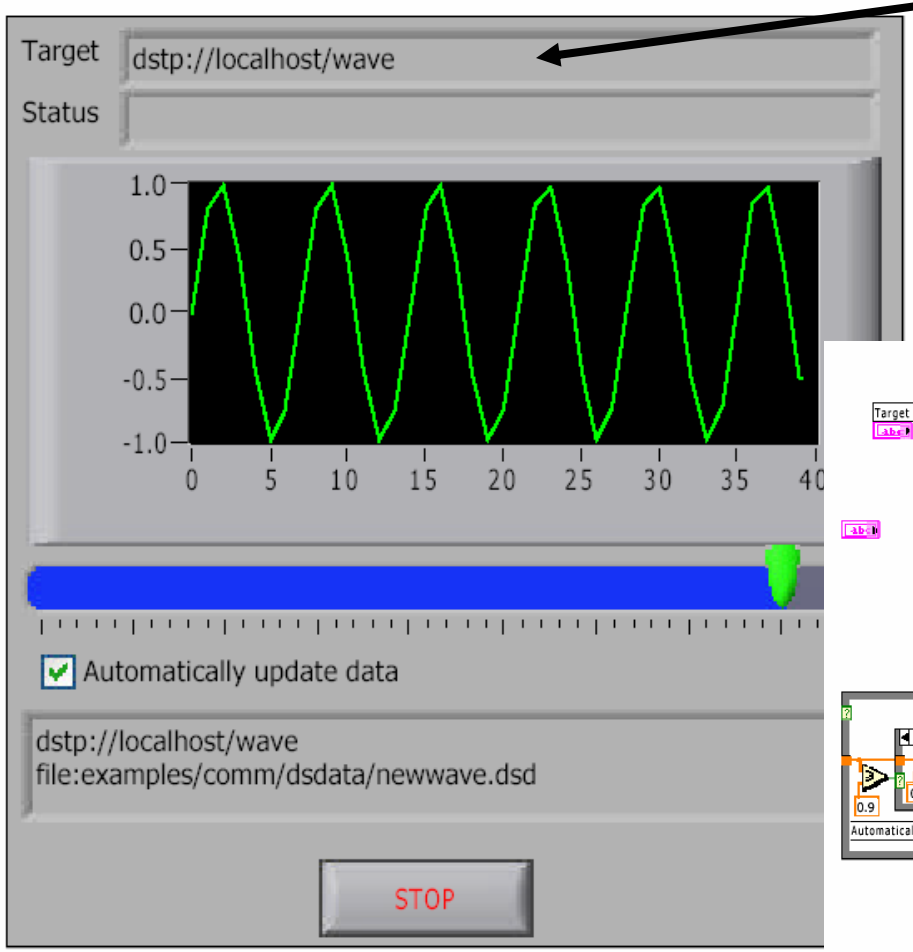
Lesson 6
(week March 22-28)
Using other LabVIEW Features

- Remote clients see and exchange data--Data Socket; Several clients can receive the data
- View & Control VI Front Panels remotely--Requires no programming; Multiple clients can view the same panel simultaneously; Only one client can control the front panel at a time

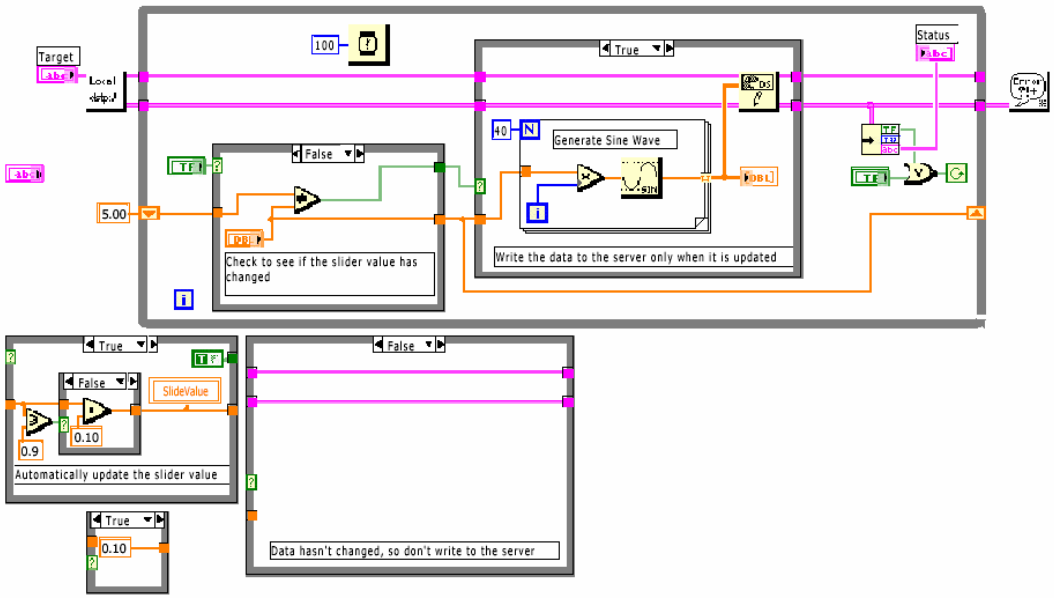
Using DataSocket Technology

DataSocket Transport Protocol (dstp)

You publish (write) or subscribe (read) data by specifying a URL, in much the same way you specify URLs in a Web browser.



1. Find the **VI from Help»Find Examples...»Search**
2. **Type in** "datasocket" and **search**
3. Choose **DS Writer.vi**

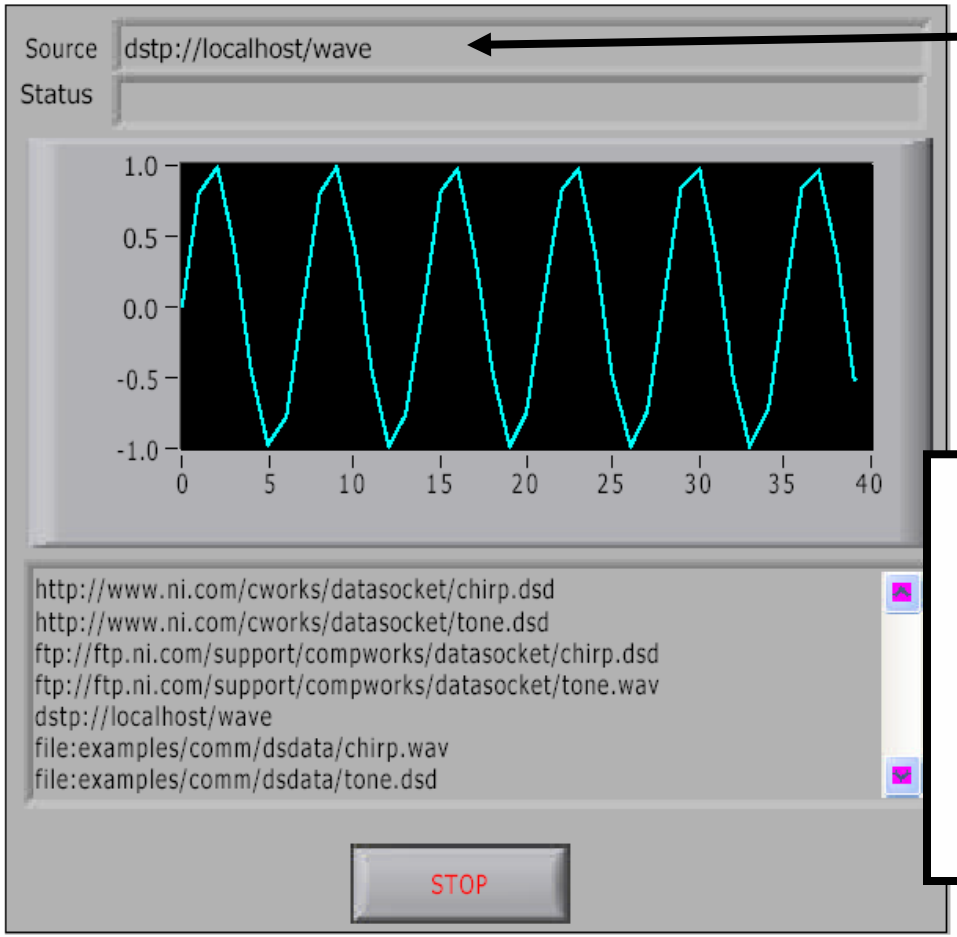


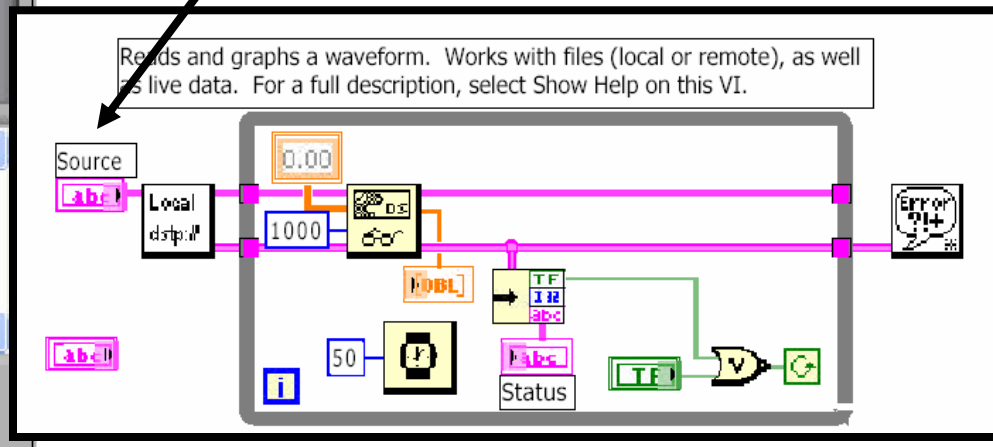
Using DataSocket Technology

DataSocket Transport Protocol (dstp)

1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**datasocket**" and search**
3. Choose **DS Reader.vi**

specifying a URL using dstp

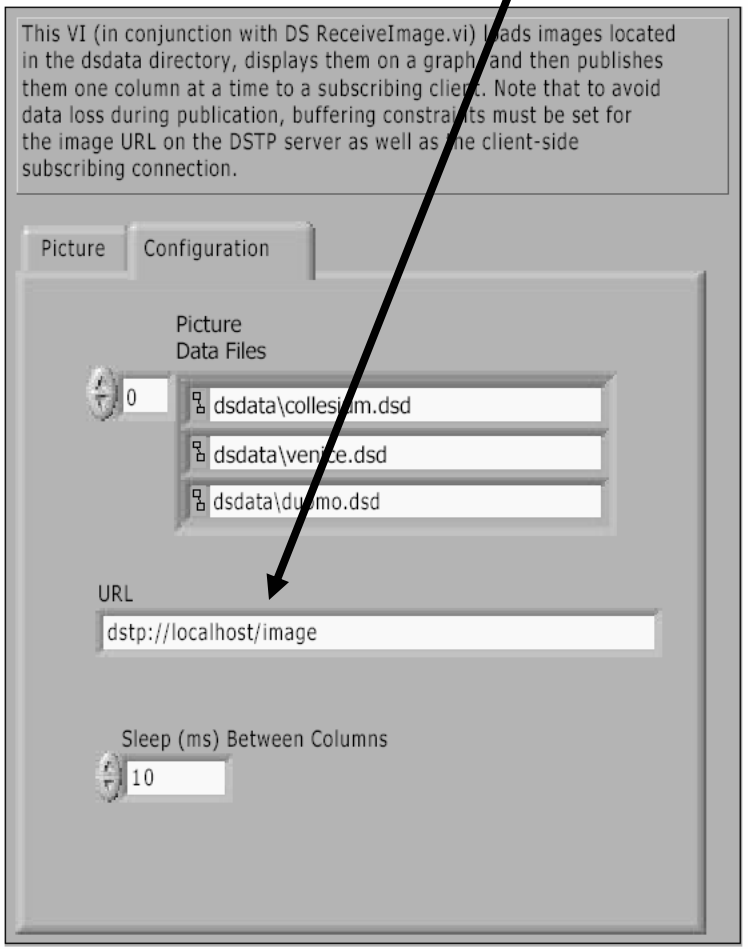




Using DataSocket Technology

DataSocket Transport Protocol (dstp)

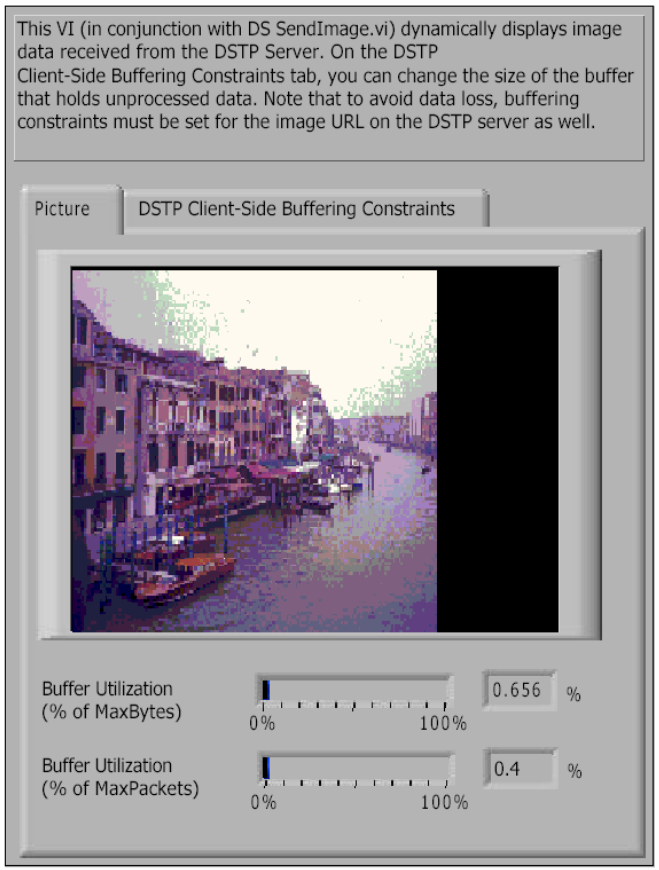
1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**datasocket**" and search**
3. Choose **DS SendImage.vi**

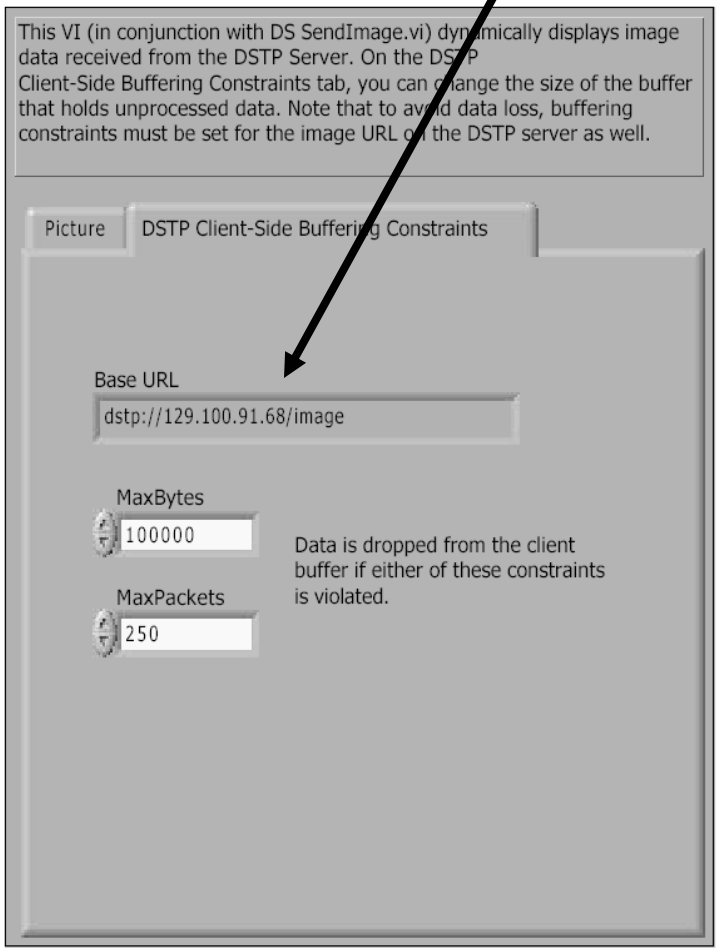


Using DataSocket Technology

DataSocket Transport Protocol (dstp)

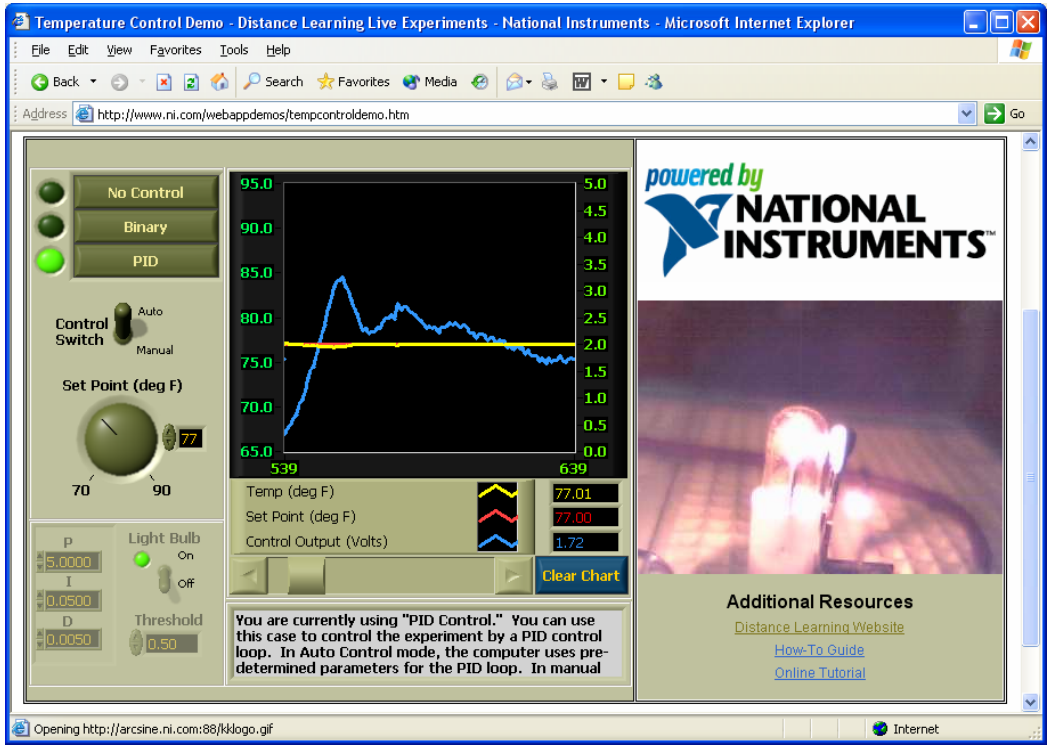
1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**datasocket**" and search**
3. Choose **DS ReceiveImage.vi**





Remote Front Panels - Resources

- NI Developer Zone (zone.ni.com)
  - Search for Remote Front Panel
  - Tutorials & Instructions Are Available for Download
  - Information on Incorporating Web Cameras into Remote Panel Applications



Using built-in web server technology

Configuring the server for clients

A. Configure the Web Server by selecting Tools»Options and selecting the Web Server pages from the top pull-down menu:

1.Web Server: Configuration

2. Web Server: Browser Access-->input the remote computer name or IP

3. Web Server: Visible Vis-->license to see Vis and theses VIs should be in memory of the Server

Use these pages to control browser access to the server and to specify which front panels are visible remotely.

Configuring for clients

B. Configure the Web client by opening a new VI and selecting Operate»Connect to Remote Panel to display the **Connect to Remote Panel** dialog box:

1.Input the IP address of the server and the VI you want to see

2. Indicate if you want to control it

you can access to the server and to specify which front panels are visible and controllable remotely.

Using built-in web server technology

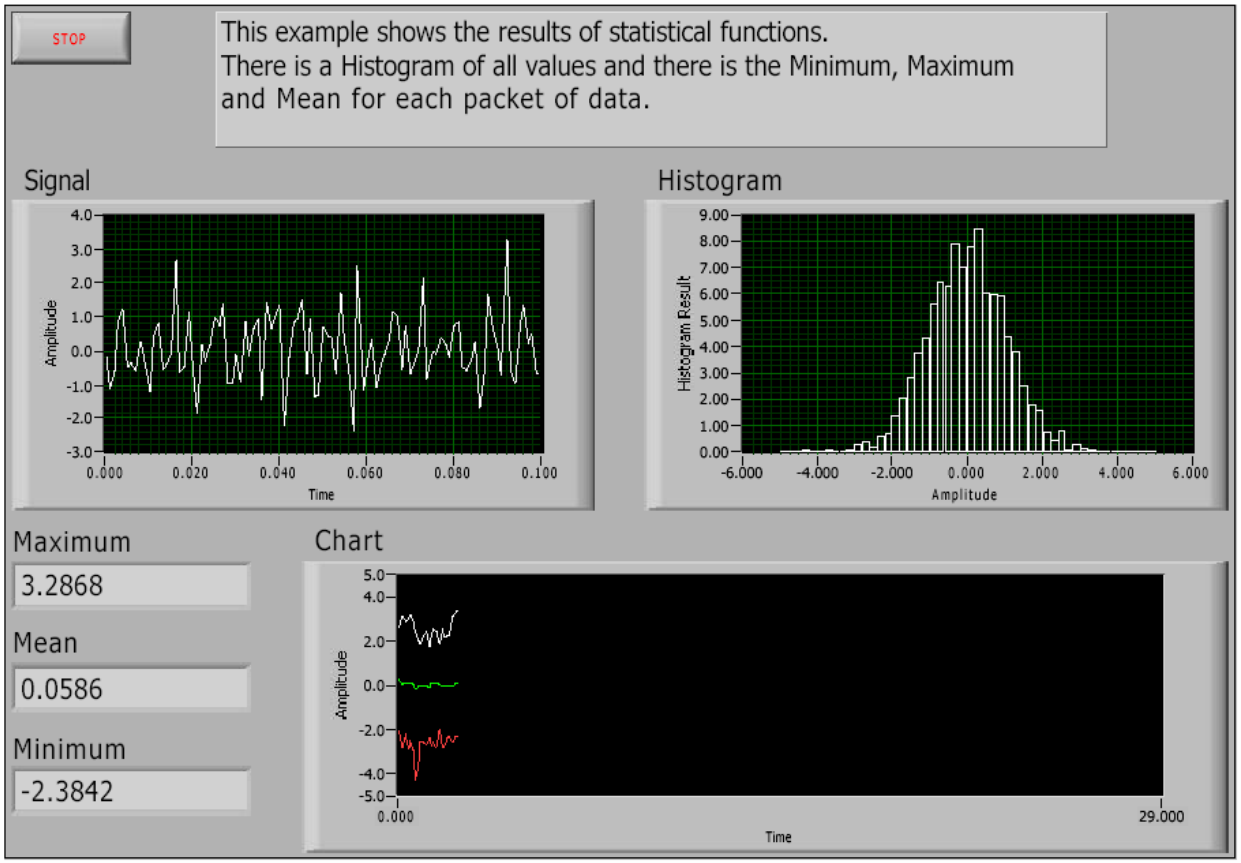
1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**statistics**" and search**
3. Choose **statistics.vi**
4. **Follow the instructions on last transparency to do the configuration**
5. **Connect and run**

Please practice in a group of 3

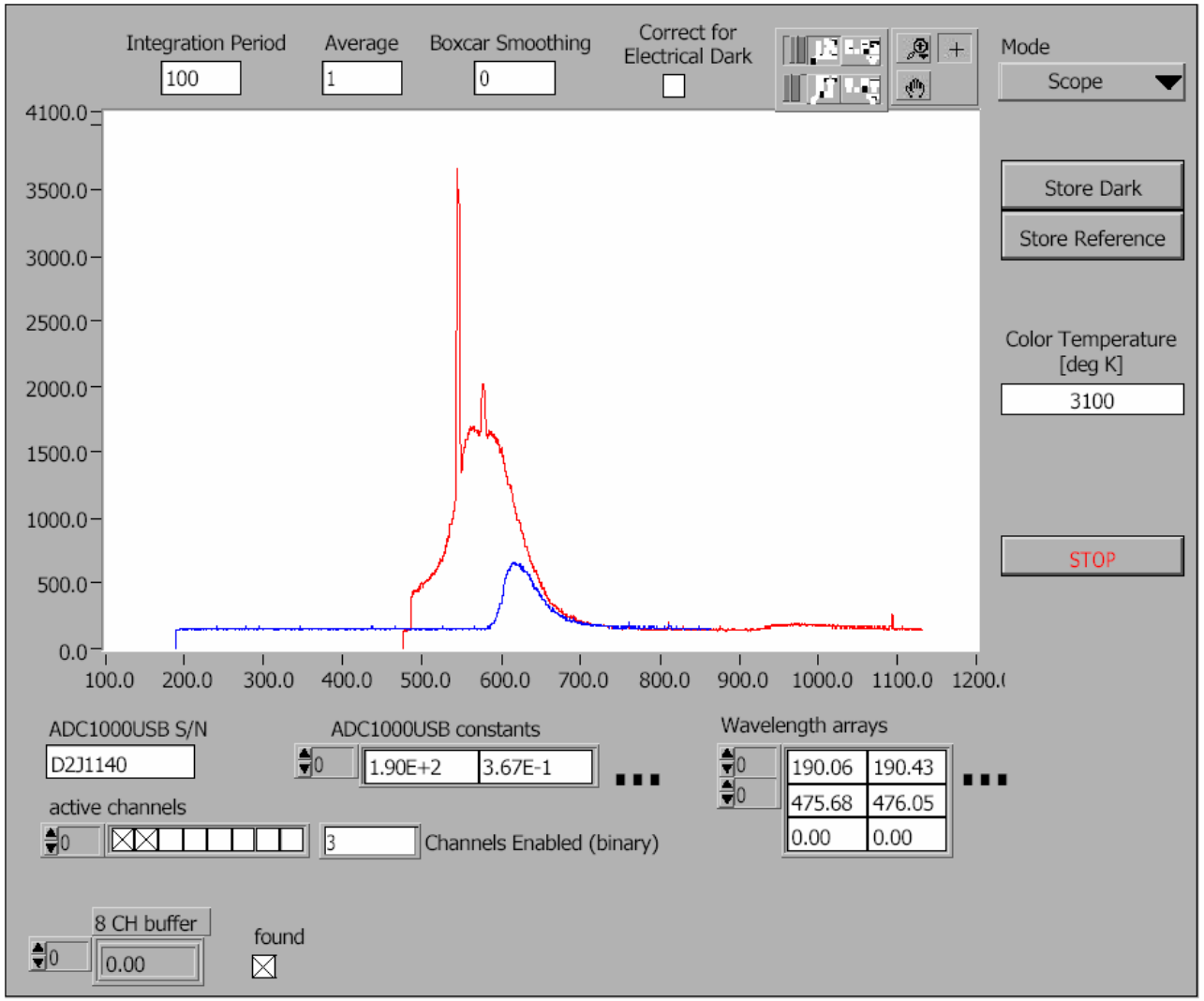
Note that the computer name is as following:

UC08 -->

uc08.uc.publab.uwo.ca



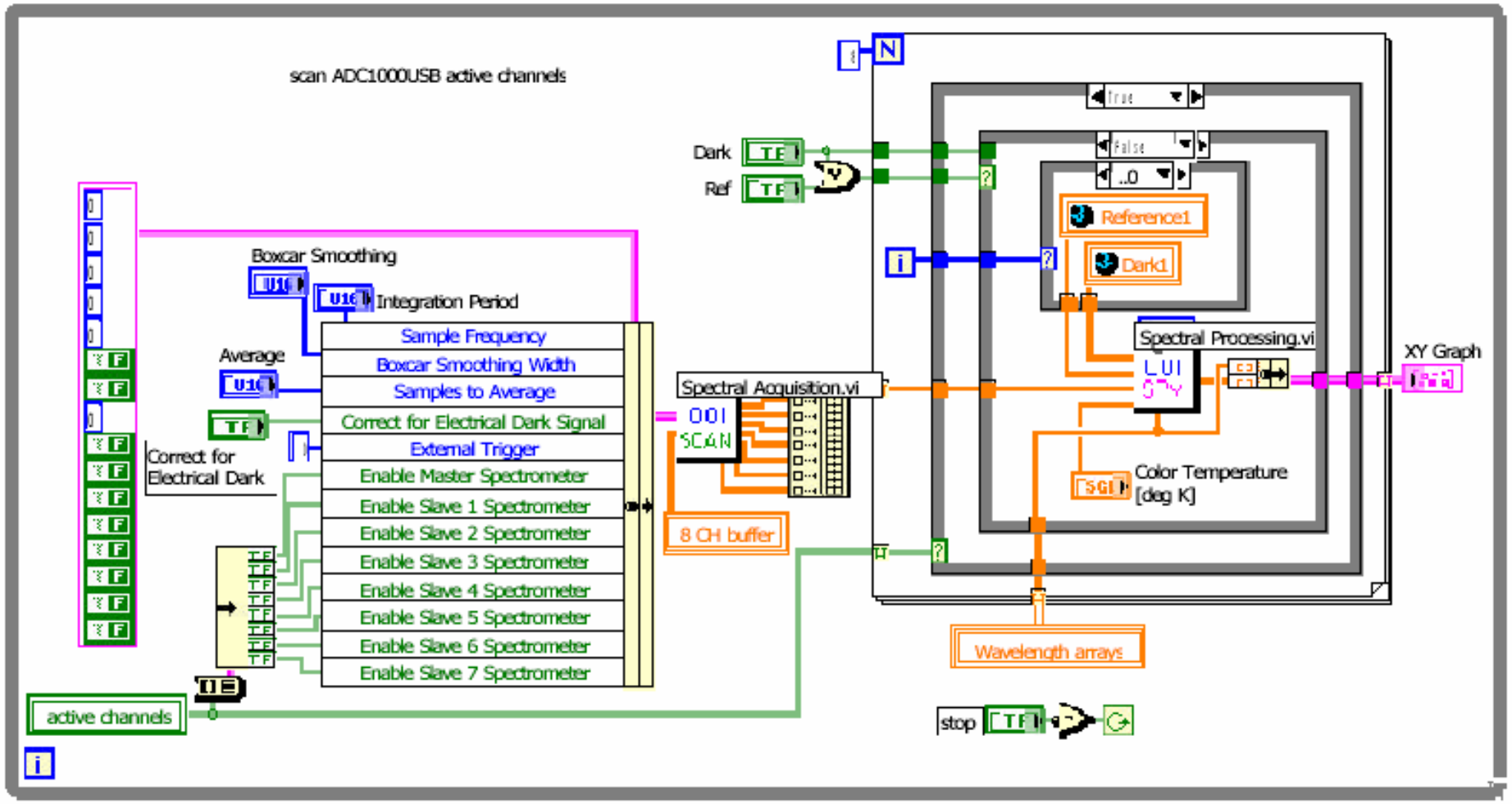
Using built-in web server technology
Real remote control to an Ocean Optics spectrometer



The LabVIEW Professional Development System includes a remote panel license that allows five clients to view and control a front panel remotely. You can upgrade the remote panel license to support more clients.

Using built-in web server technology

Real remote control to an Ocean Optics spectrometer



Using built-in web server technology

Real remote control to an Ocean Optics spectrometer

The instructor's computer IP address is 129.100.100.145 and the remote VI is ADC1000USB_Sample.vi

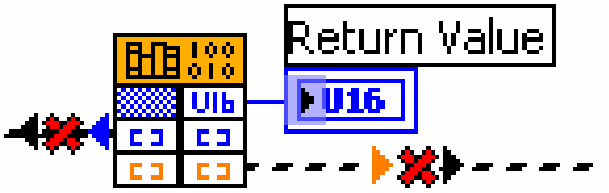
Is it safe? Yes, the server can disconnect the client anytime by selecting Tool>>Remote Pane Connection Manager. And the client can not modify the Block Diagram.

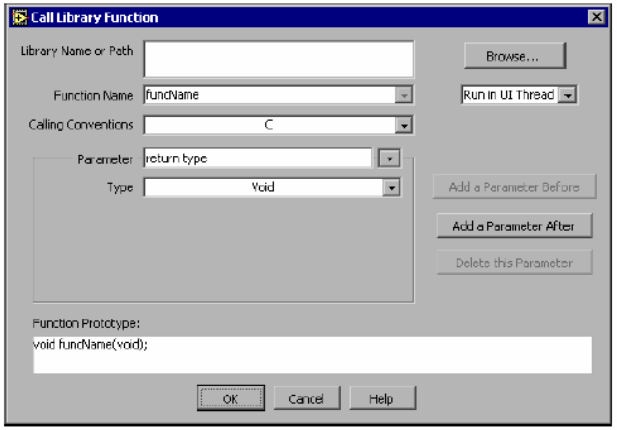
There are other communication methods in LabVIEW, Please refer to Chapter 18--Networking in LabVIEW of *User Manual*

Calling Code from Text-Based Programming Languages

1. Use the Call Library Function Node to call most standard shared libraries or Dynamic Link Libraries (DLLs).

For instance: in the ADC1000USB_Sample.vi, we use All functions>>Advanced>> Call Library Function Node  **and then right-click>>configure**





2. Use Code Interface Node CIN as an alternative method for calling source code written in C.

The Call Library Function Node generally is easier to use than the CIN.

ActiveX Objects, Properties, Methods, and Events

ActiveX-enabled applications include objects that have exposed properties and methods that other applications can access.

Objects can be visible to the users, such as buttons, windows, pictures, documents, and dialog boxes, or invisible to the user, such as application objects.

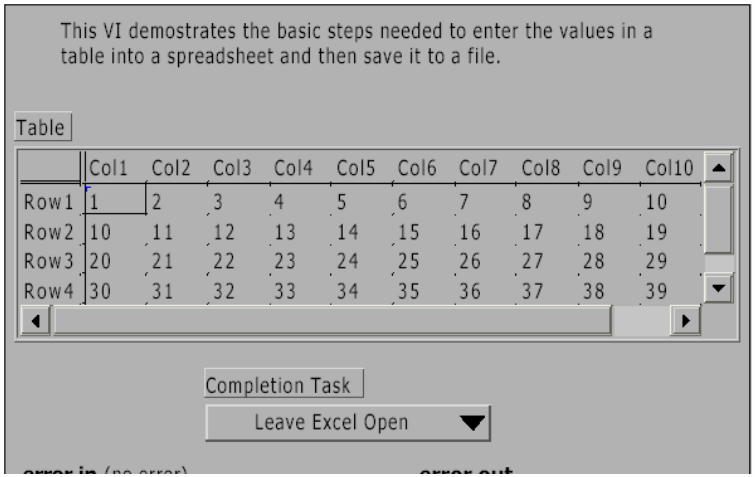
LabVIEW as an ActiveX Client

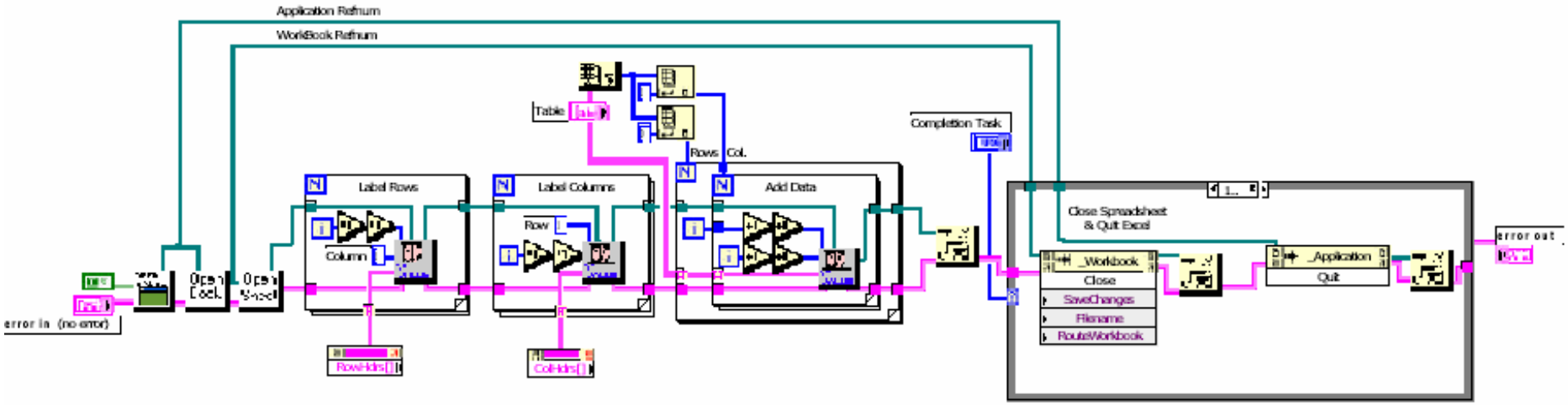
When LabVIEW accesses the objects associated with another ActiveX-enabled application, it is acting as an ActiveX client.

- select **all controls>>refnum>>automation refnum** control in front P
- Right-click this control to select **Active Class** from the type library
- In block diagram, use the **Property Node** to get (read) and set (write) the properties associated with an ActiveX object.
- Use the **Invoke Node** to invoke the methods associated with an ActiveX object.

LabVIEW as an ActiveX Client

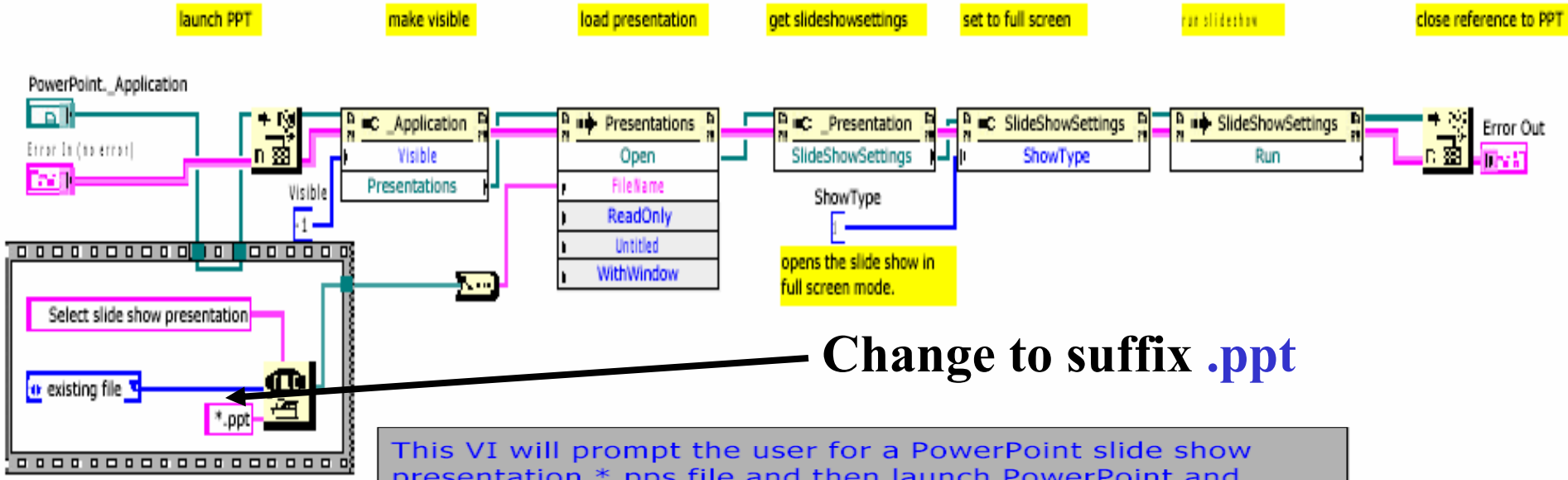
1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**ActiveX**" and search**
3. Choose **Writer table to XL.vi**



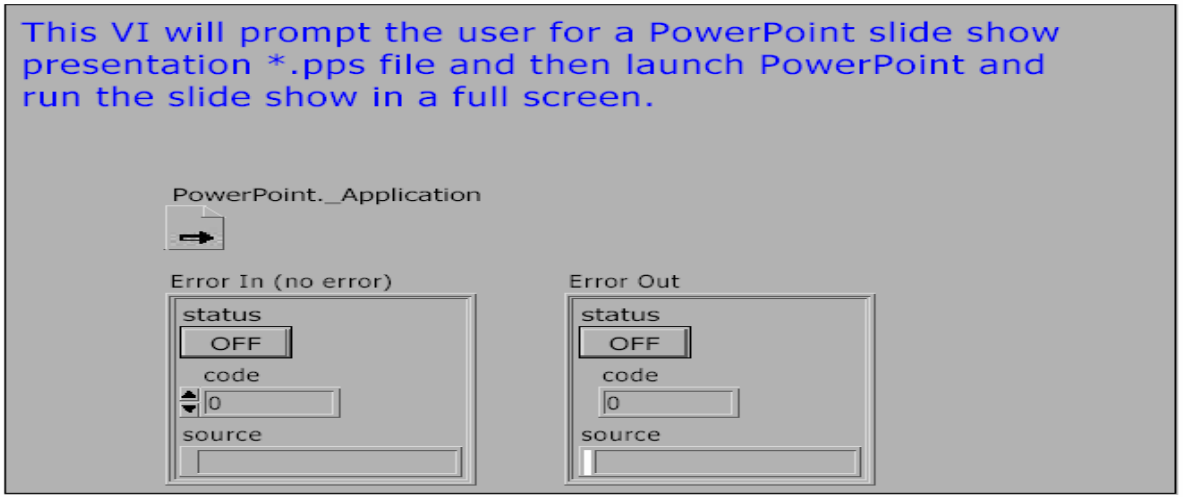


LabVIEW as an ActiveX Client

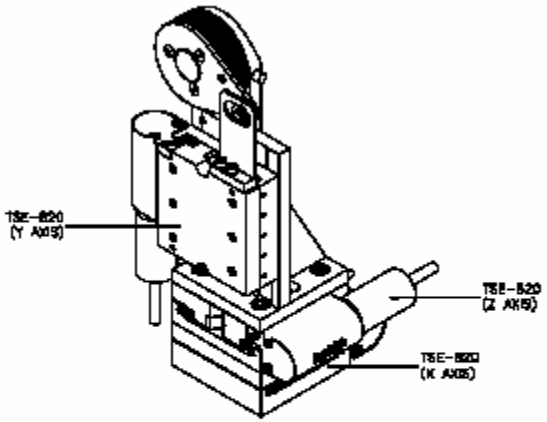
1. Find the **VI from Help»Find Examples...»Search**
2. **Type in "**ActiveX**" and search**
3. Choose **slideshow.vi**



Change to suffix .ppt



LabVIEW as an ActiveX Client



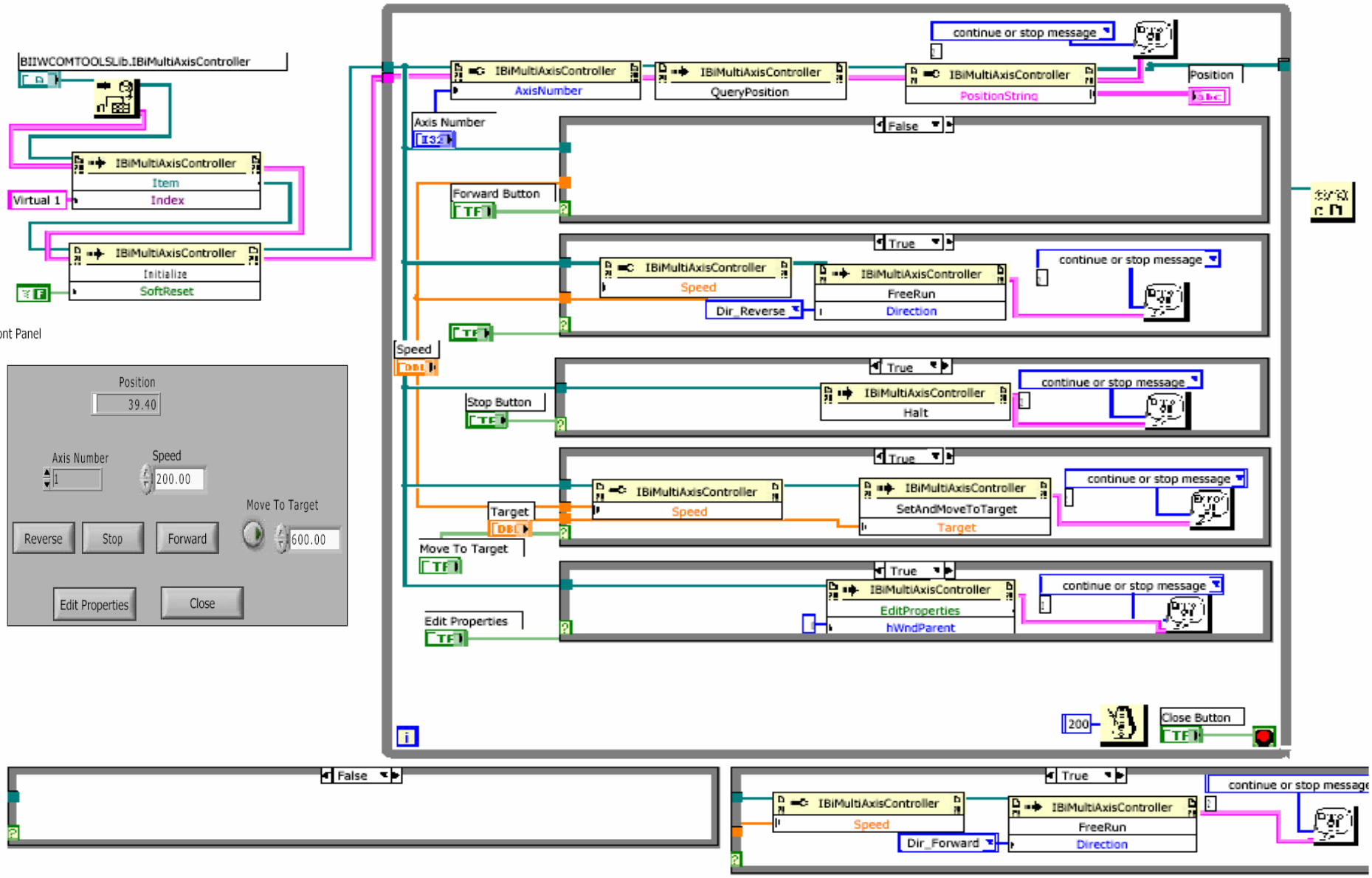
FREEDOM 1500-3, 3-Axis Robot

Burleigh's FREEDOM™ 1500 Nano Robot systems with 8200 Inchworm ® motor controllers offer automated alignment systems, with 20-nanometer linear resolution.

We will use their demo LabVIEW VI (DemoLV.vi) to demonstrate capabilities for both remote control and Active X application access.

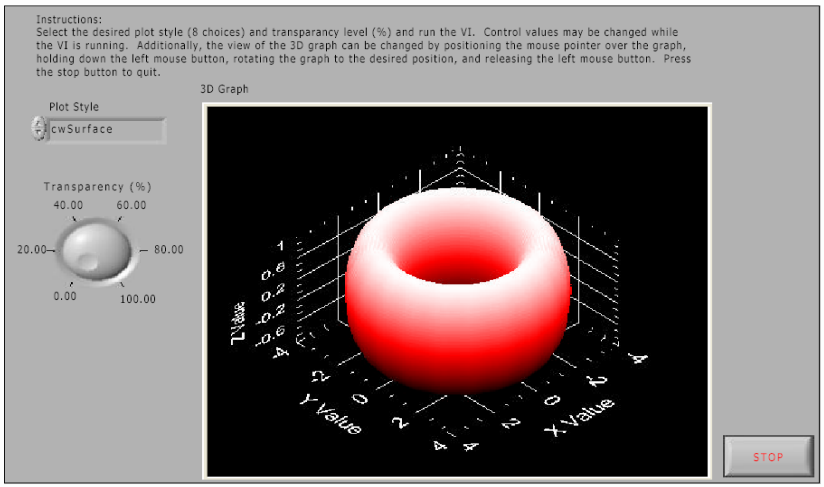
LabVIEW as an ActiveX Client

Block Diagram



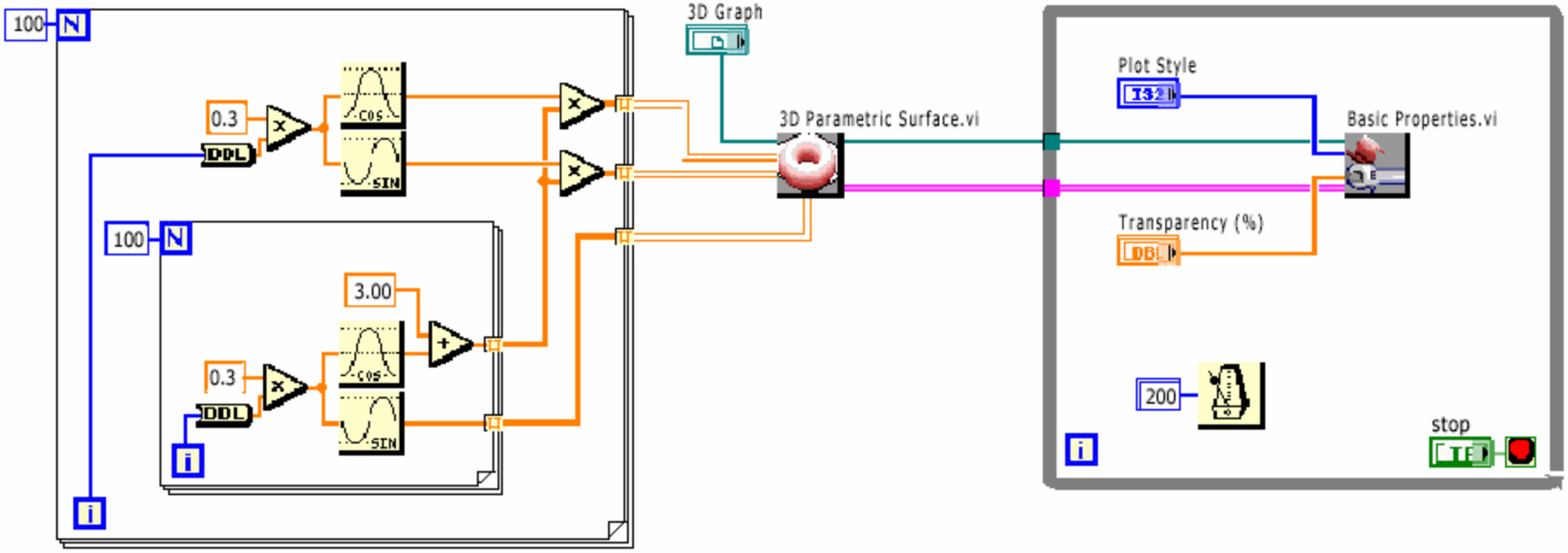
LabVIEW as an ActiveX Client of MS Word

Front Panel



Look at the two sub Vis: 3D Parametric Surface.vi and Basic Properties.vi

Block Diagram

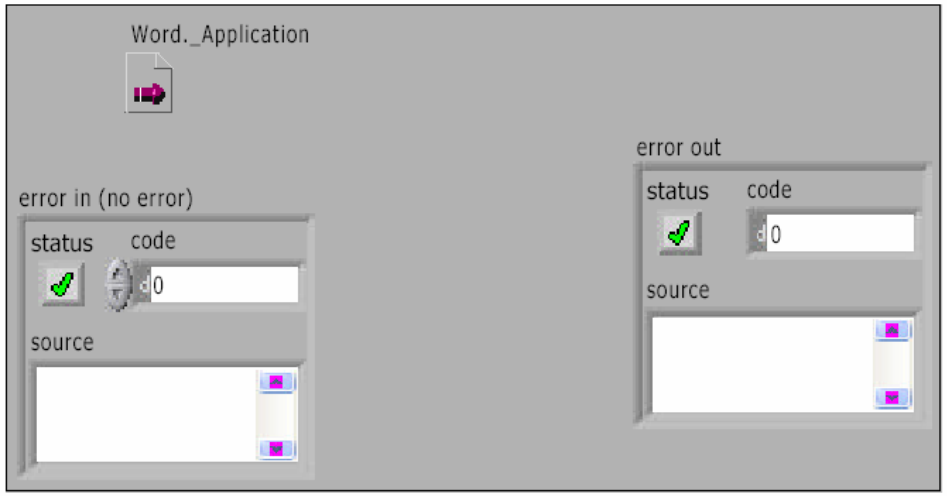


Build the X, Y, and Z matrices that form the 3D parametric torus surface.

Plot the torus surface on the CWGraph3D Active X control.

Update the plot style and transparency properties of the 3D parametric surface.

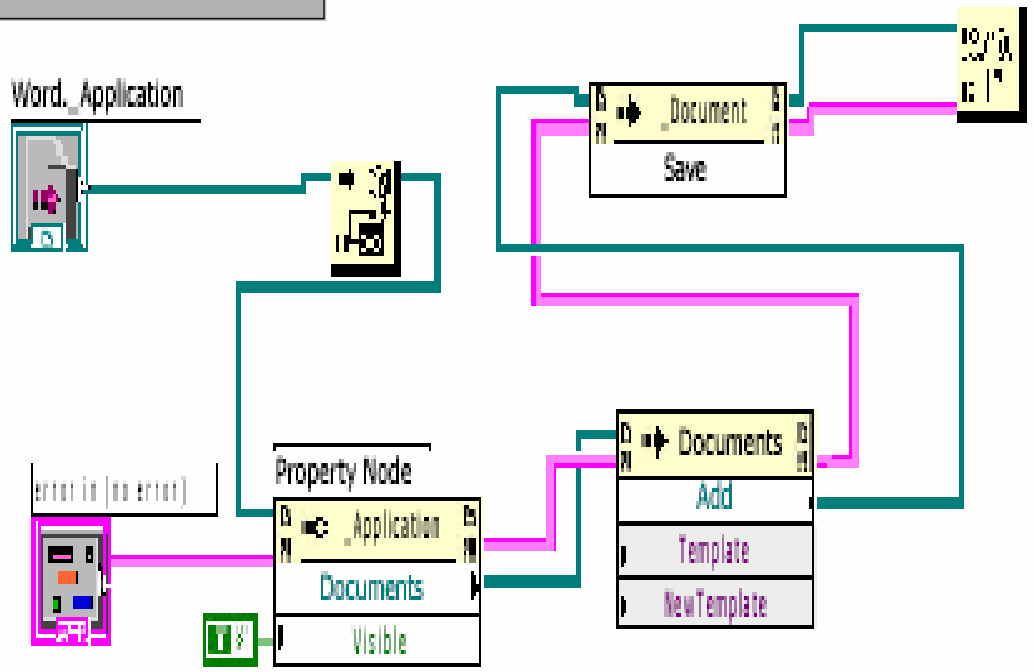
LabVIEW as an ActiveX Client of MS Word



Homework:

Modify the VI to close and quit the PowerPoint Application at the end.

Please refer the example: Writer table to XL.vi



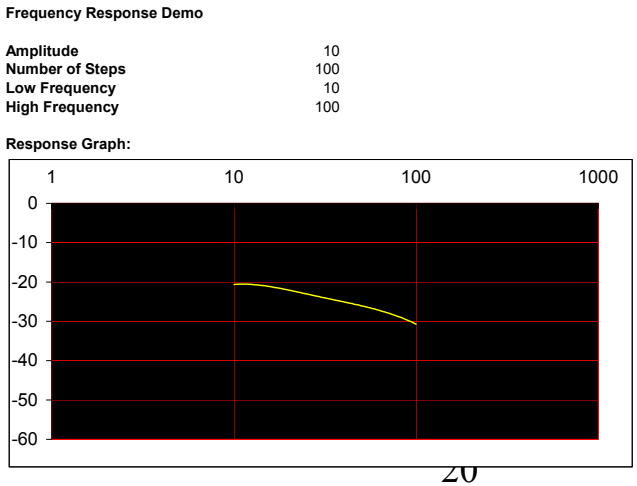
ActiveX Objects, Properties, Methods, and Events

LabVIEW as an ActiveX Server

Other ActiveX-enabled applications, such as Microsoft Excel, can request properties, methods, and individual VIs from LabVIEW, and LabVIEW acts as an ActiveX server.

For example, you can embed a VI graph in an Excel spreadsheet and, from the spreadsheet, enter data in the VI inputs and run the VI. When you run the VI, the data plot to the graph. Refer to the examples\comm\freqresp.xls for an example of using LabVIEW properties and methods in an Excel spreadsheet.

Closely look at **Tools>>Macro>>Visual Basic Editor**



Note 1 : Use Ctrl+M to clear the chart, Ctrl+L to run the vi.
Note 2 : Before you run this example go to LV Preferences/ Server Configuration and enable Active-X and all server Resources. Under Preferences/Server Exported Vis, allow access to freqresp.llb.

Summary

1. Two features of LabVIEW for seeing data and remote control:

Data socket to indicate an URL and built-in web server technology

2. Calling Code from Text-Based Programming Languages

Use the Call Library Function Node and Code Interface Node

3. ActiveX Objects, Properties, Methods, and Events

LabVIEW accesses the objects associated with another ActiveX-enabled application, it is acting as an ActiveX client.

Other ActiveX-enabled applications can request properties, methods, and individual VIs from LabVIEW, and LabVIEW acts as an ActiveX server.