Specifies the position of the first line. (Note 1)</td></tr> <tr> <td>1</td><td>Specifies the position of the second line. (Note 1)</td></tr> </table> Type: One Polyline <table> <tr> <th>Word or Double-word No.</th><th>Description</th></tr> <tr> <td>0</td><td>Specifies how many points the polyline has. The value cannot exceed the specified Maximal Number Of Points.</td></tr> <tr> <td>1</td><td>Specifies the distance to shift the polyline rightward if the trend graph is of "From Left To Right" or shift the polyline downward if the trend graph is of "From Top To Bottom". The value must be a</td></tr> </table>	Word or Double-word No.	Description	0	Specifies the line position. (Note 1)	Word or Double-word No.	Description	0	Specifies the position of the first line. (Note 1)	1	Specifies the position of the second line. (Note 1)	Word or Double-word No.	Description	0	Specifies how many points the polyline has. The value cannot exceed the specified Maximal Number Of Points.	1	Specifies the distance to shift the polyline rightward if the trend graph is of "From Left To Right" or shift the polyline downward if the trend graph is of "From Top To Bottom". The value must be a
Word or Double-word No.	Description																
0	Specifies the line position. (Note 1)																
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Word or Double-word No.	Description																
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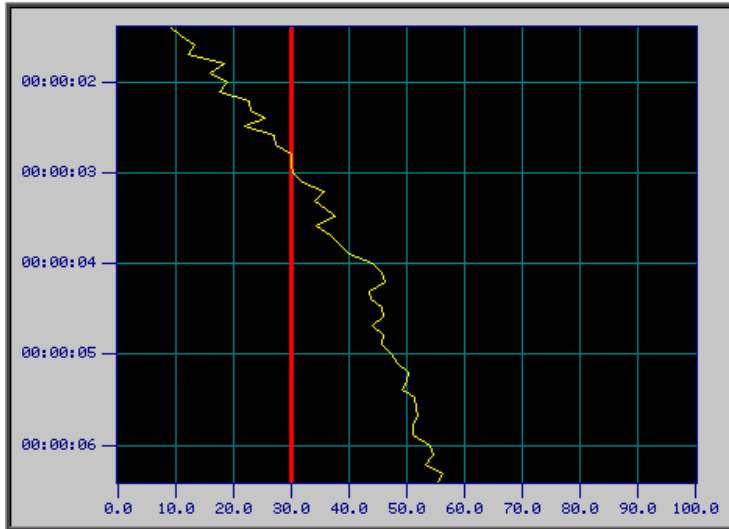
	positive number and the unit is second.
2	Specify the time of the first point relative to the time of the trend graph's origin. The unit is second and the value must be a positive number.
3	Specify the position of the first point in the direction of the data value axis. (Note 1)
4	Specify the time of the second point relative to the time of the trend graph's origin. The unit is second and the value must be greater than the first point's value.
5	Specify the position of the second point in the direction of the data value axis. (Note 1)
...	...
2N	Specify the time of the N-th point relative to the time of the trend graph's origin. The unit is second and the value must be greater than the value of the preceding point.
2N+1	Specify the position of the N-th point in the direction of the data value axis. (Note 1)

Note 1: A valid value is between the specified Minimum and Maximum. When the value equals to the Minimum, it positions the associated reference line or the associated point of the reference polyline at the position corresponding to the minimum of the historic data. When the value equals to the Maximum, it positions the associated line or the point at the position corresponding to the maximum of the historic data. When the value is in between, the associated line or point is at a position in the graph area corresponding to the relation of the value among the Minimum and the Maximum.

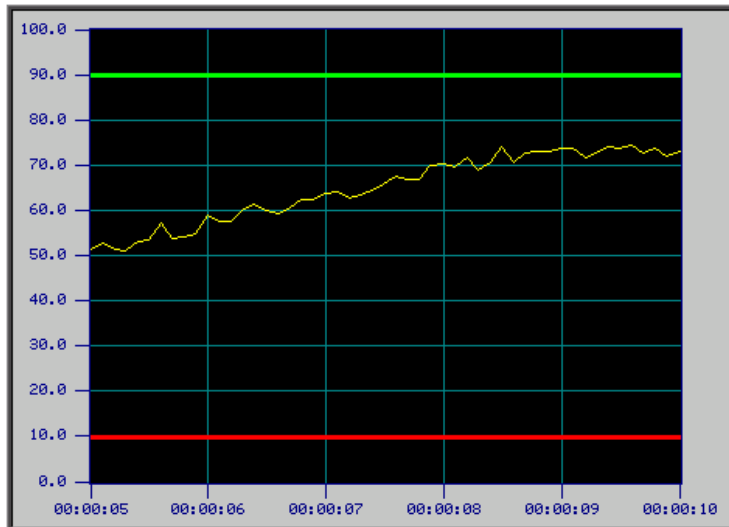
[Example 1] Minimum = -10, Maximum = 10, Control Data = 5



[Example 2] Minimum = 0, Maximum = 100, Control Data = 30



[Example 3] Minimum = 0, Maximum = 100, Control Data 1 = 10, Control Data 2 = 90

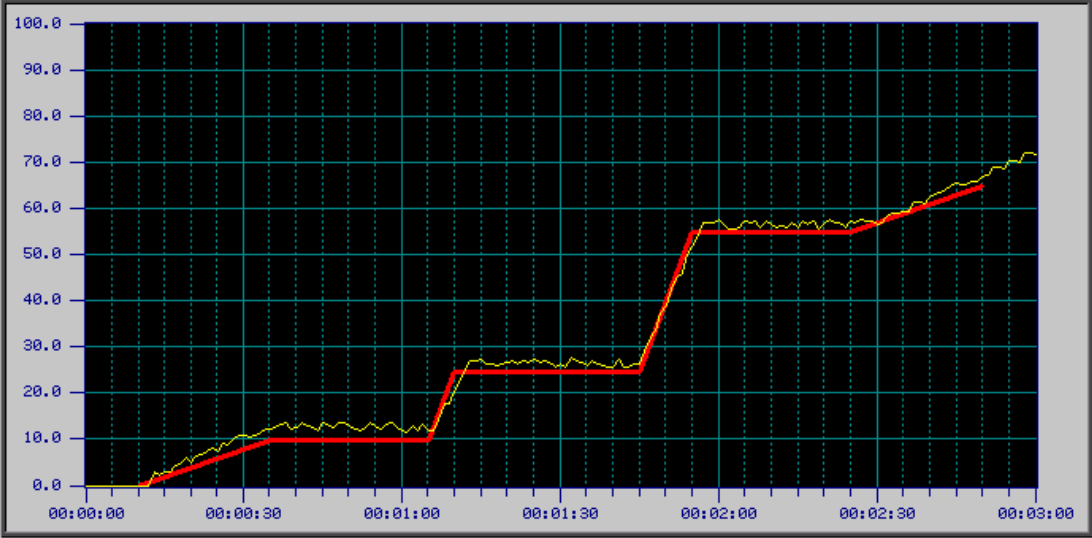


[Example 4] Minimum = 0, Maximum = 100

Control Data:

Word No.	Value	Comment
0	8	Number of points
1	0	No shift
2	10	Time of the 1st point
3	0	Value of the 1st point
4	35	Time of the 2nd point
5	10	Value of the 2nd point
6	65	Time of the 3rd point
7	10	Value of the 3rd point
8	70	Time of the 4th point
9	25	Value of the 4th point

	10	105	Time of the 5th point
	11	25	Value of the 5th point
	12	115	Time of the 6th point
	13	55	Value of the 6th point
	14	145	Time of the 7th point
	15	55	Value of the 7th point
	16	170	Time of the 8th point
	17	65	Value of the 8th point



Time (HH:MM:SS)	Value
00:00:00	0.0
00:00:30	10.0
00:01:00	10.0
00:01:30	25.0
00:02:00	55.0
00:02:30	55.0
00:03:00	70.0

Maximal Number Of Points	The maximal number of points that the reference polyline can have.
Minimum	When the value of the control data equals to the Minimum, it positions the reference lines or the points of the reference polyline at the position corresponds to the minimum of the historic data.
Maximum	When the value of the control data equals to the Maximum, it positions the reference lines or the points of the reference polyline at the position corresponds to the maximum of the historic data.