

Lesson 4

(week Dec. 16-22)

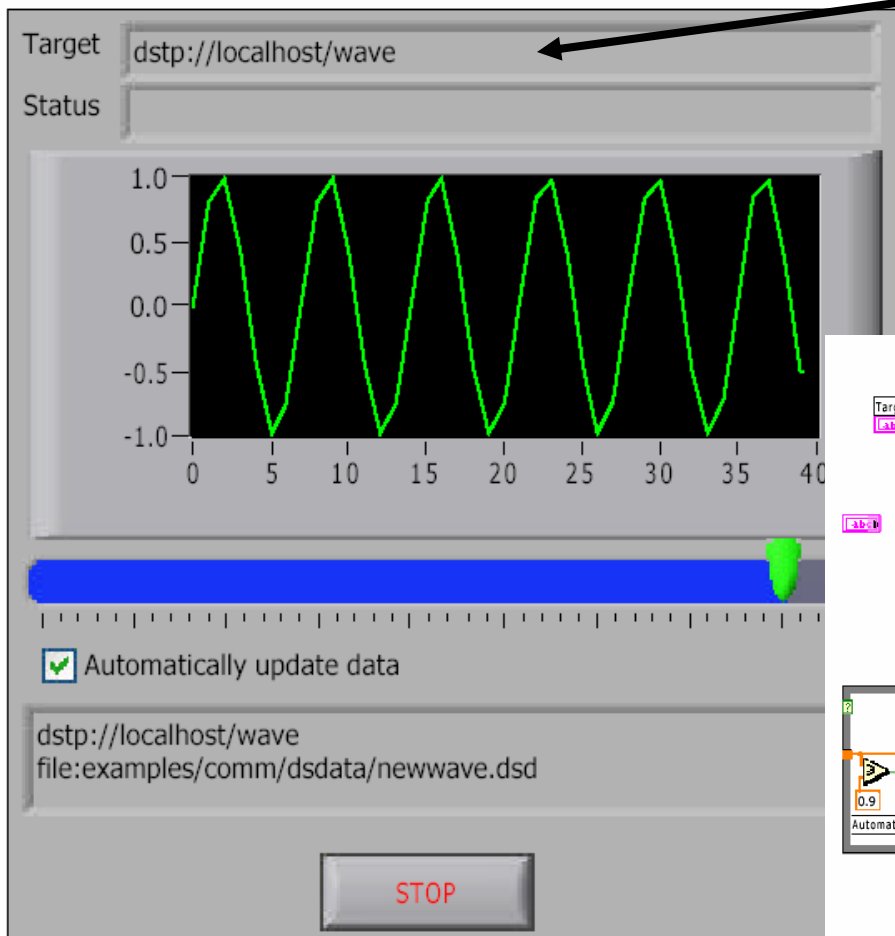
Using other LabVIEW Features

- 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

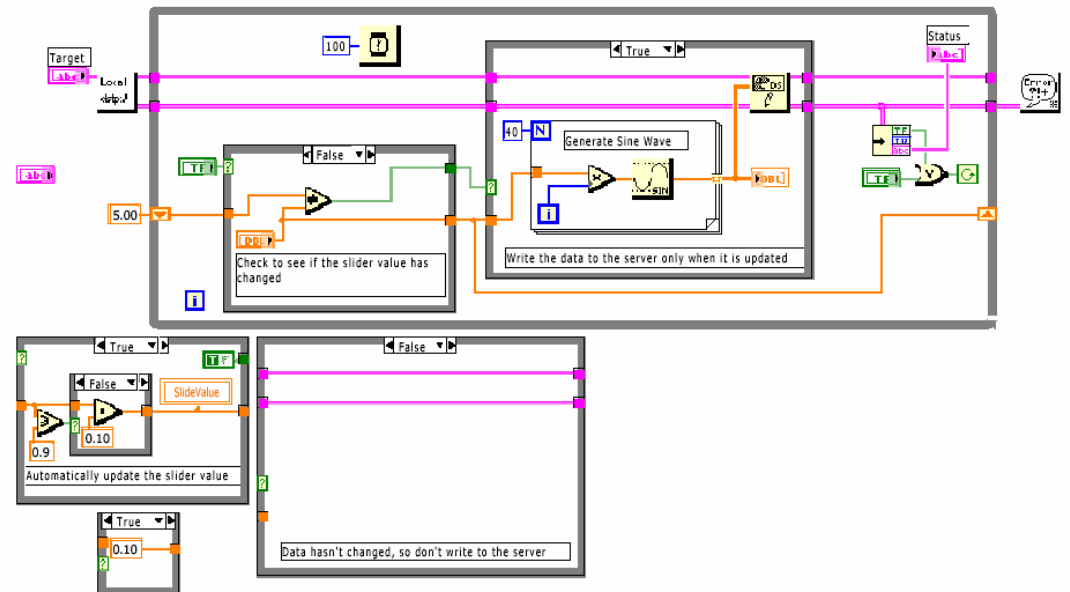
Using DataSocket Technology

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.



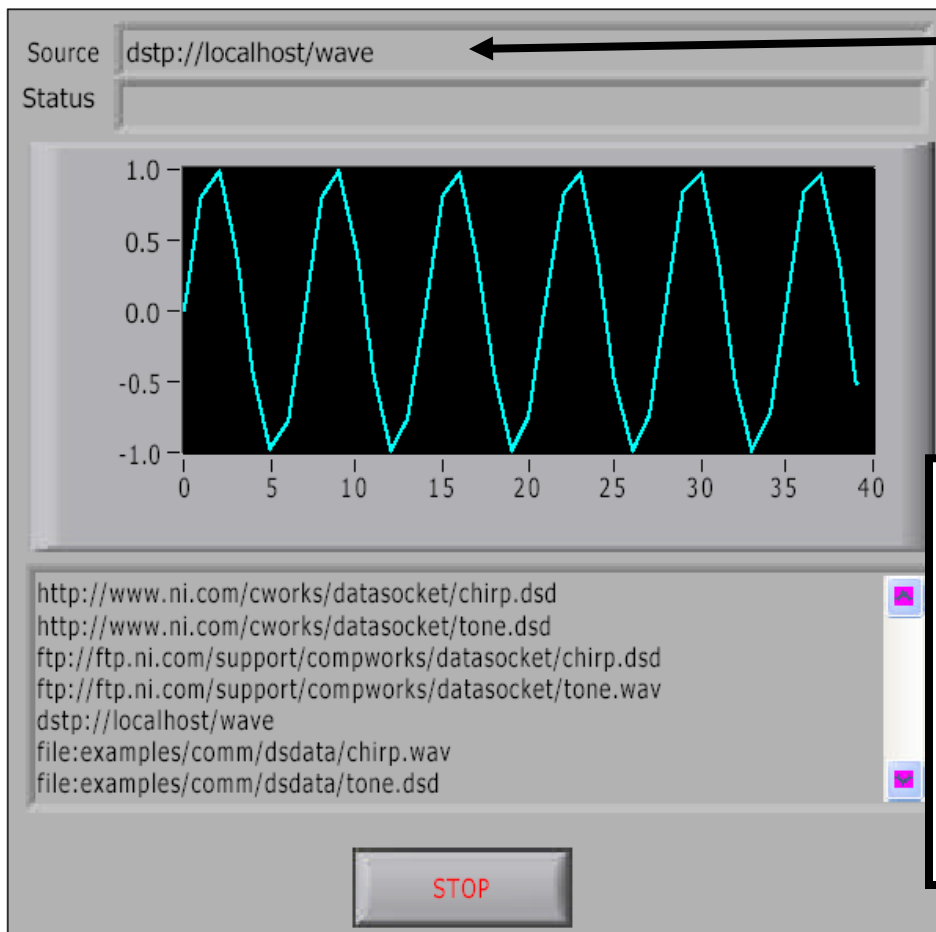
1. Find the VI from **Help»Find Examples...»Search**
2. Type in “**datasocket**” and search
3. Choose **DS Writer.vi**



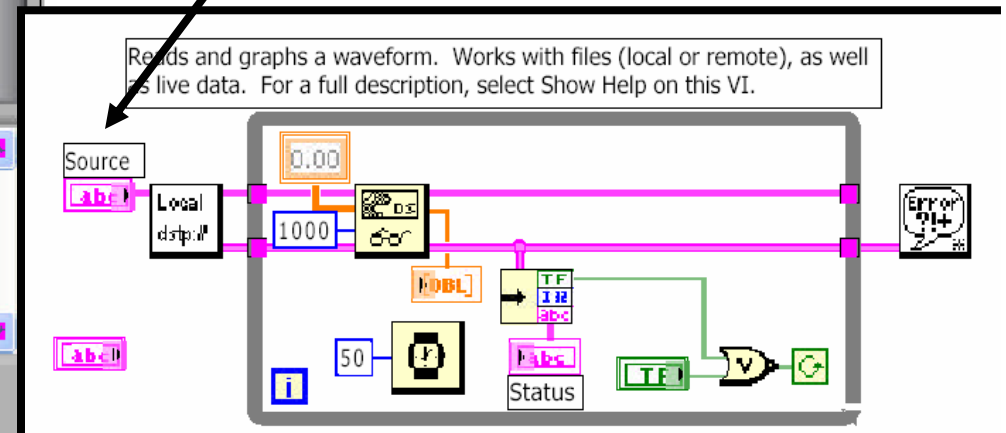
Using DataSocket Technology

DataSocket Transport Protocol (dstp)

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3. Choose **DS Reader.vi**



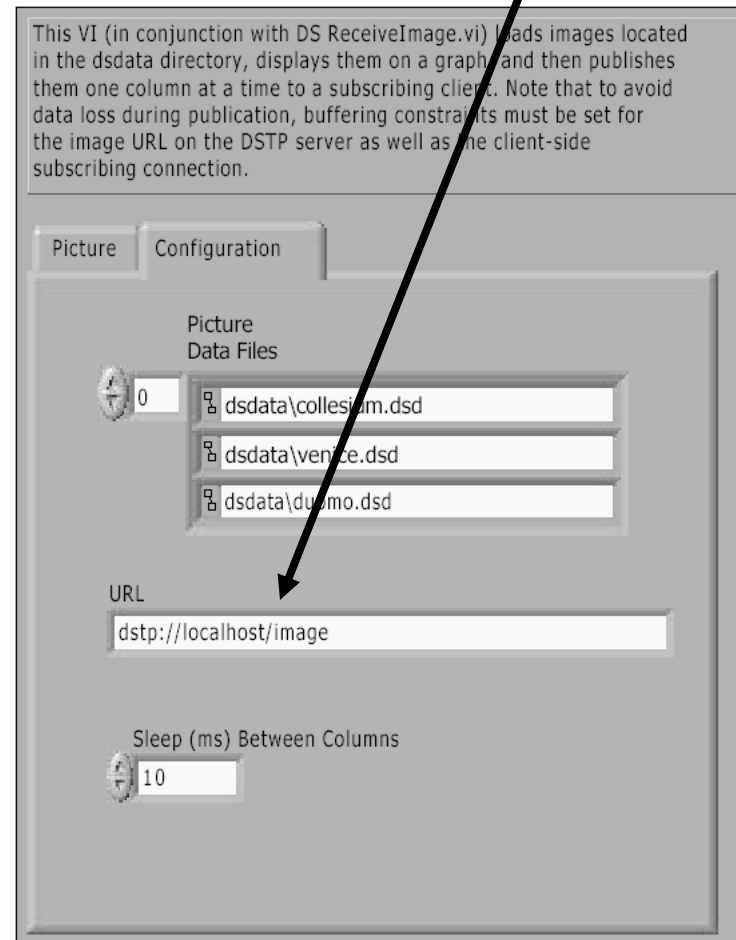
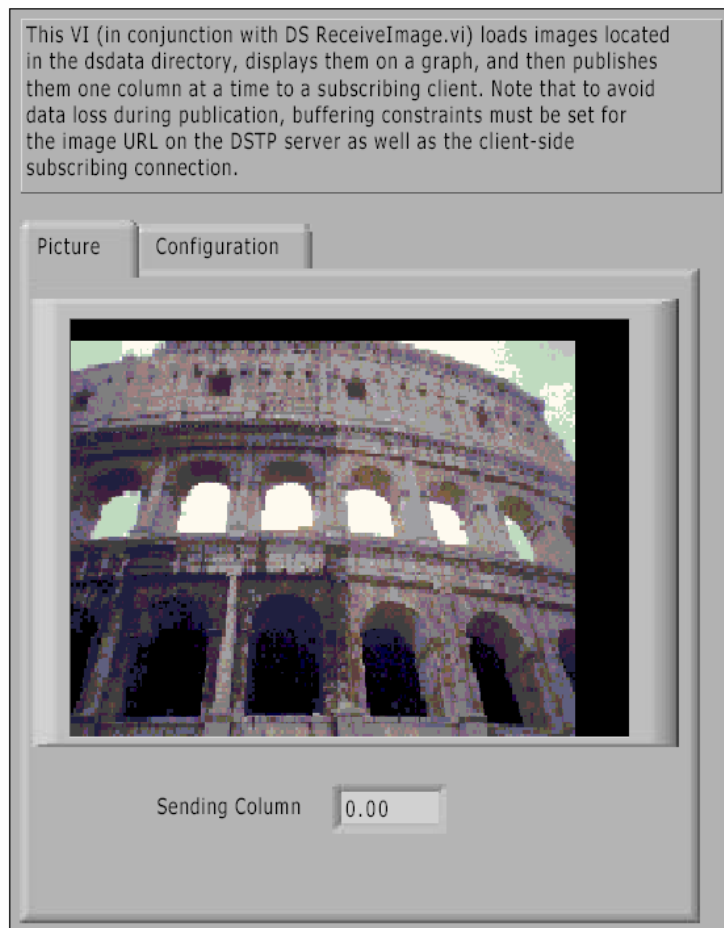
specifying a URL using dstp



Using DataSocket Technology

DataSocket Transport Protocol (dstp)

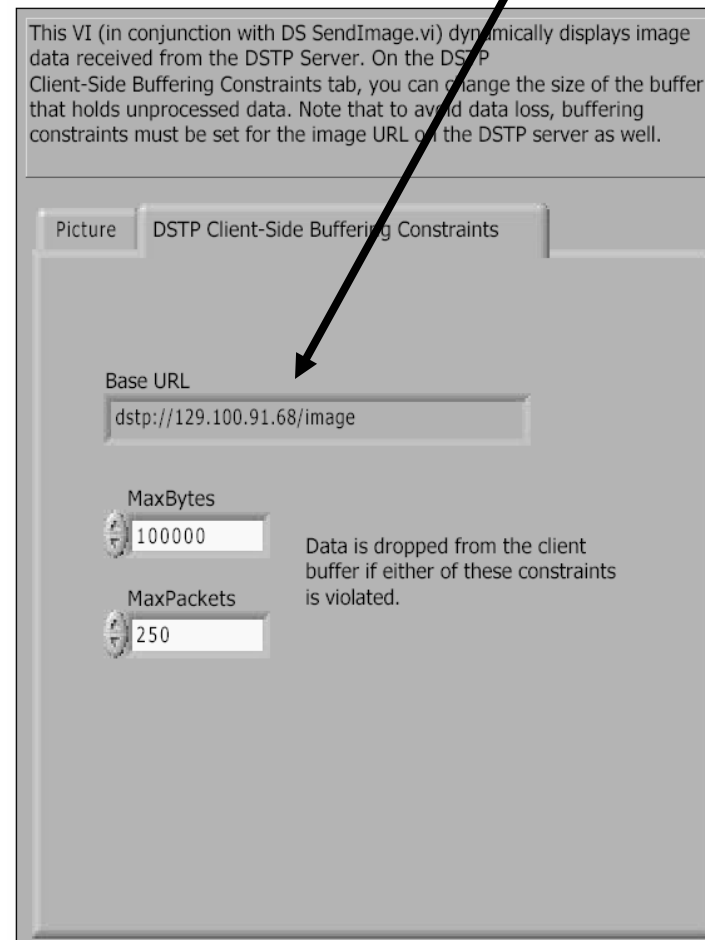
1. Find the VI from **Help»Find Examples...»Search**
2. Type in “**datasocket**” and search
3. Choose **DS SendImage.vi**



Using DataSocket Technology

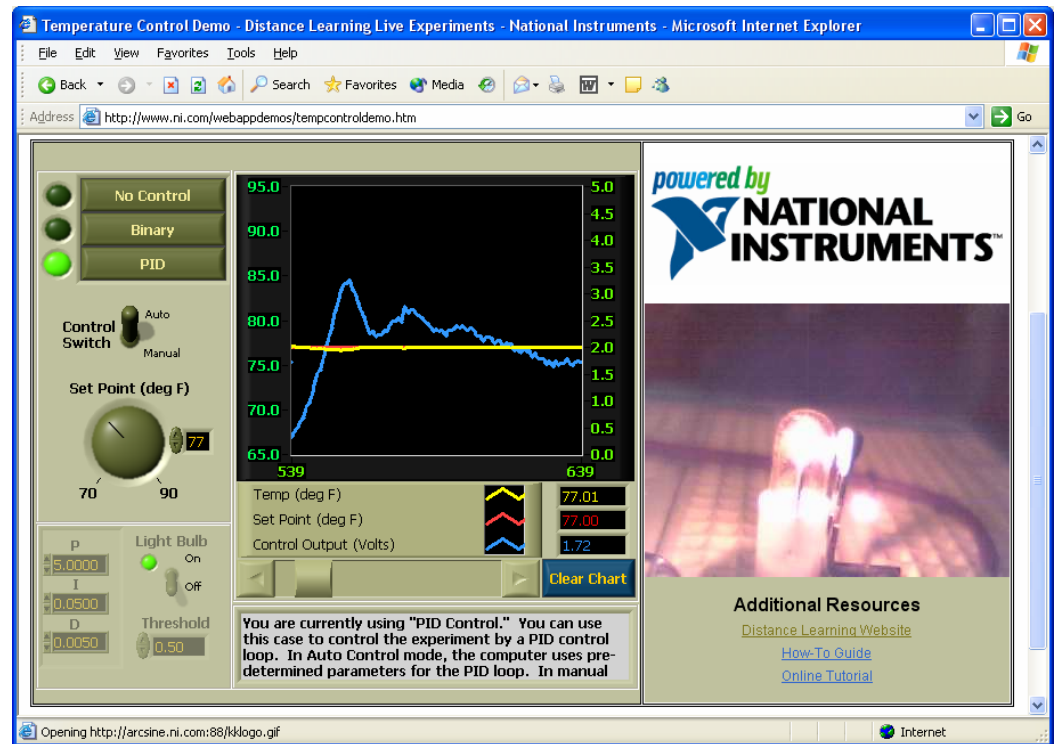
DataSocket Transport Protocol (dstp)

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 these 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. 7

Using built-in web server technology

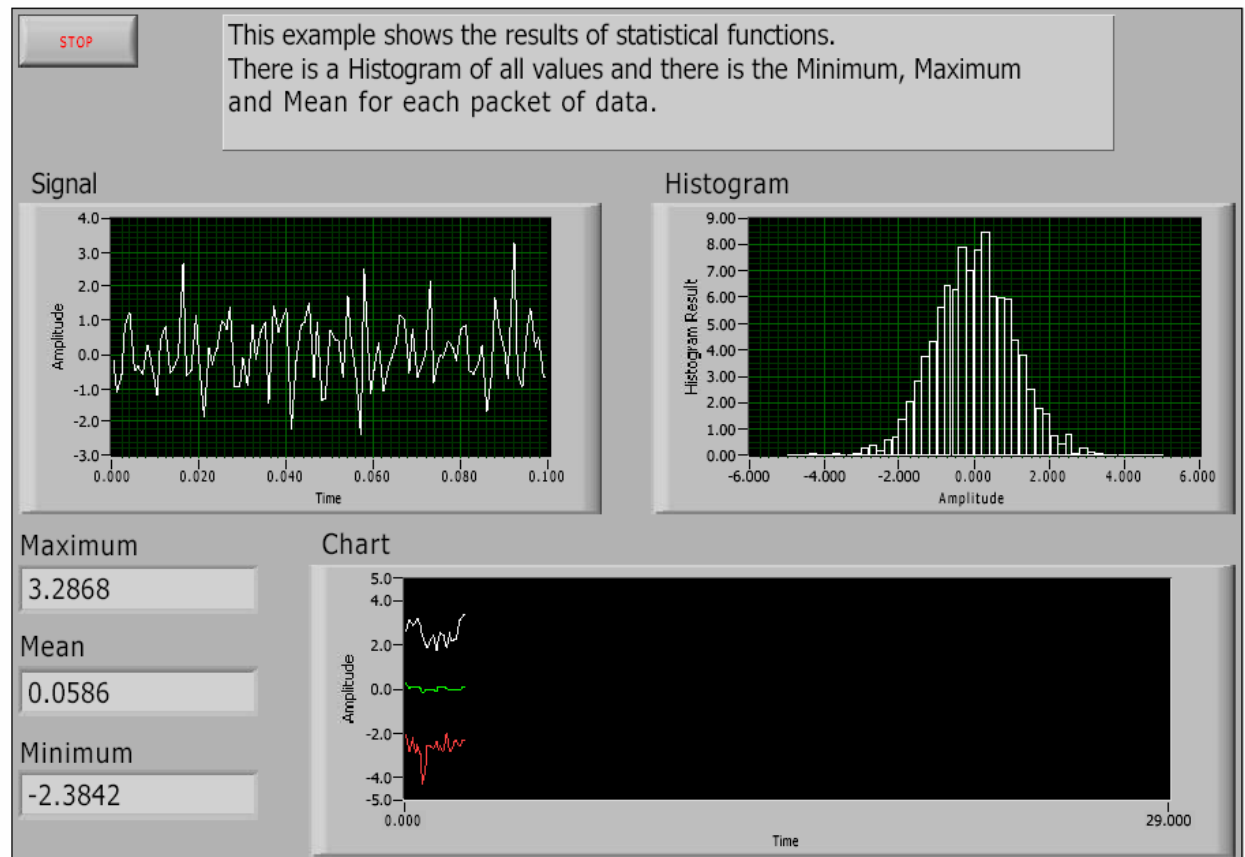
1. Find the VI from Help»Find Examples...»Search
2. Type in “statistics” and search
3. Choose statistics.vi
4. Follow the instructions on last transparency to do the configuration
5. Connect and run

Please practice in a group of 3

Note that the computer name is as following:

NCB1 -->

129.100.101.144

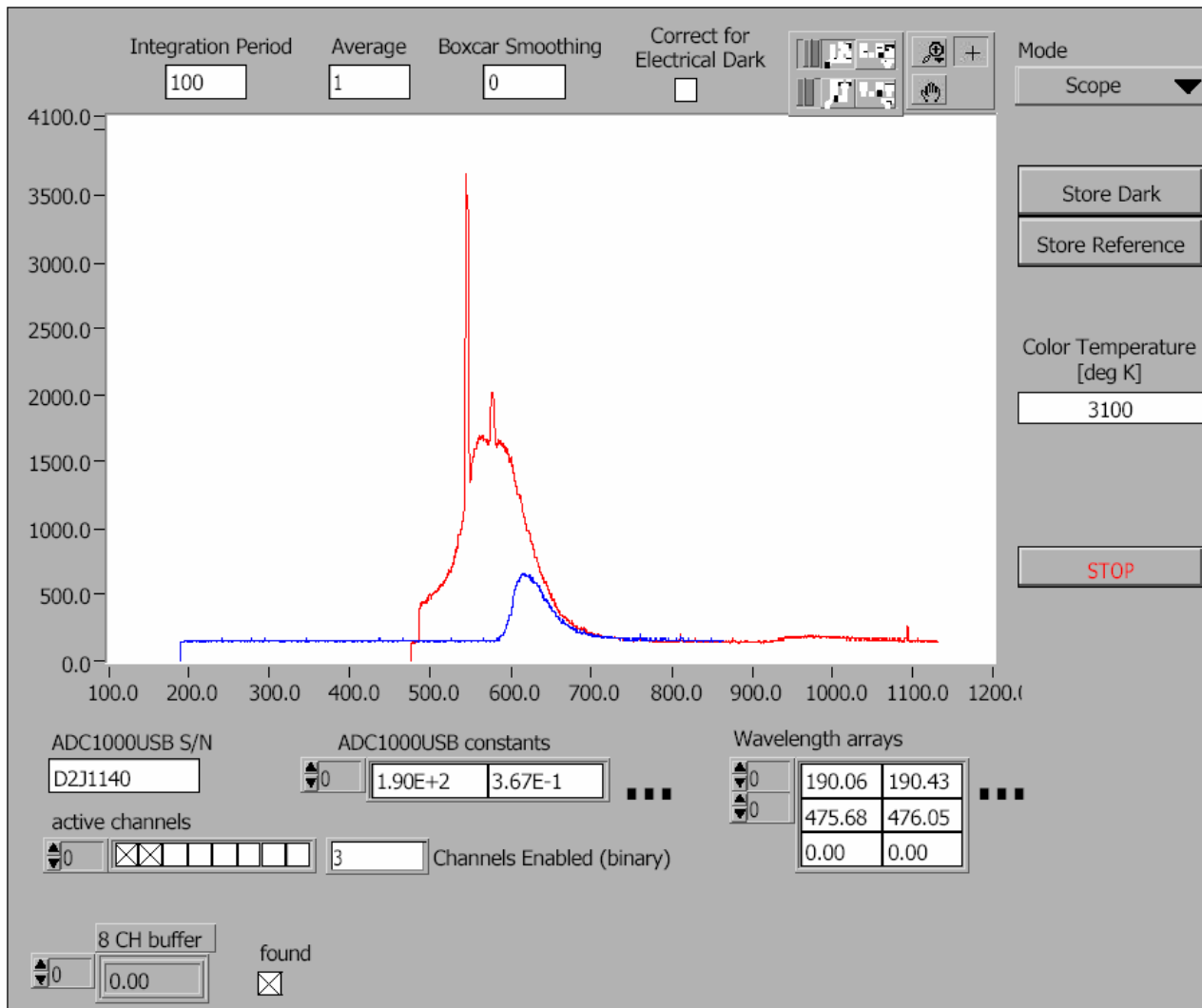


NCB IP addresses

NCB1 129.100.101.144	NCB2 129.100.101.145	NCB35 129.100.101.178
NCB3 129.100.101.146	NCB4 129.100.101.147	NCB36 129.100.101.179
NCB5 129.100.101.148	NCB6 129.100.101.149	NCB37 129.100.101.180
NCB7 129.100.101.150	NCB8 129.100.101.151	NCB38 129.100.101.181
NCB9 129.100.101.152	NCB10 129.100.101.153	NCB39 129.100.101.182
NCB11 129.100.101.154	NCB12 129.100.101.155	NCB40 129.100.101.183
NCB13 129.100.101.156	NCB14 129.100.101.157	NCB41 129.100.101.184
NCB15 129.100.101.158	NCB16 129.100.101.159	NCB42 129.100.101.185
NCB17 129.100.101.160	NCB18 129.100.101.161	NCB43 129.100.101.186
NCB19 129.100.101.162	NCB20 129.100.101.163	NCB44 129.100.101.187
NCB21 129.100.101.164	NCB22 129.100.101.165	NCB45 129.100.101.188
NCB23 129.100.101.166	NCB24 129.100.101.167	NCB46 129.100.101.189
NCB25 129.100.101.168	NCB26 129.100.101.169	NCB47 129.100.101.190
NCB27 129.100.101.170	NCB28 129.100.101.171	NCB48 129.100.101.191
NCB29 129.100.101.172	NCB30 129.100.101.173	NCB49 129.100.101.192
NCB31 129.100.101.174	NCB32 129.100.101.175	NCB50 129.100.101.193
NCB33 129.100.101.176	NCB34 129.100.101.177	NCB51 129.100.101.194
		NCB52 129.100.101.195

Using built-in web server technology

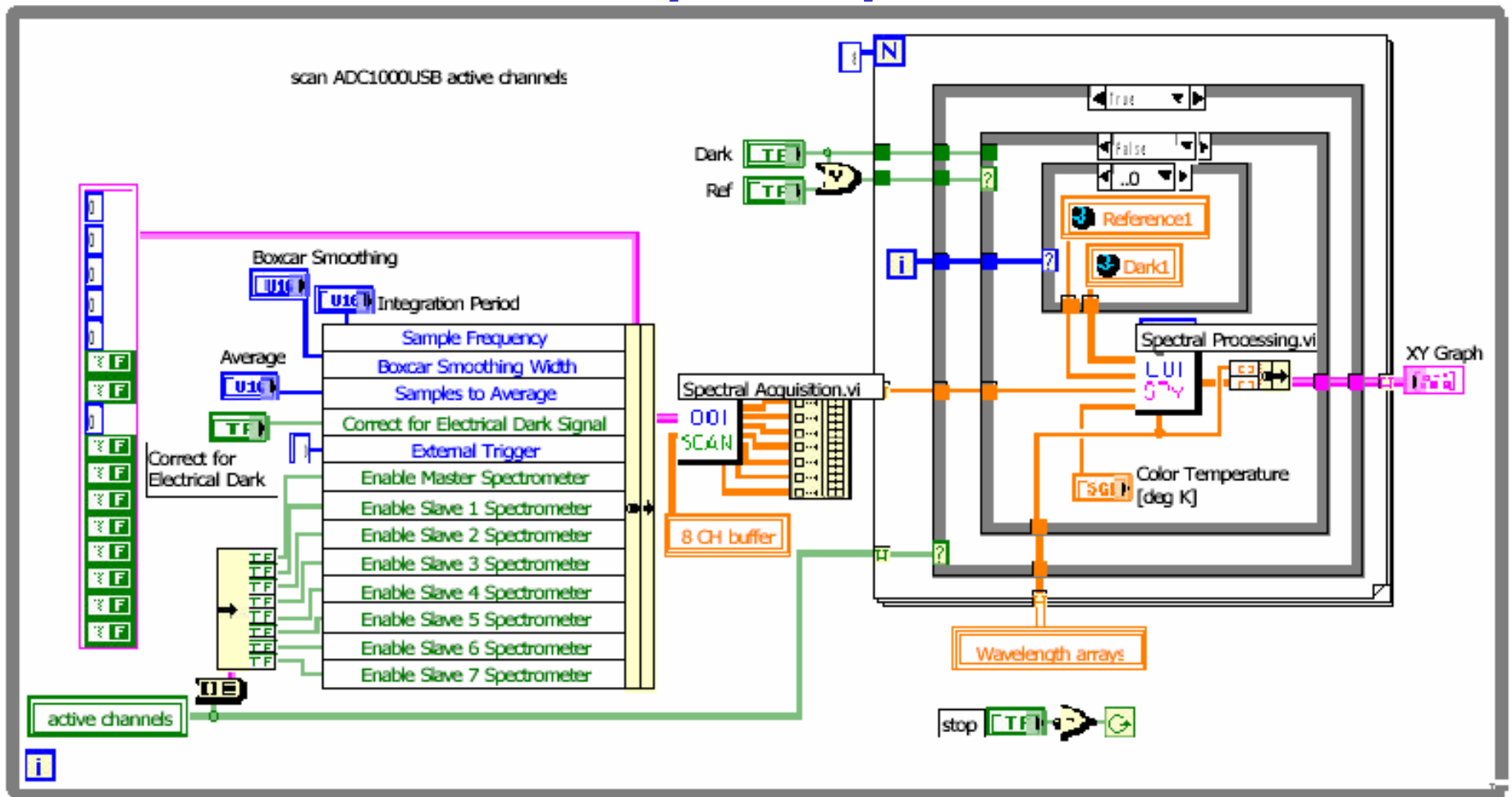
Real remote control to an Ocean Optics spectrometer



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.¹⁰

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**

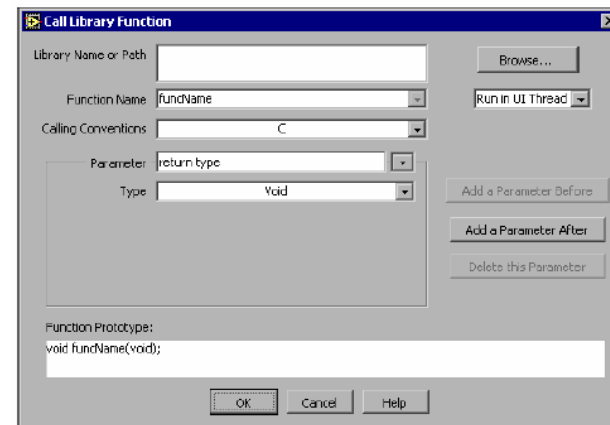
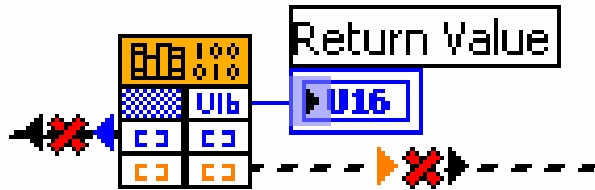
**Is it safe? Yes, the server can disconnect the client anytime
by selecting **Tool>>Remote Pane Connection Manager**.
And the client can not modify the Block Diagram.**

**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.

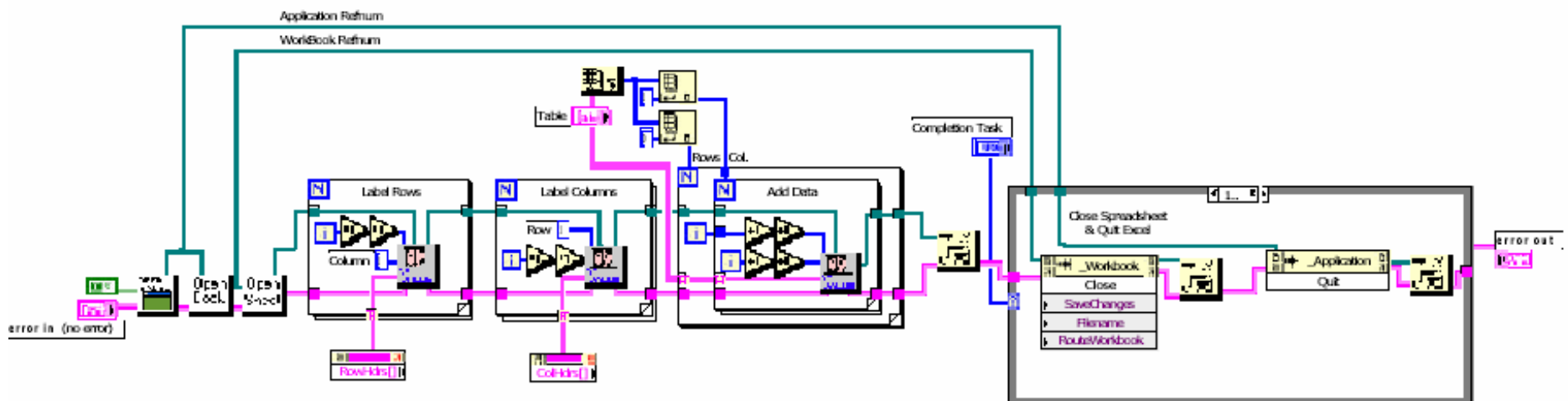
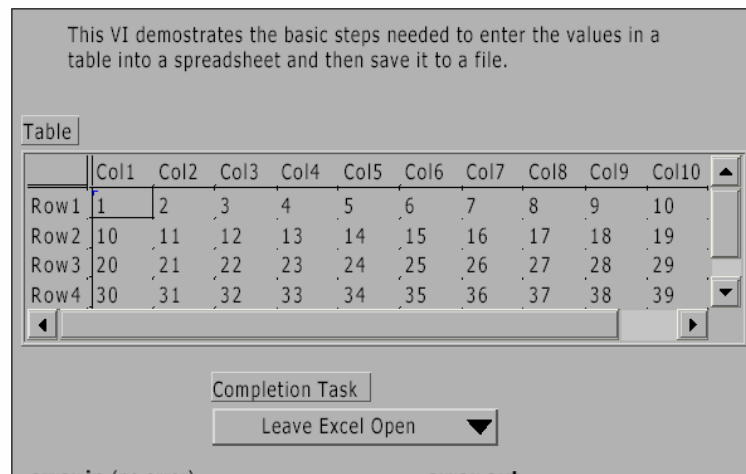
LabVIEW as an ActiveX Client

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.

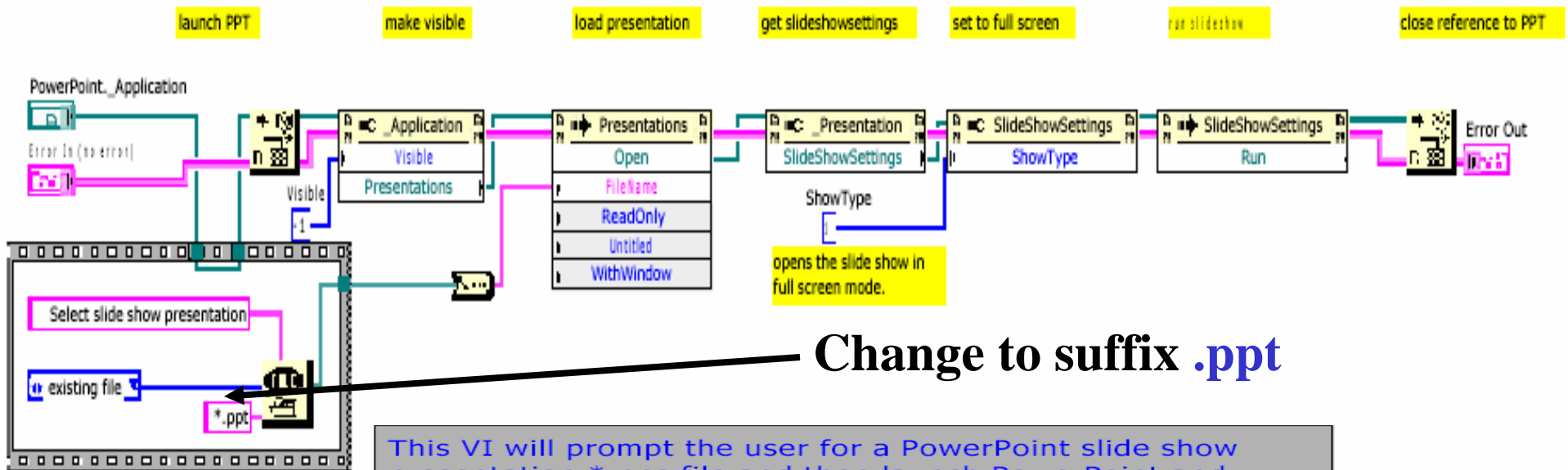
LabVIEW as an ActiveX Client

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



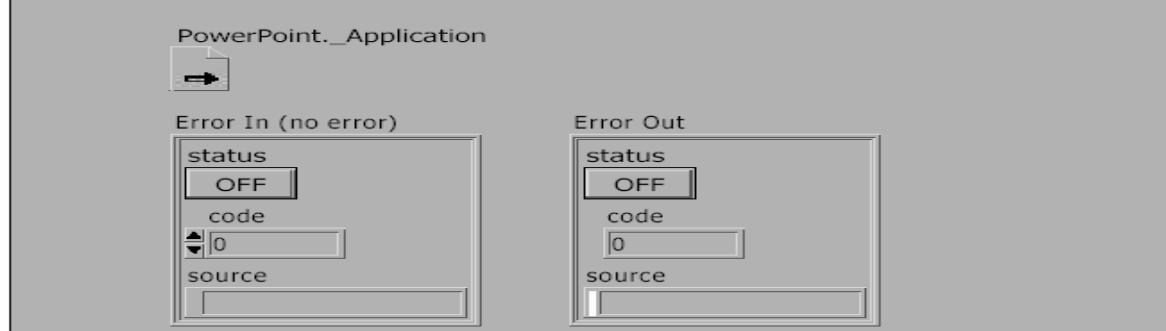
LabVIEW as an ActiveX Client

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

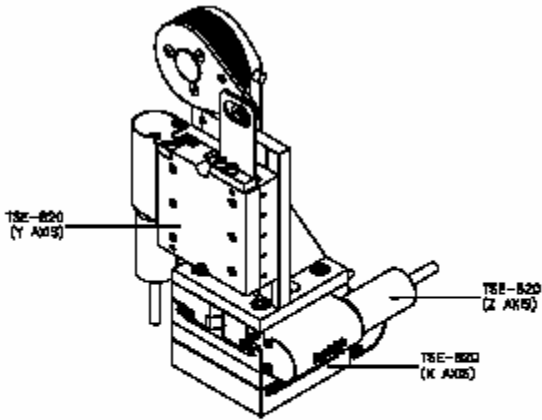


Change to suffix .ppt

This VI will prompt the user for a PowerPoint slide show presentation *.pps file and then launch PowerPoint and run the slide show in a full screen.



LabVIEW as an ActiveX Client



FREEDOM 1500-3, 3-Axis Robot

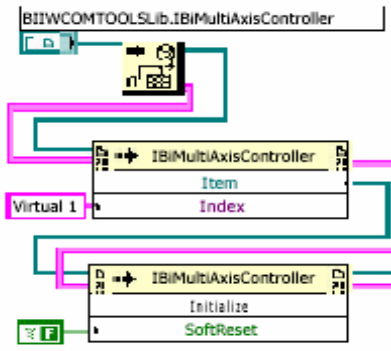


Burleigh's FREEDOM™ 1500 Nano Robot systems with 8200 Inchworm® motor controllers offer automated alignment systems, with 20-nanometer linear resolution.

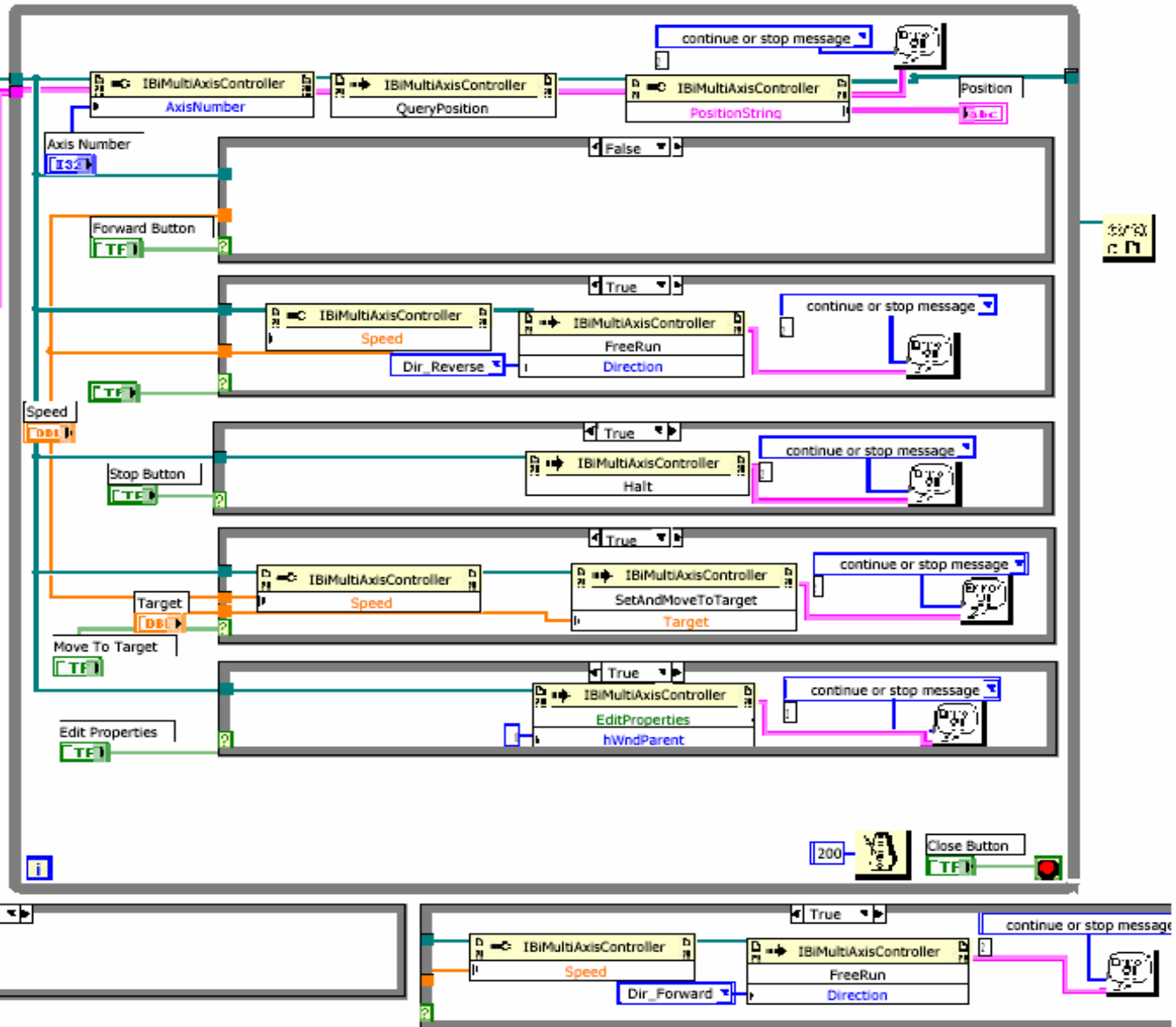
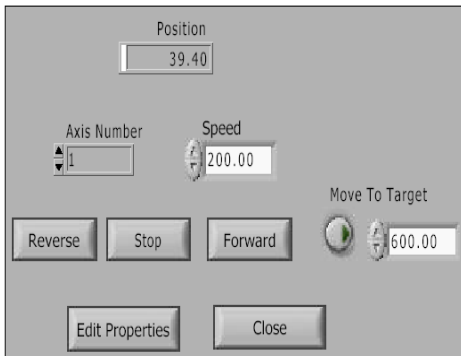
We will use their demo LabVIEW VI (DemoLV.vi) to demonstrate capabilities for both [remote control](#) and [Active X application access](#).

LabVIEW as an ActiveX Client

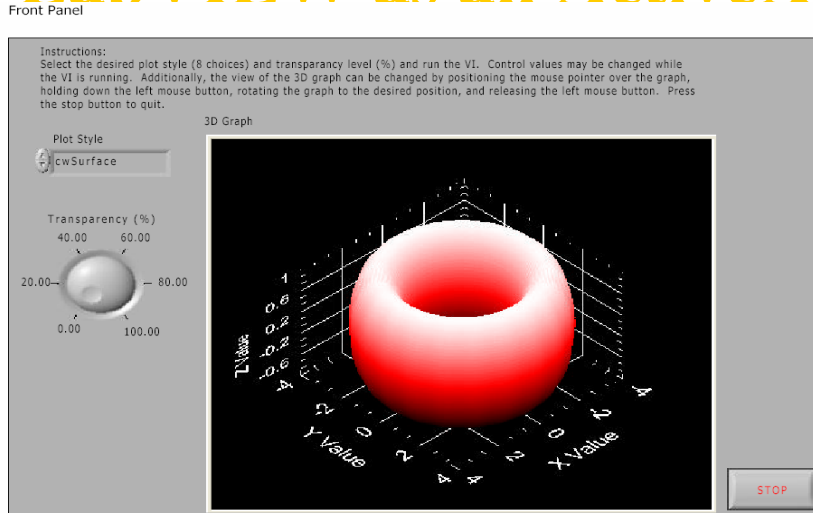
Block Diagram



Front Panel

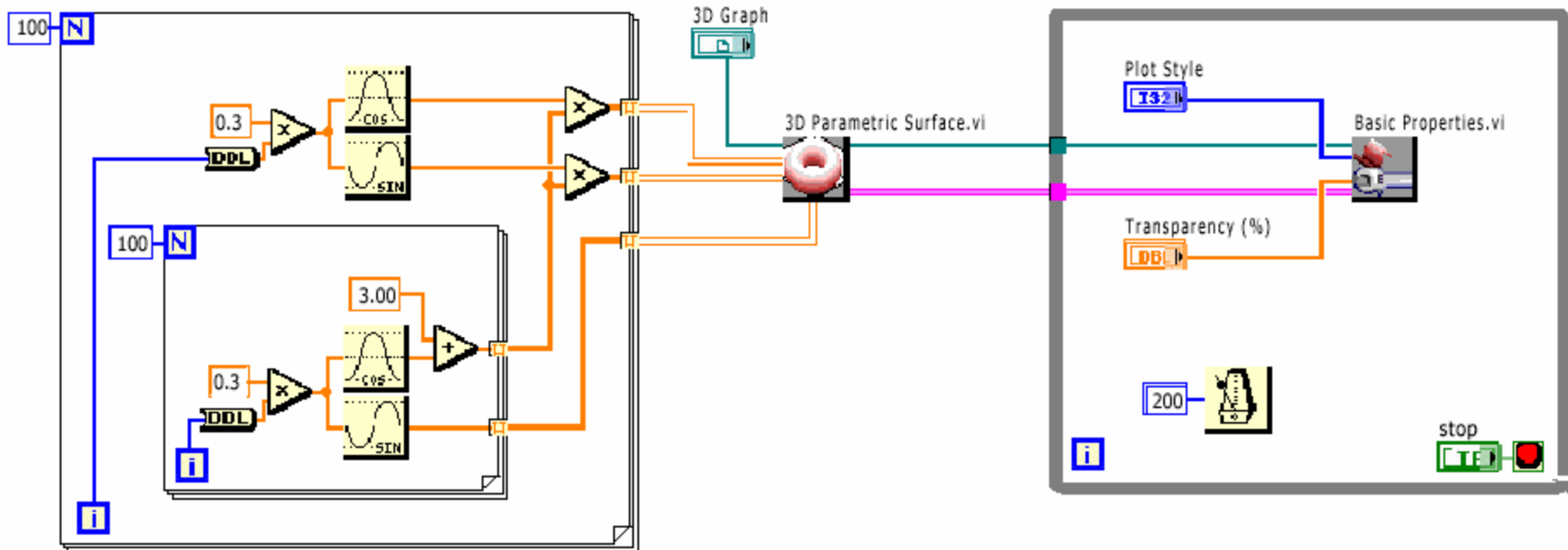


LabVIEW as an ActiveX Client of MS Word



**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.

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.

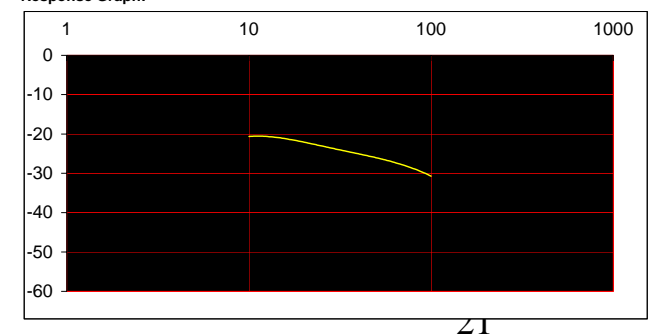
For example, you can embed a VI graph in an Excel spreadsheet and, from the spreadsheet, enter data in the VI inputs and run the VI. When you run the VI, the data plot to the graph. Refer to the examples\comm\freqresp.xls for an example of using LabVIEW properties and methods in an Excel spreadsheet.

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

Frequency Response Demo

Amplitude	10
Number of Steps	100
Low Frequency	10
High Frequency	100

Response Graph:



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.lib.

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.**