

# LineGraph-5M

Line and Scatter Plot Graphing Control  
for ASP.NET



**Version 1**  
for Visual Studio .NET

***Desaware, Inc.***

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## **Introduction**

The Desaware, Inc. LineGraph-5M component is designed to allow you to add line and scatter plot graphs to your ASP.NET pages. It can create graphs with an absolute minimum of effort, yet contains enough options to allow you to customize its appearance and function to suit varied needs. Numeric data can be plotted on both axis' and date/time information can be plotted on the X axis. All types of color and style attributes can be changed.

## **Features**

- Easy to use - just supply collections of X and Y points or columns in a DataSet and LineGraph-M will draw a graph.
- Draw line graphs or scatter plot graphs.
- Customize graph colors, fonts, graph appearance, point styles, and many more optional properties.
- Able to use dates and times along the X axis with the display format of the values automatically adjusted according to the time span.
- 100% managed code.

As with all software in Desaware's Five Minute software line, the LineGraph control is easy to learn, use and deploy. Many developers will find the base component sufficient for most tasks, however a source code license is available for those who need additional customization.

## **Installation**

Use the LineGraphSetup.msi or LineGraphSetup11.msi installation package to install the LineGraph-5M package on your system. The installation will display the following installation/registration screen:

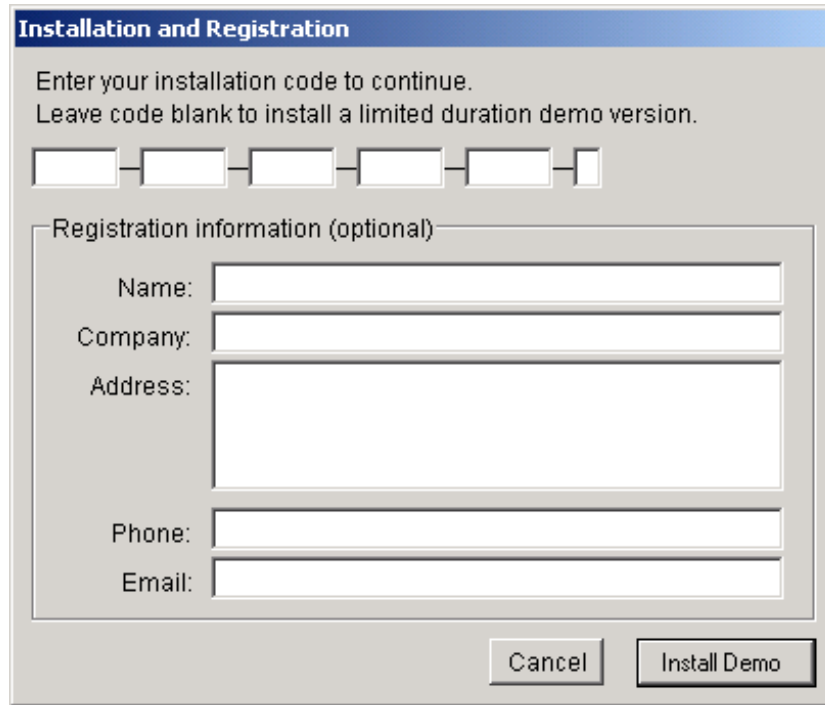
The image shows a Windows-style dialog box titled "Installation and Registration". At the top, it says "Enter your installation code to continue. Leave code blank to install a limited duration demo version." Below this is a row of six small text input boxes for the installation code. Underneath is a section titled "Registration information (optional)" which contains several text input fields: "Name:", "Company:", "Address:" (with a larger text area), "Phone:", and "Email:". At the bottom right of the dialog are two buttons: "Cancel" and "Install Demo".

Figure 1  
Install and Registration Dialog Box

If you do not enter a registration code, the application will be installed with a license valid for 30 days. If a demo version was previously installed and you wish to install a fully licensed copy, please uninstall and then reinstall the product using a valid installation code.

To register online, simply include the specified registration information. This will allow us to notify you about product updates and allow you to obtain free technical support.

## Samples

The LineGraphSample web application demonstrates the majority of the features of the LineGraph control, and includes source code written in VB.NET and C#.

To install the sample application, click on the start menu and select the LineGraphSample installation link. Refer to the *Configuring the LineGraphSample* section of this document or the readme file for information regarding configuring this sample web application.

## Licensing

The installation program will prompt you to enter your license key. If you do not provide a license key, you will be given a 30 day temporary license and the graphic "[www.desaware.com](http://www.desaware.com)" will be appear in the background of the graph.

Once you install the product, the installer will create a license file (LineGraph5M10.dlsc) in the primary product directory.

You can use the LineGraph control by adding a reference to it from any ASP.NET project, or copying it to the executable directory for the application. However, you **MUST** also copy the LineGraph5M10.dlsc file for the system into that directory as well

in addition to several dependent files - Desaware.MachineLicense.dll and Desaware.Dls.Interfaces.dll.

The LineGraph control is licensed for each machine. Once licensed on a system, you can use the control on as many ASP.NET applications as you wish on that system.



## Using LineGraph-5M Into Your ASPX Assembly

To add graphing ability to your ASPX assembly, first add the LineGraph control to the ToolBox. Display the ToolBox, right click on the ToolBox window, and select “Customize Toolbox...” from the menu. This will display the “Customize Toolbox” dialog box. Select the “.NET Framework Components” tab, press “Browse” and locate the location of the Desaware.LineGraph.dll file. Press OK. You will now have an entry for LineGraph in the Web Forms section of the ToolBox (usually at the bottom).

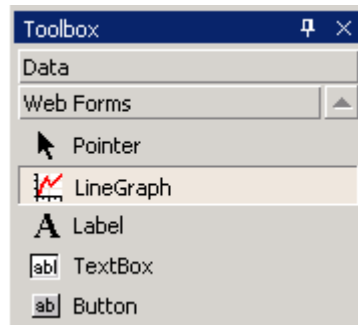


Figure 2  
**Toolbox Menu**

You can select the LineGraph entry from the Toolbox menu and drop it on your ASPX page.

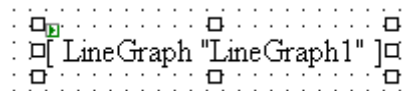


Figure 3  
**LineGraph Graphic**

The LineGraph control generates images – it does not display them. To display an image, you must use the ReturnImage.aspx page to generate a link to the image. First ensure ReturnImage.aspx is part of your project. Then set the appropriate graph parameters. Call the CreateGraphSessionVariable() method, passing a unique name as the parameter. The control will then save the resulting image in a session variable with that name. To use the image, pass the name as the single parameter to the ReturnImage.aspx page, which will return a URL to the image.

### [VB]

```
LineGraph5m1.CreateGraphSessionVariable("linegraph1")  
' Image1 is a Image Web Control  
Image1.ImageUrl = "ReturnImage.aspx?Name=linegraph1"
```

**[C#]**

```
LineGraph5m1.CreateGraphSessionVariable("linegraph1");  
// Image1 is a Image Web Control  
Image1.ImageUrl = "ReturnImage.aspx?Name=linegraph1";
```

## Quick Start

If you have an array of X values and an array of Y values, you can create a graph.

Set the **ImageHeight** and **ImageWidth** properties (*see the following code example*), and call the **AddPointSet()** method with both arrays, and the component will create the graph. Call **CreateGraphFile()** to create a graph file or **CreateImage()** to draw a graph into a session variable which can be then accessed by ASPX pages.

### [VB]

```
Imports Desaware.LineGraph

' This line is generated for you when you place the control on
' the aspx page.
Dim LineGraph5M1 As New LineGraph()

Dim x As New ArrayList()
Dim y As New ArrayList()

LineGraph5m1.ImageHeight = 120
LineGraph5m1.ImageWidth = 220
x.Add(10)
x.Add(20)
x.Add(35.6)
y.Add(-5)
y.Add(4.84)
y.Add(7)
LineGraph5M1.AddPointSet(x, y)
LineGraph5M1.CreateGraphFile(Page.MapPath(".") + "\graph.gif")
```

### [C#]

```
using Desaware.LineGraph;

// This line is generated for you when you place the control on
// the aspx page.
LineGraph LineGraph5M1 = new LineGraph();

ArrayList x = new ArrayList();
ArrayList y = new ArrayList();

LineGraph5M1.ImageHeight = 120;
```

```
LineGraph5M1.ImageWidth = 220;  
x.Add(10);  
x.Add(20);  
x.Add(35.6);  
y.Add(-5);  
y.Add(4.84);  
y.Add(7);  
LineGraph5M1.AddPointSet(x, y);  
LineGraph5M1.CreateGraphFile(Page.MapPath(".") + "\\graph.gif");
```

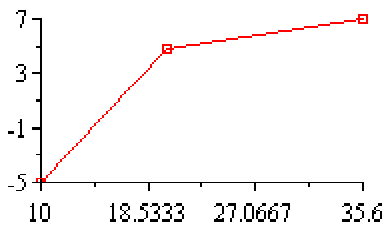


Figure 4  
Results of Input (as a Graph)

To create a graph with no points, set the **ImageHeight** and **ImageWidth** properties, then set the **HigherXBound**, **LowerXBound**, **HigherYBound** and **LowerYBound** properties (*see the following code example*), and finally call the appropriate **CreateGraph()** / **CreateGraphFile()** / **CreateGraphBitmap()** method.

#### [VB]

```
LineGraph5m1.UseAutoSize = False
LineGraph5m1.ImageHeight = 120
LineGraph5m1.ImageWidth = 220
LineGraph5m1.HigherXBound = 100
LineGraph5m1.LowerXBound = 0
LineGraph5m1.HigherYBound = 100
LineGraph5m1.LowerYBound = 0
LineGraph5m1.CreateGraphFile("graph.gif")
```

#### [C#]

```
LineGraph5m1.UseAutoSize = false;
LineGraph5m1.ImageHeight = 120;
LineGraph5m1.ImageWidth = 220;
LineGraph5m1.HigherXBound = 100;
LineGraph5m1.LowerXBound = 0;
LineGraph5m1.HigherYBound = 100;
LineGraph5m1.LowerYBound = 0;
LineGraph5m1.CreateGraphFile("graph.gif");
```

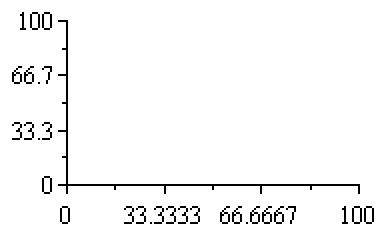


Figure 5  
Results of Input (as a Graph)

Refer to the [LineGraphSample](#) web project for additional samples demonstrating the LineGraph control.

## **Configuring the LineGraphSample Project**

The LineGraphSample project demonstrates the majority of the features of the LineGraph control.

We gave some thought into whether to completely automate the installation, but decided it would be a better experience to actually require you to build and explicitly configure the web application.

If you wish to automate the installation/configuration of web application databases that you deploy, check out our InstallationHelper-5M product at <http://www.5Minute-Software.com>.

### ***Demo Installation***

To install and configure the LineGraphSample project, do the following:

1. Be sure your ASP.Net compatible web server is running.
2. Using the Program/Start menu, install the LineGraphSample.msi installer file.
3. After installation is completed, copy the LineGraph license file (LineGraph5M10.dlsc) from your LineGraph “bin” folder to the location of the bin folder of the new web application.
4. Open the project file. Typically <http://localhost/LineGraphSample/LineGraphSample.vbproj>.
5. You should now be able to run the application. Set the default page if prompted to WebForm1.aspx.

## LineGraph-5M Reference

The following is detailed reference information for the Desaware LineGraph class. Properties and methods of base classes are not listed unless they are overridden.

**Note on thread safety:** Unless otherwise noted, as is common in the .NET Framework, static methods of objects are thread safe. Instance methods are not.

### Enum PointStyles

A list of symbols to be drawn at each point. The possible values are:

Symbol	Value
Empty	null value, no point drawn
None	no point drawn
SinglePixel	single pixel is drawn
Plus	plus sign
Circle	hollow circle
Diamond	hollow diamond
Square	hollow square
Pyramid	hollow triangle with point up
Triangle	hollow triangle with point down
CircleF	filled circle
DiamondF	filled diamond
SquareF	filled square
PyramidF	filled triangle with point up
TriangleF	filled triangle with point down

### Enum PointSizes

Size of **PointStyles** symbols (except *SinglePixel*, which is always a single pixel).

Small  
Medium  
Large

### Enum GraphTypes

This is the type of graph to draw. *ScatterPlot* only draws the point symbols, while *Line* draws point symbols and connecting lines.

ScatterPlot  
Line

## Enum GridTypes

This is the type of grid drawn on the graph. Grid lines are light gray and are drawn from the location of each major tick.

- None
- Vertical
- Horizontal
- Both

## Enum ImageFormats

The file format of the graph, used in both **CreateGraph()** and **CreateGraphFile()** methods. The *PNG* format usually results in a better image, but not all browsers support that format. *GIF* is better supported, but the drawing routines will often be dithered unless only the most basic colors are used. *JPEG* format is not supported by the *LineGraph* control as .NET support for that format results in unacceptably blurry lines and text.

- GIF
- PNG

## Properties

ImageWidth	<pre>[VB] Property ImageWidth As Integer [C#] int ImageWidth</pre> <p>Represents the size, in pixels, of the image created by the component. This must be set before a graph can be drawn. If the number is too small, an unsatisfactory image may result. Values below 50 will generate an exception.</p>
ImageHeight	<pre>[VB] Property ImageHeight As Integer [C#] int ImageHeight</pre> <p>Represents the size, in pixels, of the image created by the component. This must be set before a graph can be drawn. If the number is too small, an unsatisfactory image may result. Values below 50 will generate an exception.</p>
ImageFormat	<pre>[VB] Property ImageFormat As ImageFormats [C#] ImageFormats ImageHeight</pre> <p>Instance of the <b>ImageFormats</b> enumeration. Describes the file format of the image created by the component. This impacts both <b>CreateGraph()</b> and <b>CreateGraphFile()</b> methods. See the <b>ImageFormats</b> enumeration for detailed information. PNG</p>



format supports more colors, but is not supported by all web browsers. GIF files are supported by all browsers, but colors can be dithered (that is, comprised of pixels of different basic colors) and may look muddy. To prevent dithering in GIF images, use basic colors (Red or Green instead of Salmon or Forest). By default images are in GIF format.

```
LineGraph5M1.ImageFormat =  
LineGraph.ImageFormats.PNG
```

## GraphType

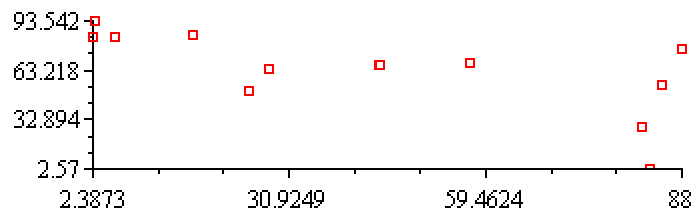
[VB] Property GraphType As GraphTypes

[C#] GraphTypes GraphType

Instance of the **GraphTypes** enumeration. Describes the type of graph being drawn, either line graph (lines connect each point symbol) or scatter plot graph (where only point symbols are drawn). The default value is LineGraph. See the **GraphTypes** enumeration for more information.

To draw lines without point symbols, set the Point parameter to None when you call the **AddPointSet** method, or use the **Sets** property to change the symbol to None after the set has been added.

```
LineGraph5M1.GraphType =  
LineGraph.GraphTypes.ScatterPlot
```

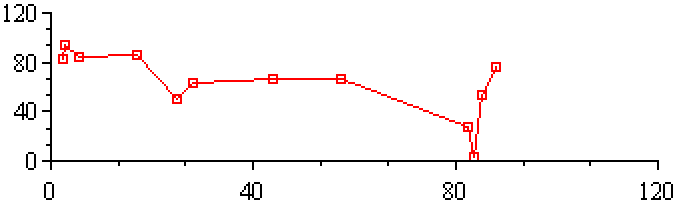


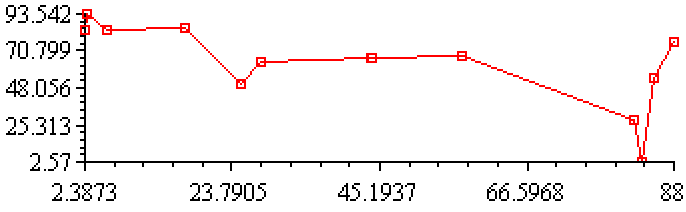
## HigherXBound

[VB] Property HigherXBound As Object

[C#] object HigherXBound

Only numeric types (integers and floating point) and the DateTime type are accepted. This is the highest boundary of the X axis of the graph. If the **UseAutoSize** property is set to True, then this value can only be read and not modified. If sets of points are added after this property is set, the property may be adjusted automatically to fit the new points.

<b>HigherYBound</b>	<p>[VB] Property HigherYBound As Double [C#] double HigherYBound</p> <p>This is the higher bound of the Y axis of the graph. If the <b>UseAutoSize</b> property is set to True, then this value can only be read and not modified.</p>
<b>LowerXBound</b>	<p>[VB] Property LowerXBound As Object [C#] object LowerXBound</p> <p>Only numeric types (integers and floating point) and the DateTime type are accepted. This is the lower boundary of the X axis of the graph. If the <b>UseAutoSize</b> property is set to True, then this value can only be read and not modified. If sets of points are added after this property is set, the property may be adjusted automatically to fit the new points.</p>
<b>LowerYBound</b>	<p>[VB] Property LowerYBound As Double [C#] double LowerYBound</p> <p>This is the lower bound of the Y axis of the graph. If the <b>UseAutoSize</b> property is set to True, then this value can only be read, and attempts to change it will not have an effect. If sets of points are added after this property is set, the property may be adjusted automatically to fit the new points.</p> <pre>LineGraph5M1.LowerXBound = 0 LineGraph5M1.HigherXBound = 120 LineGraph5M1.LowerYBound = 0 LineGraph5M1.HigherYBound = 120</pre> 

<p>MajorTicksXAxis</p>	<p>[VB] Property MajorTicksXAxis As Integer [C#] int MajorTicksXAxis</p> <p>This is the number of large ticks on the X axis of the graph. The large ticks are labeled, if there is room for the label. Grids are drawn from each major tick. This value is always at least 2. It is set to 4 by default.</p>
<p>MajorTicksYAxis</p>	<p>[VB] Property MajorTicksYAxis As Integer [C#] int MajorTicksYAxis</p> <p>This is the number of large ticks on the Y axis of the graph. The large ticks are labeled, if there is room for the label. Grids are drawn from each major tick. This value is always at least 2. It is set to 4 by default.</p>
<p>MinorTicksXAxis</p>	<p>[VB] Property MinorTicksXAxis As Integer [C#] int MinorTicksXAxis</p> <p>This is the number of small ticks <i>between</i> each major tick on the X axis of the graph. Has a value of 1 by default. Setting this to zero would remove minor ticks from the X axis.</p>
<p>MinorTicksYAxis</p>	<p>[VB] Property MinorTicksYAxis As Integer [C#] int MinorTicksYAxis</p> <p>This is the number of small ticks <i>between</i> each major tick on the Y axis of the graph. Has a value of 1 by default. Setting this to zero would remove minor ticks from the Y axis.</p> <pre>LineGraph5M1.MajorTicksXAxis = 5 LineGraph5M1.MajorTicksYAxis = 5 LineGraph5M1.MinorTicksXAxis = 4 LineGraph5M1.MinorTicksYAxis = 4</pre> 

## Sets

```
[VB] Dim Sets As SetType()  
[C#] SetType[] Sets
```

Array of structures describing each set of points. Properties of the structure are:

**LineColor** As Color - color of lines in line graphs.

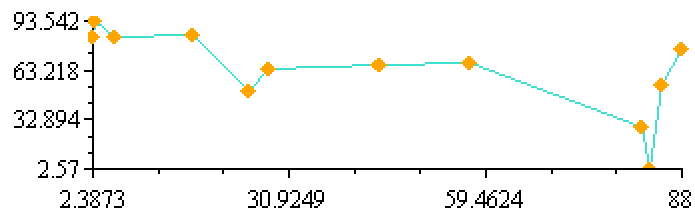
**PointColor** As Color - color of points when points are drawn.

**PointStyle** As PointStyles - type of point to draw.

Once a set of points is added to the graph, you can use this array to modify its properties.

```
[VB]  
LineGraph5M1.Sets(0).LineColor = Color.Turquoise  
LineGraph5M1.Sets(0).PointColor = Color.Orange  
LineGraph5M1.Sets(0).PointStyle = LineGraph.  
PointStyles.DiamondF
```

```
[C#]  
LineGraph5M1.Sets[0].LineColor = Color.Turquoise;  
LineGraph5M1.Sets[0].PointColor = Color.Orange;  
LineGraph5M1.Sets[0].PointStyle = LineGraph.  
PointStyles.DiamondF;
```



## NumSets

```
[VB] ReadOnly Property NumSets As Integer  
[C#] int NumSets [get]
```

Returns the number of line sets the component currently holds.

```
[VB]  
' Make all lines on the graph black.
```

```

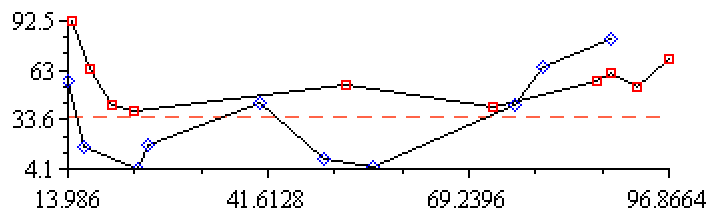
Dim i As Integer
For i = 0 to LineGraph5M1.NumSets - 1
    LineGraph5M1.Sets(i).LineColor = Color.Black
Next I

```

```

[C#]
// Make all lines on the graph black.
int i;
for (i = 0; I < LineGraph5M1.NumSets; i++)
    LineGraph5M1.Sets[i].LineColor = Color.Black;

```



**PointSize**

```

[VB] Property PointSize As PointSizes
[C#] PointSizes PointSize

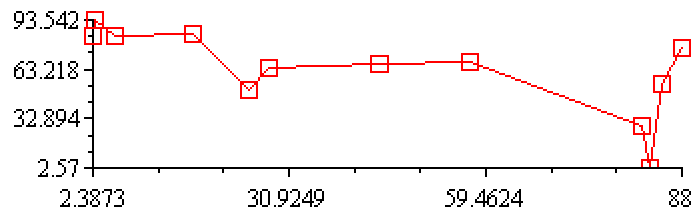
```

Expresses the size of the point symbols drawn (except for the "single point" style). See the PointSizes enumeration for more information. By default the size is "small".

```

LineGraph5M1.PointSize = LineGraph.PointSizes.Large

```



**TitleCaption**

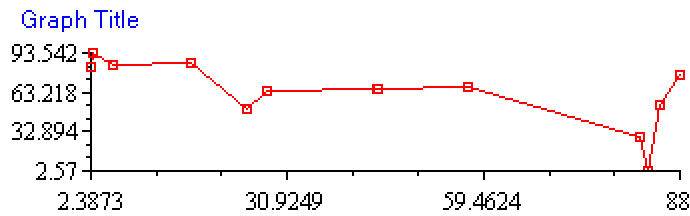
```

[VB] Property TitleCaption As String
[C#] string TitleCaption

```

Text that is displayed on the top left corner of the graph. Its color is set by the **CaptionColor** property and its font is set by the **Font** property. By default no title is shown, and the graph is expanded to fill the space.

```
LineGraph5M1.TitleCaption = "Graph Title"
```

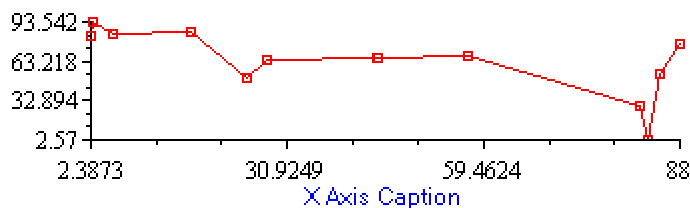


#### XAxisCaption

```
[VB] Property XAxisCaption As String  
[C#] string XAxisCaption
```

Text that is displayed along the X axis (bottom of the graph). Its color is set by the **CaptionColor** property and its font is set by the **Font** property. By default no caption is shown, and the graph is expanded to fill the space.

```
LineGraph5M1.XAxisCaption = "X Axis Caption"
```

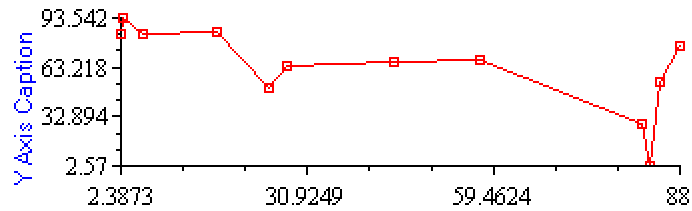


#### YAxisCaption

```
[VB] Property YAxisCaption As String  
[C#] string YAxisCaption
```

Text that is displayed along the Y axis (left of the graph). It is displayed vertically. Its color is set by the **CaptionColor** property and its font is set by the **Font** property. By default no caption is shown, and the graph is expanded to fill the space.

```
LineGraph5M1.YAxisCaption = "Y Axis Caption"
```



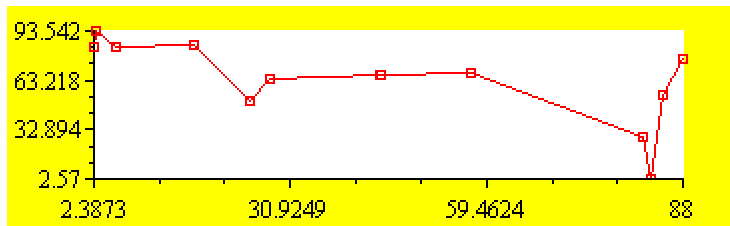
### BackColor

```
[VB] Property BackColor As Color
```

```
[C#] Color BackColor
```

Background color of the image. By default it is set to Color.White (255,255,255 RGB).

```
LineGraph5M1.BackColor = Color.Yellow
```



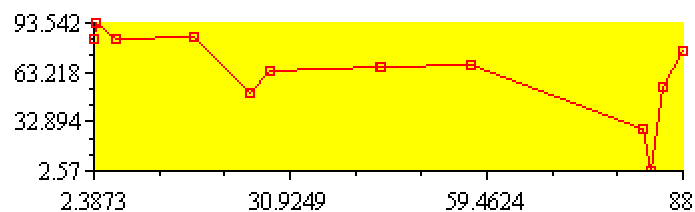
### ForeColor

```
[VB] Property ForeColor As Color
```

```
[C#] Color ForeColor
```

Color of the area contained within the graph bounds. By default it is set to Color.White (255,255,255 RGB).

```
LineGraph5M1.ForeColor = Color.Yellow
```

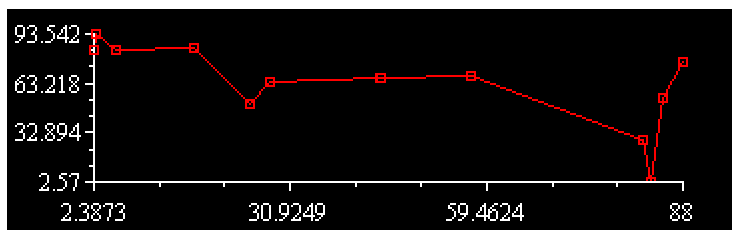


## AxisColor

```
[VB] Property AxisColor As Color  
[C#] Color AxisColor
```

Color of the axis and the text at the tick marks. By default it is Color.Black (0,0,0 RGB).

```
LineGraph5M1.BackColor = Color.Black  
LineGraph5M1.GraphBackColor = Color.Black  
LineGraph5M1.AxisColor = Color.White
```

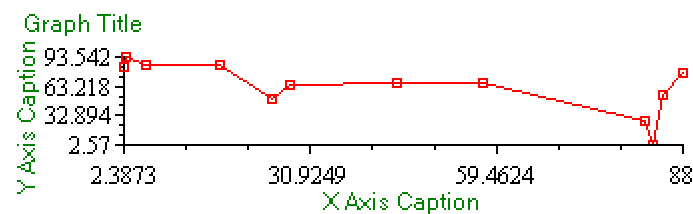


## CaptionColor

```
[VB] Property CaptionColor As Color  
[C#] Color CaptionColor
```

Color of **XAxisCaption**, **YAxisCaption**, and **TitleCaption**. By default it is set to Color.Blue (0,0,255 RGB).

```
LineGraph5M1.CaptionColor = Color.Green
```



## IndicatorColor

```
[VB] Property IndicatorColor As Color  
[C#] Color IndicatorColor
```

Color of the dashed lines added by **AddIndicationLine()** and areas added by **AddIndicationArea()** methods. By default this property is set to Color.Tomato (RGB 255, 99,71).

```
[VB]
```



```

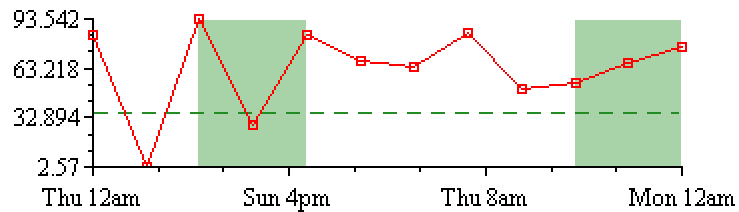
LineGraph5M1.AddIndicatorLine(35.5)
' Mark the weekends
LineGraph5M1.AddIndicatorArea(New
DateTime(2003,5,3), New DateTime(2003,5,5))
LineGraph5M1.AddIndicatorArea(New
DateTime(2003,5,10), New DateTime(2003,5,12))
LineGraph5M1.IndicatorColor = Color.ForestGreen

```

```

[C#]
LineGraph1.AddIndicatorLine(35.5);
// Mark the weekends
LineGraph1.AddIndicatorArea(new DateTime(2003,5,3),
new DateTime(2003,5,5));
LineGraph1.AddIndicatorArea(new
DateTime(2003,5,10), new DateTime(2003,5,12));
LineGraph1.IndicatorColor = Color.ForestGreen;

```



## UseGrid

```

[VB] Property UseGrid As GridTypes
[C#] GridTypes UseGrid

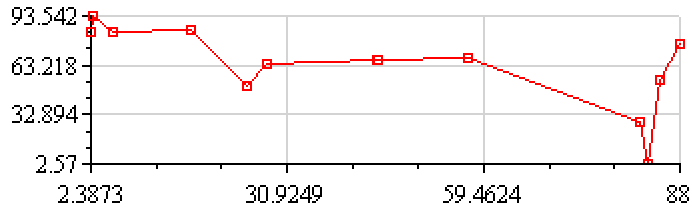
```

Describes the type of grid lines drawn on the graph. The grid is a series of light grey lines drawn along the major tick marks, either vertically, horizontally, or both. See the Grid enumeration for detailed information. By default, no grid is drawn.

```

LineGraph5M1.UseGrid = LineGraph.GridTypes.Both

```

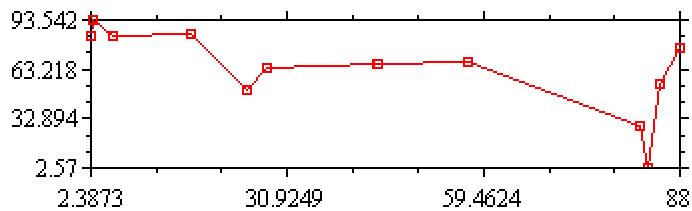


### UseBoxAxis

[VB] Property UseBoxAxis As Boolean  
 [C#] bool UseBoxAxis

If set to True, the axis and tick marks are drawn on all sides. Set to False by default.

LineGraph5M1.UseBoxAxis = True



### UseProportionalFont

[VB] Property UseProportionalFont As Boolean  
 [C#] bool UseProportionalFont

If set to True, the font size of XAxisCaption, YAxisCaption, and TitleCaption will change depending on the size of the graph image. Set to False by default.

### UseAutoSize

[VB] Property UseAutoSize As Boolean  
 [C#] bool UseAutoSize

If set to True, then the graph limits are set to perfectly match the points of all the sets and the LowerXBound, LowerYBound, HigherXBound, HigherYBound properties are ignored. If set to False, then LowerXBound, LowerYBound, HigherXBound, HigherYBound must be set. The higher bounds must be larger than the lower bounds or the graph will not be drawn. Set to True by default.

UsesDateXAxis

```
[VB] ReadOnly Property UsesDateXAxis As Boolean  
[C#] bool UsesDateXAxis [get]
```

Read only Boolean. If set to True, then the graph is using DateTime types on the X axis instead of numeric values. The graph determines this by checking the type of the first point given it - from that point onwards, it ignores data that does not correspond to that type.

## Methods

AddPointSet

```
[VB] Sub AddPointSet  
(ByVal X As ICollection, ByVal Y As ICollection)  
(ByVal X As ICollection, ByVal Y As ICollection, ByVal  
SetColor As Color)  
(ByVal X As ICollection, ByVal Y As ICollection, ByVal  
SetColor As Color, ByVal PointStyle As PointStyles)  
(ByVal X As ICollection, ByVal Y As ICollection, ByVal  
LineColor As Color, ByVal PointColor As Color)  
(ByVal X As ICollection, ByVal Y As ICollection, ByVal  
LineColor As Color, ByVal PointColor As Color, ByVal  
PointStyle As PointStyles)  
  
[C#] void AddPointSet  
(ICollection X, ICollection Y)  
(ICollection X, ICollection Y, Color SetColor)  
(ICollection X, ICollection Y, Color SetColor,  
PointStyles PointStyle)  
(ICollection X, ICollection Y, Color LineColor, Color  
PointColor)  
(ICollection X, ICollection Y, Color LineColor, Color  
PointColor, PointStyles PointStyle)
```

Adds a set of points to the graph. The *X* and *Y* parameters can be of any type that supports the ICollection interface, such as Collections, Arrays, ArrayLists and many other types.

The *X* collection must be a collection of numeric types (integer or floating point numbers) or DateTime items. The *Y* collection must be a collection of numeric types. Any item in either collection that does not correspond to this limitation will not be added to the points on the graph. The first item in the first point set added determines the type of the X axis (either a number or a date) – any *x* value that does not correspond to the selected type will also cause the pair to

	<p>be ignored.</p> <p>Overrides allow you to specify the color and point styles of the points and/or lines. <i>SetColor</i> is the color of both the line and the point symbols. If no color or point style is specified, unique ones will automatically be set.</p> <pre>[VB] Dim x As New ArrayList() Dim y As New ArrayList()  x.Add(10) x.Add(20) x.Add(35.6) y.Add(-5) y.Add(4.84) y.Add(7) LineGraph5M1.AddPointSet(x, y, Color.Green, _     LineGraph.LineStyle.None)</pre> <pre>[C#] ArrayList x = new ArrayList(); ArrayList y = new ArrayList();  x.Add(10); x.Add(20); x.Add(35.6); y.Add(-5); y.Add(4.84); y.Add(7); LineGraph5M1.AddPointSet(x, y, Color.Green, _     LineGraph.LineStyle.None);</pre>
<p><b>DataBind</b></p>	<pre>[VB] Sub DataBind() [C#] void DataBind()</pre> <p>The LineGraph5m component can accept data from DataSets as well as collections. To do this, first the <b>DataSource</b> property is set</p>

to the DataSet where the data will originate. The **DataMember** property is set to the text name of the particular Table in which the data resides. The **DataFieldX** and **DataFieldY** properties are then set to the string name of the columns where the X and Y positions of the points are located. Once the properties are correctly set, call the **DataBind()** method to add the point set. You cannot change the attributes of a set when it is added - after it is loaded you can use the **Sets** property as needed.

XML file is formatted as follows:

```
<XMLSchema1 xmlns="http://tempuri.org/XMLSchema1.xsd">
<Position xmlns="http://tempuri.org/XMLSchema1.xsd">
    <X>5.63</X>
    <Y>84.27</Y>
    <Date>2003-05-01T00:00:00.0000000-07:00</Date>
</Position>
```

and so on

[VB]

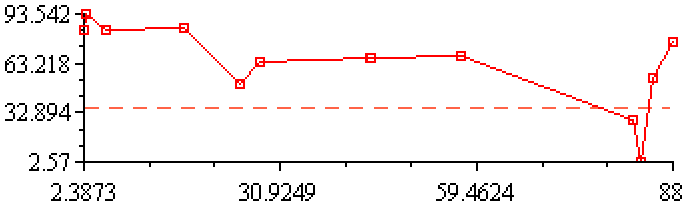
```
Dim ds as New DataSet()
ds.ReadXml("XMLFile1.xml")
LineGraph5M1.DataSource = ds
LineGraph5M1.DataMember = "Position"
If (UsingDates = True) Then
    LineGraph5M1.DataFieldX = "X"
Else
    LineGraph5M1.DataFieldX = "Date"
End If
LineGraph5M1.DataFieldY = "Y"
LineGraph5M1.DataBind()
' Don't draw point symbols with this line.
LineGraph5M1.Sets(LineGraph5m1.NumSets - 1).PointStyle
= LineGraph.PointStyles.None
```

[C#]

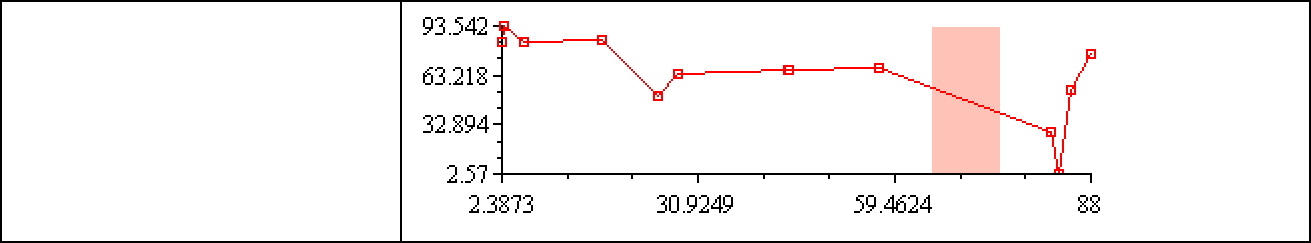
```
DataSet ds = new DataSet();
ds.ReadXml("XMLFile1.xml");
LineGraph5M1.DataSource = ds;
```

	<pre> LineGraph5M1.DataMember = "Position"; if (UsingDates)     LineGraph5M1.DataFieldX = "X"; else     LineGraph5M1.DataFieldX = "Date";  LineGraph5M1.DataFieldY = "Y"; LineGraph5M1.DataBind(); // Don't draw point symbols with this line. LineGraph5M1.Sets[LineGraph5m1.NumSets - 1].PointStyle = LineGraph.PointStyles.None; </pre>
<p><b>CreateGraphSessionVariable</b></p>	<pre> [VB] Sub CreateGraphSessionVariable (SessionVariableName As String)  [C#] void CreateGraphSessionVariable (string SessionVariableName) </pre> <p>Creates the graph image file and saves it to a memory stream. This is useful for creating an .aspx file that returns a link to an image. The image is in the file format specified in the ImageFormat property. If there is an error, no image will be written. For a graph to be drawn, you must do at least one of the following (besides indicating the size of the image):</p> <ul style="list-style-type: none"> <li>• Set the HigherXBound, LowerXBound, HigherYBound, LowerXBound properties</li> <li>• Add at least 2 points to the graph.</li> </ul> <p>If the high boundaries are equal to or smaller than the low boundaries, the image size is too small, or there was an error writing the file, an exception is generated.</p> <p>The sample code below calls a simple ASPX page that only loads the image from the specified session variable and passes back the URL to it so that the image control can show it.</p> <pre> LineGraph5M1.CreateGraphSessionVariable("DataSetGraph") Image1.ImageUrl = "ReturnImage.aspx?Name=DataSetGraph" </pre>

<p>CreateGraphFile</p>	<pre>[VB] Sub CreateGraphFile (ByVal filename As String) [C#] void CreateGraphFile (string filename)</pre> <p>Creates the graph image file and saves it to the path and filename specified. This can be useful in cases where you don't need to generate a custom graph each time a page is viewed. If the name does not have the correct extension, one will be created matching the file format. If there is an error, no image will be written.</p> <p>For a graph to be drawn, you must do at least one of the following (besides indicating the size of the image):</p> <ul style="list-style-type: none"> <li>• Set the HigherXBound, LowerXBound, HigherYBound, LowerXBound properties</li> <li>• Add at least 2 points to the graph.</li> </ul> <p>If the high bounds are equal to or smaller than the low bounds, the image size is too small, or there was an error writing the file, an exception is generated.</p> <pre>LineGraph5M1.CreateGraphFile(Page.MapPath(".") + "\graph.gif")</pre>
<p>CreateGraphBitmap</p>	<pre>[VB] Function CreateGraphBitmap () As Bitmap [C#] Bitmap CreateGraphBitmap ()</pre> <p>Creates the graph image file and returns a .NET Framework Bitmap object. This can be useful if you want to add your own drawings to the graph, or want to use a component that takes a Bitmap or some sort of array or block of data (which a Bitmap can easily be converted to using the Bitmap.Save() method).</p> <p>For a graph to be drawn, you must do at least one of the following (besides indicating the size of the image):</p> <ul style="list-style-type: none"> <li>• Set the HigherXBound, LowerXBound, HigherYBound, LowerXBound properties</li> <li>• Add at least 2 points to the graph.</li> </ul> <p>If the high bounds are equal to or smaller than the low bounds, the image size is too small, or there was an error writing the file, an exception is generated.</p>

	<p>Be sure you include "System.Drawing" in order to use the Bitmap object.</p> <pre>bitmapobject = LineGraph5M1.CreateGraphBitmap()</pre>
<p><b>AddIndicatorLine</b></p>	<pre>[VB] Sub AddIndicatorLine (ByVal ValueY As Double) [C#] void AddIndicatorLine (double ValueY)</pre> <p>Adds a dashed line at the particular Y value across the width of the graph. This is useful for indicating upper and lower limits of point sets, averages, a zero value, or a previous day's stock value to compare to the current graph. You can change the color of the Indicator Line by using the <b>IndicatorColor</b> property.</p> <pre>LineGraph5M1.AddIndicatorLine (35)</pre> 
<p><b>AddIndicatorArea</b></p>	<pre>[VB] Sub AddIndicatorArea (ByVal Start As Double, ByVal Finish As Double) (ByVal Start As DateTime, ByVal Finish As DateTime)</pre> <pre>[C#] void AddIndicatorArea (double start, double finish) (DateTime start, DateTime finish)</pre> <p>Adds a shaded area between the specified X values along the height of the graph. Useful for indicating areas of the graph that are special or speculative. You can change the color of the Indicator Line by using the <b>IndicatorColor</b> property.</p> <pre>LineGraph5M1.AddIndicatorArea (65, 75)</pre>





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The Desaware Licensing System is a cryptographic based licensing system for .NET.

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#### CAS/Tester™

CAS/Tester is an automated Code Access Security tester for .NET assemblies. Because you can never be certain what permissions are allowed on a target system, it is essential that you test your assemblies under a variety of configurations and make sure it will fail gracefully regardless of how a system is configured. CAS/Tester executes your assembly on multiple configurations (over 80 predefined, and no limit to the number you can define). Detailed reports show exactly what exceptions occur under each scenario and where.

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In Strategies you'll learn when and why to migrate to .NET, and when you shouldn't. In Concepts you'll not only learn new concepts, but will unlearn old design patterns that can get you into trouble. And in Code you'll learn about the changes to the language itself, along with a thorough introduction to the .NET framework, including key concepts such as distributed programming and security.

### **How Computer Programming Works**

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