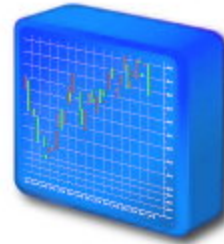


# FlashStockCharts™



## **Service Disclaimer**

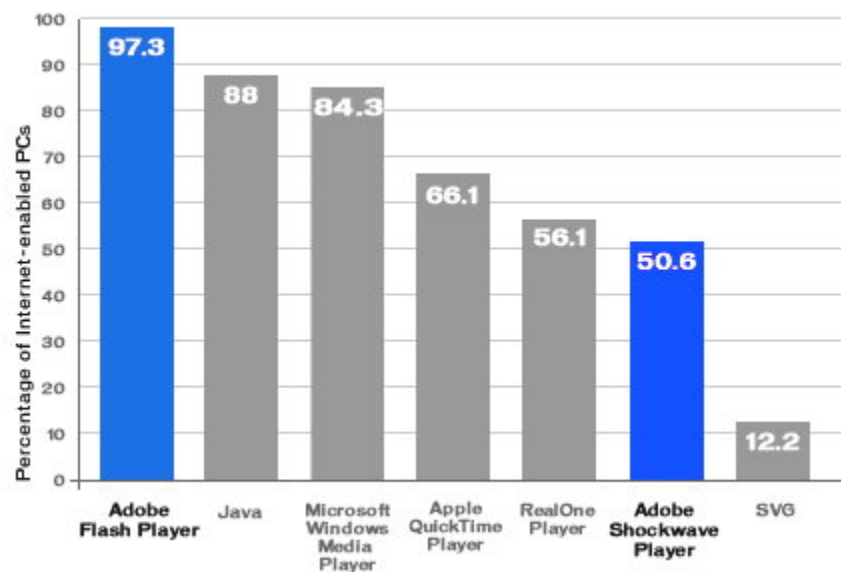
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## Why Adobe Flash?

Since the debut of Google Finance stock charts, companies worldwide have been seeking a fully featured financial charting product based on Adobe Flash (formerly Macromedia Flash).

Compared to other plug-ins such as Java, Flash Player has a small install size and fast initialization time making it ideal for web based financial applications.

The Flash format has become extremely widespread. According to an NPD study completed in June 2006, 97.3% of all Internet users were found to have Flash Player installed, compared with only 88% for the Java runtime environment.



In addition, Flash players exist for a wide variety of different systems and devices. Flash content can run consistently on Microsoft Windows, Mac OS, Linux and various other Unix operating systems, in addition to Smart Phones, PDAs, and other devices.

## Flash Stock Charts by Modulus

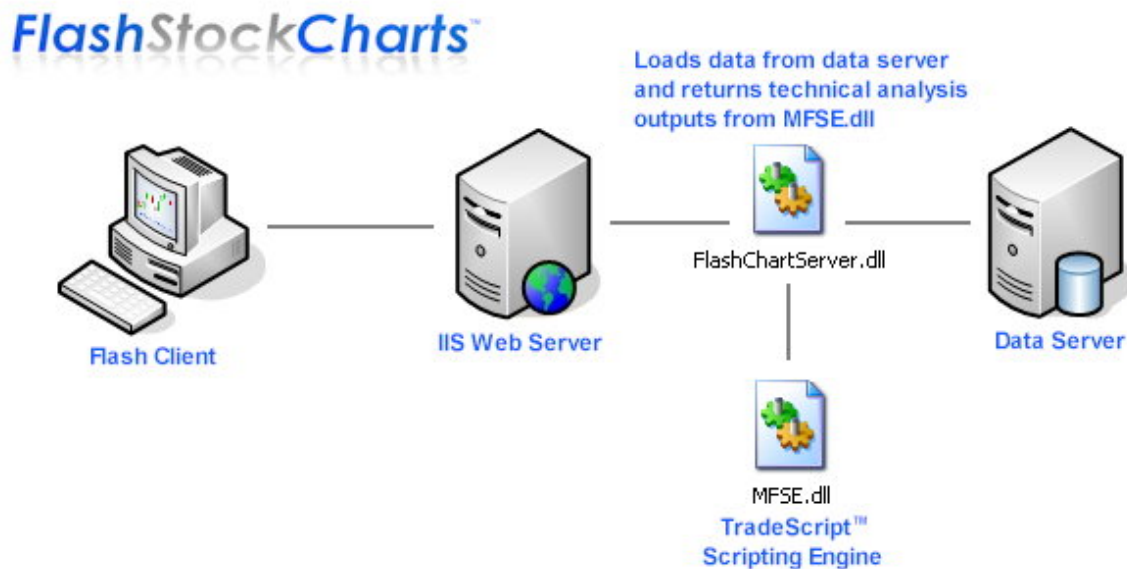
Modulus Financial Engineering developed the world's first financial charting component for Adobe Flash. FlashStockCharts™ is a breakthrough, fully featured stock chart that enables Flash developers and web site creators to add financial charts to web sites or existing Flash applications. Flash developers can customize and compile the provided ActionScript™ source code to display financial charts on literally *any* platform that supports Adobe Flash!

## Overview of FlashStockCharts™

Similar to Java, Adobe Flash renders the end-user interface on the client and communicates with servers in a bidirectional manner.

FlashStockCharts™ communicates with Windows IIS Server to request market data, which may be stored on the same web server, a data server, or sent via a stream from a market data server.

Prior to sending market data back to the client, the web server sends the data to the FlashChartServer object for processing, which is located on the Windows web server. This library is responsible for loading historical market data and creating technical analysis outputs via the Modulus Flash Scripting Engine (MFSE.dll), as outlined in the following diagram.



## **Prerequisites**

FlashStockCharts™ requires Windows 2000 or greater with IIS web server. Installation requires knowledge of ASP, JavaScript, and HTML. An example function is provided that reads market data from standard CSV files. If your data is stored in a different format or retrieved from a remote server, you must modify the FlashChartServer.dll ATL COM component that is written in VC++.

## **Installation**

To install FlashStockCharts™, simply unzip the contents of the distribution zip file into a public directory on your web server. Next, place the MFSE.dll and FlashChartServer.dll files into your Windows System directory. Set the web user permissions for these DLLs to “full”.

Next, copy the Activation.exe program into the Windows System directory and run the program. Enter your order number that was given at the time of registration and click “Activate”. The Activation Wizard will install a license file in your Windows System directory. Next, register the MFSE.dll component: Open a command prompt and type “REGSVR32 FlashChartServer.dll” and press Enter.

Finally, ensure that the Windows directory permissions are set to “full” for the directory where your CSV data files are located on your web server. If you are not using CSV files or if you have made changes to FlashChartServer.dll, skip this step. Installation is complete.

## **Modifications**

The FlashChartServer component reads CSV files by default. Full source code to FlashChartServer is included with FlashStockCharts™. You may modify the source code to read from SQL, Access, XML, a TCP data stream, etc. The VC++ project includes “TODO” comments indicating where to make modifications.

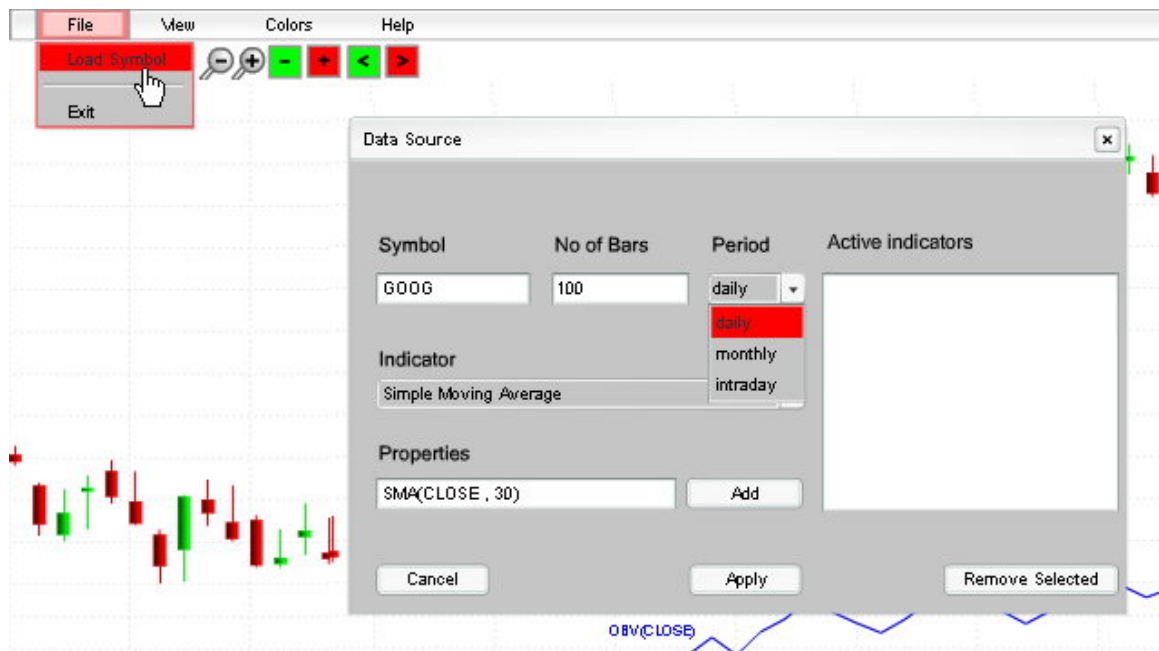
FlashStockChart™ ActionScript source code is licensed under a commercial source code license agreement. If you make changes to the ActionScript source code, you are required to encrypt the .swf Flash files using a third party encryption library. We may encrypt the files for you for a fee or we may recommend an encryption utility that you may purchase. The source code license agreement further requires that you send the compiled files via email to support@modulusfe.com for review prior to publishing your files on the web. This process ensures that the source code will not be decompiled or viewed by unauthorized parties.

## Using FlashStockCharts™

FlashStockCharts™ is similar to the Modulus StockChartX charting component. You can add technical indicators, change the periodicity from intraday to daily or monthly, zoom in, zoom out, scroll left to right using the mouse wheel, resize panels, change properties via a built-in menu, plus much more.

### Changing the Symbol

To change the chart symbol, click “File” on the menu and select “Load Symbol”. You can change the periodicity of the chart by selecting “daily”, “monthly”, or “intraday” from the drop down menu located on Data Source dialog. Note this option may be disabled depending on HTML settings.



You can also change the number of bars to load, or add and remove technical indicators from this dialog. To add a technical indicator, choose an indicator from the indicator drop down menu. You may edit the indicator parameters by viewing the associated indicator help topic (choose “Help” and “Help Contents” from the main menu). Click the “Add” button to add the indicator. To remove an indicator, select the indicator from the “Active Indicators” list and click “Remove Selected”.

Click “Apply” to return to the chart when finished.

## Resizing Panels

Chart panels can be resized by moving the mouse across the divider lines. A red line will display when the mouse moves into a divider area. At this point, you may click the mouse and drag the divider line either up or down. This also works for technical indicator panels as well, so you can control the amount of space that each indicator uses on the chart.



## Zooming and Scrolling

The chart can be scrolled from left to right by using either the red and green buttons on the toolbar or the mouse wheel. In order to scroll, the chart must first be zoomed to a certain degree. To zoom in, click the “+” magnifying glass on the toolbar, then click the chart and drag the mouse as shown in the following image.



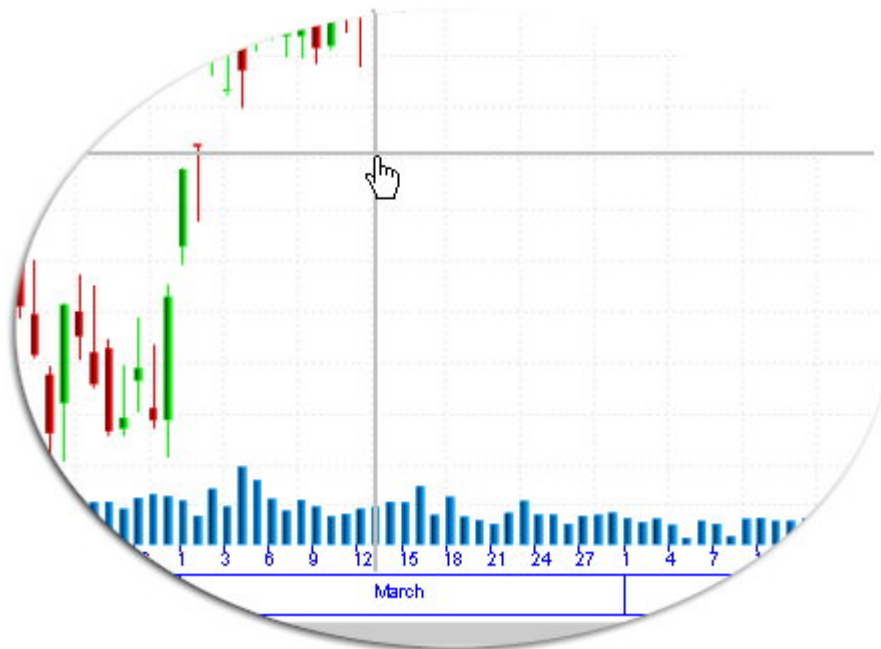
The scrollbar at the bottom of the chart can also control the zoom and scroll levels. Simply click the white scroll box and drag it using the mouse to reposition the chart. The scroll box will update with a number representing the scroll level.

## Inspecting Data

You can inspect the values on the chart by simply left clicking and dragging the mouse across the chart. An info box will display the date, time, open, high, low, close, volume, and x / y coordinates...



To enable crosshairs instead, choose "View", "Crosshairs" from the main menu:



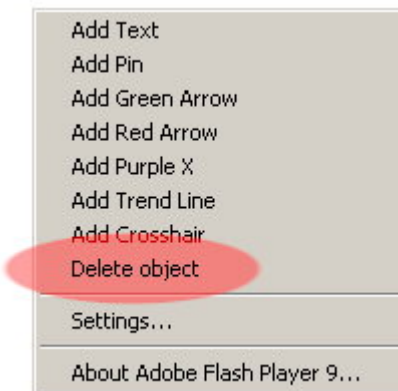


## Drawing on the Chart

Buy, sell, and exit symbols, trend lines, push-pins and text can be added to the chart by simply right clicking on the chart and selecting the associated menu. Note that the “Settings” and “About Adobe Flash Player” menu items are part of the Adobe Flash product. All other menu items on the context menu belong to the FlashStockCharts™ software.



To delete any object on the chart, simply right click on the item and choose “Delete object” from the context menu...



## Default Properties

FlashStockCharts™ offers several customizable properties such as fore color, back color, grid color, and up/down candle color. Default properties can be set within the HTML code. To edit the default values, open [FlashStockCharts.html](#) in your favorite HTML editor or in Notepad, and locate the following param:

```
<param name="FlashVars"  
VALUE="MaxCandleCntToDisplay=100&DefaultBars=100&DefaultSymbol=GOOG&ExitPage=htt  
p://www.modulusfe.com/flash/&DataSource=0&BackColor=0xFFFFFFFF&ForeColor=0X0000FF&Gr  
idColor=0XEAEAEA&UpColor=0X00FF00&DownColor=0XFF0000&XGrid=1&YGrid=1"/>
```

MaxCandleCntToDisplay=100

*The maximum number of bars to display when the chart is updated in real-time.*

DefaultBars=100

*The default number of bars to display when the page loads.*

DefaultSymbol=GOOG

*The default symbol to display when the page loads.*

ExitPage=http://www.modulusfe.com/flash/

*The page to display when the File -> Exit menu is selected*

DataSource=0

*If set to 1, the "Periods" drop down menu will display on the Data Source dialog.  
If set to 0, the menu will not display and periodicity will default to "daily".*

BackColor=0xFFFFFFFF

*Sets the default background color of the chart.*

ForeColor=0X0000FF

*Sets the default foreground color of the chart (text).*

GridColor=0XEAEAEA

*Sets the default grid color (if grids are enabled).*

UpColor=0X00FF00

*Sets the default up-candle color.*

DownColor=0XFF0000

*Sets the default down-candle color.*

XGrid=1

*If set to 1, the x-grid will display, otherwise if set to 0, the x-grid will not display.*

YGrid=1

*If set to 1, the y-grid will display, otherwise if set to 0, the y-grid will not display.*

## Resizing FlashStockCharts™

Charts may be resized to take advantage of the browser's entire screen width and height by editing the FlashStockChartX.html code. Simply change the width and height HTML properties for the Flash object.

## Gradient Colors and Mountain Charts

FlashStockCharts™ can display gradient backgrounds. Choose "Colors" and "Gradient Top" or "Gradient Bottom" from the main menu. You can also view technical indicators as either line series or mountain charts by toggling the "Colors", "Series Gradient Style" property from the main menu.



## FlashChartServer Component

As previously noted, the FlashStockChart™ Flash application communicates with IIS Server. It communicates via HTTP using the GetData.asp page located in the same directory that the FlashStockCharts.swf Flash file resides in.

For each chart request, GetData.asp creates an instance of the FlashChartServer object on the server. This object is responsible for fetching the data, inserting it into MFSE (the scripting engine), and returning the data to the Flash client as shown in the following example.



```
<%  
    Dim symbol  
    Dim script  
    Dim bars  
    Dim periodicity  
  
    script = Request.QueryString("chart_script")  
    symbol = UCase(Request.QueryString("chart_symbol"))  
    bars = Request.QueryString("no_bars")  
    periodicity = Request.QueryString("periodicity")  
  
    'TODO:  
    'Make sure that the requested symbol is available here.  
    'You may connect to a database or read a file to verify  
    'the symbol here. This MUST be done here - no exceptions.  
    If symbol <> "GOOG" Then symbol = "GOOG"  
  
    If Len(symbol) < 1 And Len(symbol) > 10 Then Response.End()  
    If periodicity = "" Then periodicity = "daily"  
  
    Dim obj, data  
    Set obj = Server.CreateObject("FlashChartServer.ChartData")  
    obj.DataPath = "c:\wwwroot\yourwebsite\flash"  
    data = obj.GetData(CStr(script), CStr(symbol), periodicity, bars)  
    Set obj = Nothing  
  
    Response.Write data  
%>
```

The **DataPath** property sets the directory where your data is located.

The **GetData** function takes the chart script, symbol, periodicity and number of bars to return price data and technical analysis outputs to the Flash client.

Notice the simplicity of this script. This is literally all of the ASP code that is required to host FlashStockCharts on your web server.

## Modifying FlashChartServer

The following two functions may be modified based on your data source.

By default, FlashChartServer loads data in the following CSV format:

YYYYMMDD,HHMMSS,Open,High,Low,Close,Volume

Each record is separated by a return and new line (\r\n).

The following FlashChartServer function reads the CSV files into the BarDataVector structure array (included in stdafx.h). You may modify this function to read data from SQL Server, Access, XML, or a live stream.

```
BarDataVector LoadCSVFile(const char *const filePath)
{
    using namespace std;

    BarDataVector v;

    ifstream file(filePath);

    assert(file.is_open());
    if(!file.is_open()) return v; // missing file may be handled here

    while (true)
    {
        BarData s;

        getline(file, s.TradeDate, ',');
        getline(file, s.TradeTime, ',');

        file >> s.OpenPrice;
        file.get(); // skip the separator character

        file >> s.HighPrice;
        file.get(); // skip the separator character

        file >> s.LowPrice;
        file.get(); // skip the separator character

        file >> s.ClosePrice;
        file.get(); // skip the separator character

        file >> s.Volume;
        file.get();

        if (file.eof())
            break;

        v.push_back(s);
    }

    return v;
}
```

The following C++ function converts the dates and times into Julian dates.

```
// This example function converts date/time strings in
// the example CSV files into numbers.
// TODO: Change this function if you change the date/time format.
double GetJDate(const char* date, const char* time,
               IScriptOutputPtr ptr)
{
    string dt = date;
    string y = dt.substr(0,4);
    string m = dt.substr(4,2);
    string d = dt.substr(6);

    string tm = time;
    string hh = tm.substr(0,2);
    string mm = tm.substr(2,2);
    string ss = tm.substr(4);

    return ptr->ToJulianDate(atol(y.c_str()),
                            atol(m.c_str()), atol(d.c_str()),
                            atol(hh.c_str()), atol(mm.c_str()),
                            atol(ss.c_str()), 0);
}
```

### **Customization Service**

If you would like a free quote for having Modulus customize FlashStockCharts™ ActionScript source code or FlashChartServer C++ source code, please send an email describing the type of customizations you need to [sales@modulusfe.com](mailto:sales@modulusfe.com). We provide quality software development at an affordable price, on time and within your budget!

**This concludes the FlashStockCharts overview. For further information, please contact us at [sales@modulusfe.com](mailto:sales@modulusfe.com)**

**<http://www.modulusfe.com/flashstockcharts/>**