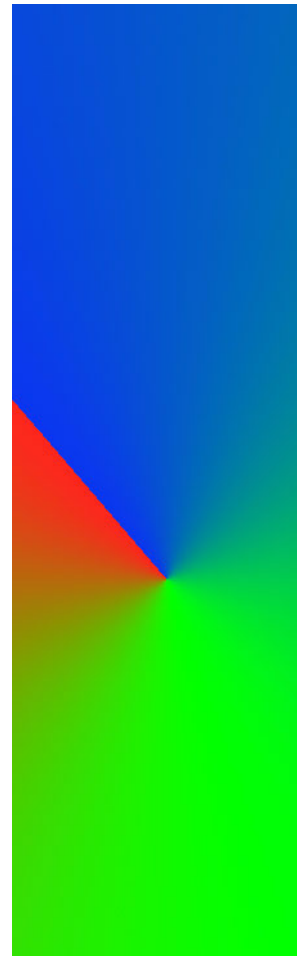# DualView *XL*

User's Guide

RGB

SPECTRUM

DOCUMENT

- DualView XL User Guide

- P/N 350-7948

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- Printed in U.S.A

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NOTICE

COMPANY ADDRESS

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INTRODUCTION

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PRODUCT OVERVIEW

The *DualView XL* is a high performance, compact video *windowing* system that displays live video and / or computer windows on a high-resolution RGB display device. Each of the two windows has three standard inputs and one optional input, but only one input can be displayed at a time in a window.

The following sources can be used as inputs for each window:

- RGB / YP_bP_r component

- Composite video

- S-Video

- DVI (optional)

On your high-resolution display, all types of input sources can be mixed and matched simultaneously, and each input can be independently scaled, positioned panned and zoomed.

Text, graphics and video windows displayed simultaneously

Figure 1-1. *DualView XL* **Displays Two Inputs on a Single Monitor**

The *DualView XL* outputs a high-resolution image, at a user-selected scan rate — up to 1600 x 1200 pixel resolution. Access to all *DualView XL* functions is supported remotely by either RS-232 serial communications or via network control (Ethernet 10/100 BaseT).

SYSTEM FEATURES

The *DualView XL* includes the following standard features and functions:

- **Flexible input channels** — As standard, each input channel accepts NTSC/PAL composite, S-Video, YP_bP_r component (HDTV) or high-resolution RGB signals. Optionally, a digital input module (DVI format) is available for each channel. Full 24-bit color processing is used throughout the system.

Note	HDTV (High Definition Television) input signals can be processed through a channel's RGB/YP_bP_r connector.

- **Window manipulation** — Windows can be positioned, scaled, and clipped to any size or shape desired. Scaling is continuous up to the full size of the display raster. The system also supports zoom and pan within a window and input "freezing."

- **User-defined presets** — *DualView XL* stores and recalls up to ten user-defined presets, each containing information about window size and position, image controls, and image positioning on screen.

- **Remote control** — Complete system control is supported via the RS-232 serial port or the 10/100 BaseT Ethernet port. Many control parameters can be stored in nonvolatile memory for later use,.

- **High-resolution output** — The system's high-resolution analog RGB output (up to 1600 x 1200 pixels) is ideal for use on a computer monitor or a high scan rate projector. The output displays up to two windows simultaneously.

- **Auto sync** — *DualView XL* automatically detects and locks to *all* computer sync signals. Industry standard and custom video timings are supported.

A WORD ABOUT WINDOW INPUTS

Each *DualView XL* window accepts any one of the component, composite, RGB and (optionally) digital inputs. Using control commands, users can dynamically *switch* between any one of the input sources, but the limit of one source per channel remains in effect.

For example, you could connect **RGB** from a PC, **S-Video** from a camera and **Composite** video from a VHS tape deck — all to Window 1's input connectors, and then switch between them using control commands.

Note that because the Component and RGB input signals use the same 15-pin "D" input connector, you can not connect both RGB and component inputs to a given channel simultaneously.

Please note the following important points regarding inputs:

- Video inputs can originate from devices such as TV cameras, video cassette recorders, DVD players or video teleconferencing systems.

- Analog RGB inputs typically originate from a computer. These inputs can be interlaced or non-interlaced, up to 1600 x 1200 pixel resolution, and refresh rates (or frame rate) up to 200 Hz.

- The system's computer inputs can be configured with any sync format (sync on green, composite sync, or separate H- and V-drive).

The figure below illustrates a block diagram of the *DualView XL*, showing the two identical input channels and two identical outputs.
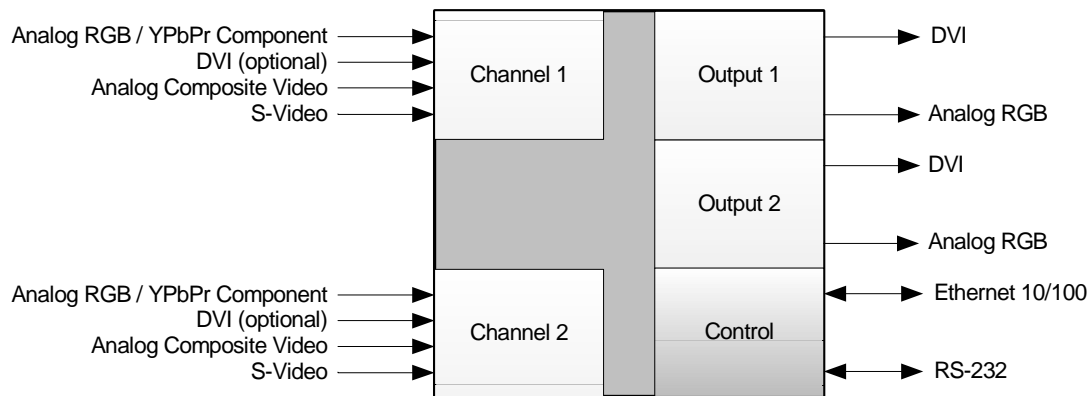
Figure 1-2. *DualView XL* **Block Diagram**

A WORD ABOUT SYSTEM OUTPUTS

As standard, the system provides two identical DVI-I output connectors. Each connector supports both one analog or one digital output. The same image is simultaneously output on both connectors.

All input signals to the *DualView XL* are converted to the selected output resolution (adjustable up to 1600 pixels by 1200 lines), with horizontal scan rates ranging from 12 to 125 kHz.

A WORD ABOUT SCAN RATES

DualView XL specifications state that output resolution is adjustable up to 1600 pixels by 1200 lines, and horizontal scan rates are adjustable from 15 to 125 kHz. However, users should be aware that there are several important constraints to system resolution, including:

- Maximum pixel clock (also known as "sample rate")

- Maximum number of pixels that can be processed

- Maximum number of lines that can be processed

These factors are all *interrelated* with the system's refresh rate (also known as "frame rate"). When configuring your system output, following are a few rules of thumb to keep in mind:

- Sample rate is directly proportional to the product of:

    (# of pixels per line) x (# lines) x (refresh rate)

    Therefore, if a higher refresh rate is desired, the sample rate must be increased. For example:

    ~ A 1600 x 1200 output @ 60 Hz refresh rate requires a pixel clock of 162 MHz — which is equal to the *DualView XL* maximum pixel clock of 162 MHz.

    ~ A 1600 x 1200 output @ 65 Hz refresh rate requires a pixel clock of 175 MHz — which is greater than the maximum of 162 MHz.

- A higher refresh rate can also be achieved by reducing either the # of pixels per line or the # of lines per frame. (Note that the ratio of active pixels per line to the number of active lines is the aspect ratio, typically 4:3 or 16:9.) For example:

    ~ A 1600 x 1200 output @ 85 Hz refresh rate requires a pixel clock of 229.5 MHz — which is greater than the maximum pixel clock of 162 MHz.

    ~ A 1280 x 960 output @ 85 Hz refresh rate requires a pixel clock of 148.5 MHz — which is less than the *DualView XL* maximum pixel clock of 162 MHz.

When configuring your system, the important factor to remember is the *interrelation* between specifications:

- **Yes** — you can adjust your system's output resolution up to 1600 pixels by 1200 lines.

- **Yes** — you can adjust the system's output horizontal scan rate from 12 to 125 kHz.

- **No** — you can not configure resolution at 1600 x 1200 with a refresh rate of 100 Hz — because of the inherent interrelation between factors.

DUALVIEW XL CONTROL

System control for the *DualView XL* is provided via the RS-232 serial port or the 10/100 BaseT Ethernet port. There are no controls on the chassis itself.

- The **RS-232** serial port connects to an ASCII terminal, any computer with a serial port or an external device such as a touchpad. Commands are sent from the terminal or computer to the *DualView XL*.

  Refer to Chapter 5, "**Command Line Interface**" for a complete description of command syntax.

- The **Ethernet** port (10/100BaseT) allows a *DualView XL* system to be connected to a local area network (LAN) or directly to a PC properly equipped with a network card. Note that direct connection requires the use of an Ethernet hub or Ethernet cross-over cable.

FEATURE SUMMARY

Following is a concise summary of *DualView XL* features:

- System:

  - ~ Displays two RGB/video windows simultaneously.

  - ~ Full 24-bit color processing is used throughout.

  - ~ System control via serial RS-232 or 10/100 BASE-T Ethernet.

  - ~ Compact 1RU package.

- Inputs:

  - ~ Supports a wide range of analog RGB inputs with resolutions up to 1600 x 1200 @ 75 Hz frame rate.

  - ~ Supports HDTV / YP_bP_r input with tri-level sync.

  - ~ Optional DVI inputs up to 1600 x 1200 @ 60Hz.

  - ~ Video inputs are selectable between S-Video and Composite formats, in both NTSC and PAL video standards.

- Outputs:

  - ~ Dual output connectors each support DVI and analog signals.

  - ~ Analog RGB output up to 1600 x 1200 @ 75Hz.

  - ~ DVI output up to 1600 x 1200 @ 60Hz.

  - ~ Adjustable output gamma to optimize performance with a variety of display technologies.

  - ~ Output can free run or genlock to input channel 1.

- Special features:

    ~   High quality filtering for window resizing.

    ~   Pan, zoom, border, label and freeze each window.

    ~   Fade output to / from black.

    ~   Fade windows in /out of background

    ~   Colored and shaded backgrounds.

    ~   Export / Import system settings

INSTALLATION AND SET UP

2
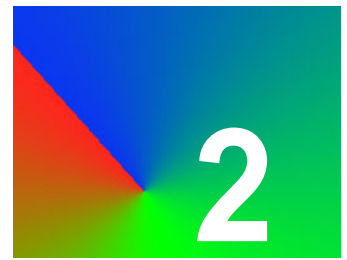
IN THIS CHAPTER

This chapter provides instructions for installing and setting up your *DualView XL* system. The following topics are discussed:

- **Standard Supplied Components**

- **Optional Items**

- **Rack Mounting**

- **Front Panel**

- **Rear Panel**

- **Installation**

- **System Setup**

STANDARD SUPPLIED COMPONENTS

The following equipment is included in the *DualView XL* shipping carton:

Table 2-1.   Standard Supplied Components

Item	Part Number
DualView XL	---
DualView XL User Manual (on CD-ROM)	350-7948
Power cord (110 or 220 volt)	520-1188 or 520-0271-1
DVI - VGA Adapter	520-7885

OPTIONAL ITEMS

RGB Spectrum can optionally provide additional equipment that may be useful in installing and operating the *DualView XL*. The items listed below may be

purchased separately from RGB Spectrum.

Table 2-2.   Optional Items

Item	Part Number	Description
VGA Cable	520-0298-1	15-pin HD Male to 15-pin HD Male, 6 ft. Use to connect your analog output/inputs to sources with a female VGA connector.
VGA-to-BNC Adapter	520-0251-1	15-pin HD Male to a 5 BNC cable bundle Male, 6 ft. 10 inches. Use to connect the analog output/inputs to sources with BNC connectors.

RACK MOUNTING

The *DualView XL* chassis is designed to be mounted in a standard 19" rack. Please note the following important points:

- Ensure that the *DualView XL* is positioned in the rack where the side air intake and exhaust vents are not blocked.

- Rack mount the unit from the front rack ears using four rack screws (not supplied). Rack threads may be metric or otherwise — depending upon the rack type.

- It is typically easier to install the *lower* of the two mounting holes first.

Important	Do not use the *DualView XL* as a shelf to support other pieces of equipment. If you do, the rack ears and mounting screws may be damaged.

- The *DualView XL* is provided with a rear rack bracket and arm to support the rear of the chassis. It is recommended that you use the bracket to provide additional stability.

- Attach the rear brackets to the rack adapter at the rear of your chassis.

- Slide an arm through the slot on the rack adapter and attach the arm to the chassis.

- Attach the arm to the rear bracket by means of the fasteners located in the arms.

FRONT PANEL

The figure below illustrates a front panel view of the *DualView XL*.

Figure 2-1.   *DualView XL* **Front Panel View**
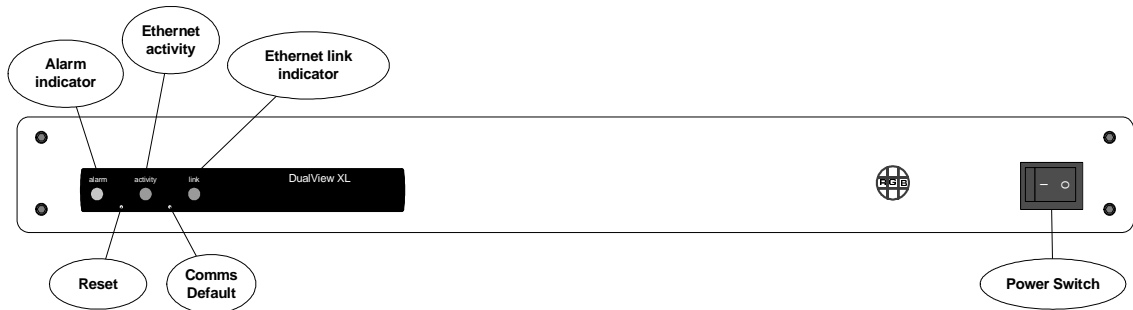
Descriptions of each control and indicator are provided below:

1) **Alarm Indicator LED**

   The Alarm LED glows solid amber when the *DualView XL*'s internal electronics have exceeded the maximum internal temperature of 60 degrees Celsius. Note that this is a warning only, and users should take corrective action to avoid damage to the unit.

2) **Ethernet Activity Indicator LED**

   The Activity LED blinks green when there is data traffic over the *DualView XL*'s Ethernet connection.

3) **Ethernet Link LED**

   The Link LED glows solid green when there is a valid Ethernet connection between *DualView XL* and another Ethernet device. Note that if an RS-232 connection *only* is used, this LED will be off.

4) **Reset Button**

   Press the Reset Button to perform a hard reset. Systems parameters are unchanged (this is equivalent to cycling the power). Use an unfolded paper clip to press the button, located inside the small access hole.

5) **Comms Defaults Button**

   Press the Communications Defaults Button to reset the IP address to the factory default address (192.168.1.200). Use an unfolded paper clip to press the button, located inside the small access hole.

6) **AC Power Switch**

   Use the AC Power Switch to turn the *DualView XL* on and off. When the unit is on, the LED inside the switch glows red.

REAR PANEL

The figure belows shows the *DualView XL* rear panel layout.
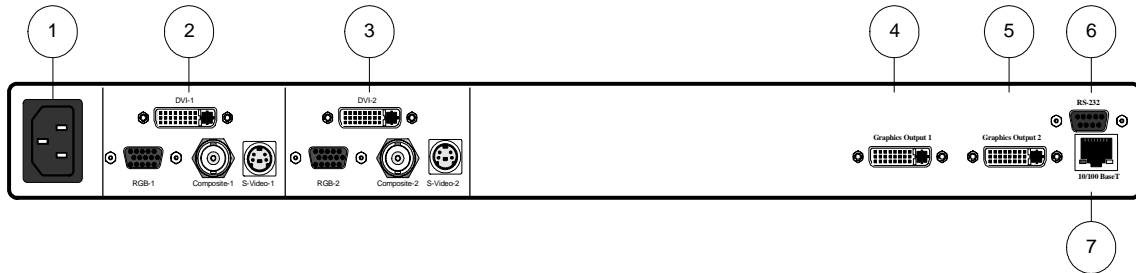
Figure 2-2. *DualView XL* **Rear Panel View**

1)	**AC Power Connector**				
2)	**Input Channel 1**	4)	**Graphic Output 1**	6)	**RS-232 Serial Port**
3)	**Input Channel 2**	5)	**Graphic Output 2**	7)	**Ethernet Port**

Descriptions of each section and connector are provided below:

1) AC Power Connector

One AC Power Connector (IEC 320 three pin) is provided for the system's universal power supply, which operates from any power source with a line voltage in the range of 100 - 260 VAC.

2) Input Channel 1

Upt to four connectors are provided for Input Channel 1, as illustrated and described below. This input supports composite, S-Video, RGB/component, and optionally, DVI signals

NOTE: Click on a connector below to learn more about the connector details.
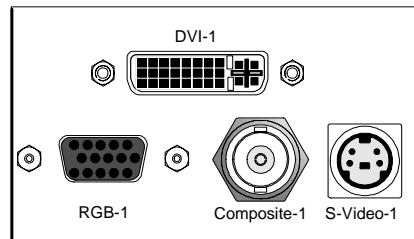
Figure 2-3. Input Channel Connectors

~ **Composite Video** — One BNC female connector is provided for NTSC or PAL composite video, a signal that typically originates from a VCR or camera. An adapter may be required when connecting this input to consumer equipment, which typically uses a phono connector for composite video (professional equipment typically uses BNC connectors).

~ **S-Video** — One 4 pin mini-DIN connector is provided for NTSC or PAL S-Video, a signal that is typically of higher quality than composite video, and originates from many DVD players and cameras. Note that this connector can alternatively be used to connect a second composite input. In this case a special cable will be needed to convert from the mini DIN connector to BNC (or phono) connector that is typically used for composite video signals.

~ **RGB / YP$_b$P$_r$** — One 15 pin female D-sub connector is provided for either high resolution analog RGB input or YP$_b$P$_r$ component video (HDTV). This input supports 3, 4 or 5 wire connections, and is typically used to connect the output of a computer to *DualView XL*.

Note

> Typically, the output of a computer is provided in **RGB** format and connected to *DualView XL* on this input. This input may also be used to connect HDTV signals, which can originate in **RGB** or **YP$_b$P$_r$** formats.

~ **Digital** — One DVI-I connector is used for the optional digital input, typically used to connect an external computer graphics output to the *DualView XL*.

3) **Input Channel 2**

Four connectors are provided for Input Channel 2. See the "**Input Channel 1**" description on the previous page for details.

.

Note

> The input channels are configured identically. All inputs are self terminating.

4) **Graphic Output 1**

One DVI-I multi-pin connector is provided for Graphic Output 1, which provides both analog and DVI output signals on the same connector. Each output's *image* is identical. Using the proper cable (customer supplied), you can connect this output to a DVI-capable monitor or an analog RGB monitor.

5) **Graphic Output 2**

One DVI-I multi-pin connector is provided for Graphic Output 2, which is identical to Graphic Output 1.

6) **RS-232 Serial Port**

One 9 pin female D-Sub connector is provided for local RS-232 control from an external device.

Please note:

~ Use this connector when the controlling device is physically close to *DualView XL* and control across a network is not required.

~ Connection to a PC, external controller or serial terminal can be made using this connector.

7) Ethernet Port

One 10/100 Base-T Ethernet (RJ-45 connector) is provided for over a network or from a local computer using peer to peer communication. Using a standard Ethernet cable, you can connect directly to a local area network (LAN). Use this port when control over a network is a requirement.

Note

> *DualView XL* can be controlled by using either the RS-232 port or the 10/100 Base-T Ethernet port. Both can be connected at the same time.

CONNECTOR SUMMARY

The table below summarizes the connectors types. For more information refer to **Appendix C**

Table 2-3. Connector Types

Connector	Physical Type	Gender
Composite video input	BNC	Female
S-Video input	4-pin mini-DIN	Female
RGB / YP_bP_r input	15-pin HD D-Sub	Female
Digital input (optional)	DVI-I	Female
Graphic Output	DVI-I	Female
RS-232 Serial	9-pin D-Sub	Female
Ethernet 10/100 Base-T	8-pin RJ-45	Female

INSTALLATION

This section provides *DualView XL* installation instructions. All connections are made to the rear of the chassis. Refer to for the location of each connector.

Note	Ensure that the *DualView XL* is rack mounted before continuing. If not, refer to "**Rack Mounting**" (page 8) for instructions.

Use the following steps to install the *DualView XL*:

1. **Connect Power** — Connect a power cord to the AC Power Connector. The *DualView XL* is equipped with a universal, 100-264 V, 50-400 Hz power supply.

2. **Connect Inputs** — Connect the desired video and/or computer sources to input channels 1 through 2.
   Note:

   ~   For a channel's composite input, use a standard BNC cable.

   ~   The S-video input can be used to connect an S-Video signal **or** an additional composite video signal.
   To connect an S-Video signal, use a standard 4 pin mini-DIN S-Video cable.
   To connect a composite video signal you will need to use a mini-DIN to BNC or mini-DIN to phono adapter cable and connect the composite video signal to the 'Y' channel.

   ~   For a channel's RGB / YP_bP_r input, use a standard VGA cable with a 15 pin male D-sub connector. The *DualView XL*'s input connector will support 3, 4 or 5 wire connections. In Appendix B, refer to the "**High Resolution Analog Connector**" section for pinout information.

   ~   For a channel's optional digital input, use a standard DVI cable. In Appendix B, refer to the "**DVI-I Connector**" section for pinout information.

   Remember that multiple sources can be connected simultaneously to each input (composite, S-Video, RGB and digital), but only one input can be shown in a window at a time. You can choose which of these sources to display on a given window by using the "**INputSouRCe**" command, or directly from the Web Control panel.

   Refer to Chapter 5, "**Command Line Interface**" for a complete description of *DualView XL* commands.

3. **Connect Graphic Output(s)** — Using a DVI-I interconnect cable, connect Graphic Outputs 1 and 2 to the desired destination displays. Remember that each output connector supports both analog and DVI output signals. With a standard DVI interconnect cable, you can connect directly to a DVI capable monitor.

~   If you wish to connect to a monitor with an analog RGB input, you will need to use an adapter which converts from the DVI connector directly to a 15 pin D-sub connector. This adapter is provided as a standard item with your *DualView XL.* As an alternative, standard cables are readily available to convert from the DVI connector to either 15-pin D connectors or BNC connectors.

The two Graphic Output connectors provide both analog and digital outputs simultaneously providing the ability to have two digital outputs, two analog outputs, or a combination of digital and analog output.

In Appendix B, refer to the "**DVI-I Connector**" section for detailed wiring instructions for the Graphic Output connectors.

Note

Analog display devices must be able to accept RGB inputs of at least 15 kHz.

4. **Select a Control Method** — either via an RS-232 serial connection or via an Ethernet connection:

~   **Serial Control** — To control *DualView XL* using a terminal emulation program (such as Hyperterminal or Procomm), connect the COM port of your computer (or other terminal control device) to *DualView XL*'s RS-232 serial port. This enables you to control the *DualView XL* using ASCII commands. A straight through cable (typically 9 pin male to female with one-to-one wiring) will be required.

In Appendix B, refer to the **RS-232 Connector** section for advanced information on RS-232 connection parameters.

Please continue with the "**System Setup**" section.

~   **Ethernet Control** — To control the *DualView XL* over a network, connect an Ethernet cable (from your LAN, Ethernet hub or switch) to the *DualView XL*'s 10/100 Base-T Ethernet port. This method allows you to use a Telnet session or a standard web browser to access *DualView XL*'s internal Web Control Panel. Ethernet is also ideal for controlling *multiple DualView XL*s, eliminating the need to daisy-chain units.

Note

A PC can be connected *directly* to the *DualView XL*'s Ethernet port, without being connected to a network. For this "direct connect" method, use an inexpensive Ethernet hub or an Ethernet cross-over cable. In Appendix B, refer to the **Ethernet Connector** section for pinout details.

Please continue with the "**System Setup**" section.

SYSTEM SETUP

The following topics are discussed in this section:

- **Communications Alternatives**

- **Timing Adjustments**

Note	Before applying power, make sure that all cables are connected correctly and that the *DualView XL* power switch is in the **OFF** position. With all cables properly connected, turn the *DualView XL* **ON**.

COMMUNICATIONS ALTERNATIVES

The communications setup procedure consists of setting up an external device to communicate with the *DualView XL*. This can be accomplished using one of three control methods:

- **RS-232 Control** — This method uses a command line interface to control *DualView XL* through a terminal emulation program. Refer to the following "**RS-232 Serial Control Setup**" section for instructions.

- **Telnet Control** — Telnet control provides a command line interface to the *DualView XL* using the 10/100 BASE-T network port. Operationally, this interface is almost identical to RS-232 control, but the setup procedure is different. Refer to the "**Telnet Control Setup**" (page 19) section for instructions.

- **Web Control Panel (WCP)** — This method uses a graphical interface through *DualView XL*'s internal web server, via Ethernet. Two setup procedures are required:

  - ~ **Telnet Control Setup**

  - ~ **Web Control Panel Setup**

Once communications have been established with one of the above methods, you will be able to adjust all *DualView XL* system parameters.

Refer to Chapter 5, "**Command Line Interface**" for a complete description of *DualView XL* commands.

RS-232 SERIAL CONTROL SETUP

The RS-232 serial control method uses an ASCII terminal or a PC running a terminal emulation program (such as HyperTerminal or Procomm) to communicate with the *DualView XL*.

Use the following steps to connect and control via RS-232:

1. Ensure that the *DualView XL*'s RS-232 Serial Port is connected to the COM port of your computer (or other terminal control device), as outlined in the "**Installation**" section.

2. On your PC, launch Hyperterminal by clicking **Start > Programs > Accessories > Communications > Hyperterminal**.
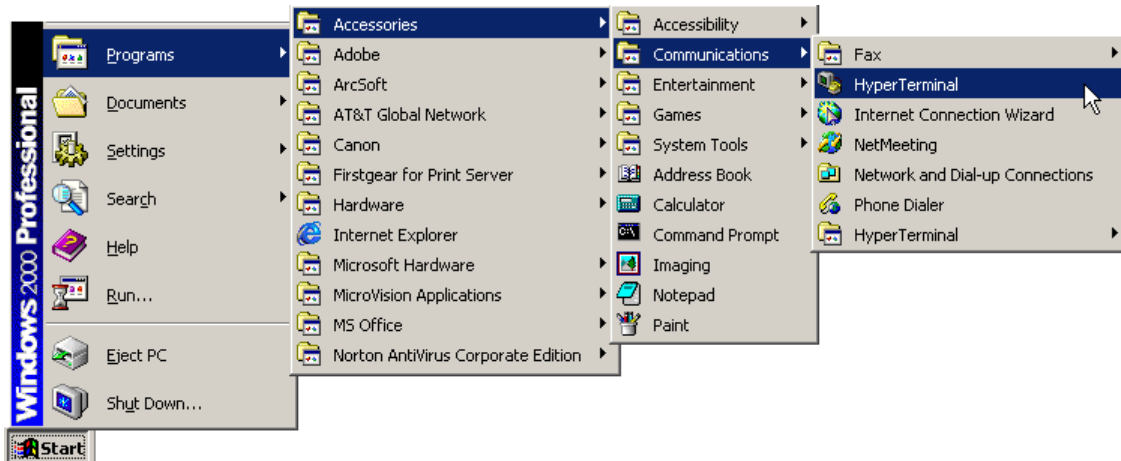
Figure 2-4. Hyperterminal Path

This action displays the **Connection Description Dialog**, a sample of which is shown below.
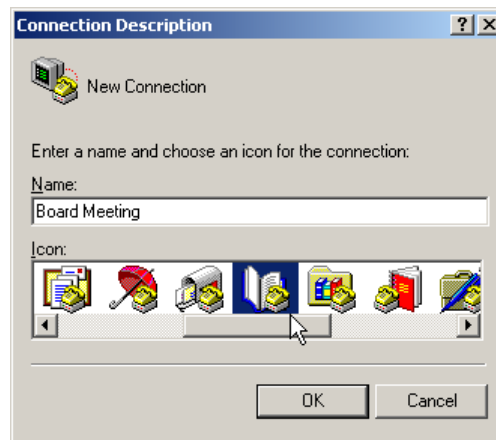
Figure 2-5. Connection Description Dialog (Sample)

3. In the dialog, enter a name, choose an icon and click **OK** to display the **Connect To Dialog**.

Figure 2-6. Connect To Dialog (Sample)

4. In the **Connect To Dialog**, ignore the **Country**, **Area Code** and **Phone Number** fields. In the **Connect Using** field, select your PC's COM port to which the serial cable from *DualView XL* is connected.

5. Click **OK** to display the **COM Properties Dialog**.
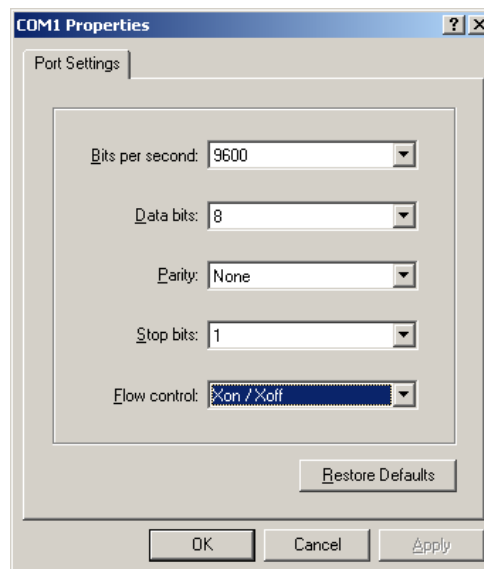
Figure 2-7. COM Properties Dialog (Sample)

6. Configure your PC to match the *DualView XL*'s pre-configured factory settings, as follows:

~ Bits per second (baud): **9600**

~ Data bits: **8**

> ~   Parity: **None**
>
> ~   Stop bits: **1**
>
> ~   Flow control: **XOn / XOff**

DualView XL can be configured to operate at baud rates from 9600 baud to 115 kbaud. In Chapter 5, refer to the "**Serial Port Commands**" section for details about changing baud rates.

7. Click **OK** to display the Hyperterminal window.

8. Select the "phone" icon to connect the PC to the *DualView XL.*

9. When the window is open press the ENTER key.
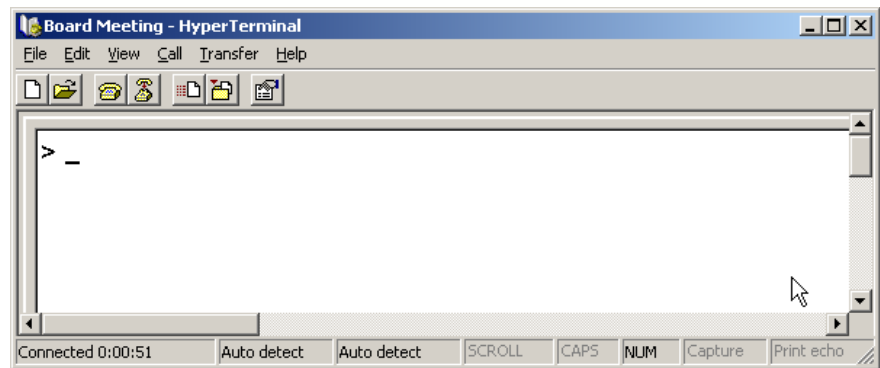
Figure 2-8. Hyperterminal Window (Sample)

Please note:

> ~   If a prompt is displayed in the window (as shown above), your PC is successfully connected to *DualView XL.*
>
> ~   If you do not see a prompt (or any characters), there is a connection problem. Refer to Chapter A, "**Firmware Updates and Troubleshooting**" for basic troubleshooting steps.

10. If a prompt is displayed in the Hyperterminal window, you can test out the system. Type:

```
HELP
```

... and press **Enter**.

> ~   If communications have been set up correctly, *DualView XL* responds with a list of available commands.
>
> ~   If *DualView XL* does not respond, refer to Chapter A, "**Firmware Updates and Troubleshooting**."

Refer to Chapter 5, "**Command Line Interface**" for a complete command list.

TELNET CONTROL

SETUP

The *DualView XL* can be controlled using a command line interface via the Ethernet port. This provides the ability to control the device locally (peer to peer) or over a LAN connection.

When connecting systems via Ethernet, the setup of communications parameters is automatic. However, because this is a *network* connection, a unique address (known as the **IP address**) must be set up.

For proper setup, *DualView XL* requires a *fixed* IP address (also known as a "static" IP address). At the factory, *DualView XL* is programmed with a default IP address, but this address must be changed if you want to use your *DualView XL* on a network.

Important	Consult your network administrator to obtain a valid IP address before commencing the network setup procedure.

▲ **Recommendation:** If you intend to use *DualView XL* directly on a Local Area Network (LAN), change the unit's IP address before putting it on the network. This can be accomplished one of two ways:

   ~   Use the serial port to change the IP address (**IPADDRess** command). Refer to the "**IP Address Setup via Serial Port**" section below for details.

   ~   Connect *DualView XL* directly to a PC using the *DualView XL*'s Ethernet port. Refer to the "**IP Address Setup via the Ethernet Port**" in the following section for details.

IP ADDRESS SETUP VIA SERIAL PORT

Use the following steps to change the *DualView XL*'s IP address using the serial port:

1. Connect the *DualView XL* as outlined in the "**RS-232 Serial Control Setup**" (page 15) section.

2. With communications established, type:

    ```
    IPADDR
    ```

    ... and press **Enter**.

    DualView XL should respond with the current IP address. Make a note of the address before proceeding with the next step.

3. Type `IPADDR` followed by a space and the new IP address provided to you by your network administrator.

▲ **Example:** If the new IP address is to be 192.168.100.15, type:

    ```
    IPADDR 192.168.100.15
    ```

    ... and press **Enter**.

4. *DualView XL* should respond with the following message:

    ```
    The system must be restarted for your changes to
    take effect. Do you want to restart the system
    ```

```
(y/n)?
```

~   Press "**y**" to restart *DualView XL* and use the newly assigned
    IP address.

~   Press "**n**" to retain the *current* IP address, and discard the new
    address.

5. Confirm the new setting by typing the command `IPADDR`. If the
    DualView XL has accepted the command, it responds with the new IP
    address that you just entered.

Once you have set the IP address you can connect to the Ethernet port from
your PC. See the following section for details of starting a telnet session.

IP ADDRESS SETUP VIA THE ETHERNET PORT

The previous section detailed a method to set the *DualView XL*'s IP address
using the serial port. As an alternative you can set the IP address directly from
the Ethernet port using a telnet terminal. Note: this section is not necessary if
you have set the IP address using the method described in the previous section
(**IP Address Setup via Serial Port**).

Use the steps in this section to change the *DualView XL*'s IP address using the
Ethernet port. A telnet session provides the ability to remotely log into a
computer. The *DualView XL* is provided with an internal telnet server which
will work with standard telnet clients. A telnet client is included as a standard
item with Windows operating systems.

It is recommended that you set up the *DualView XL* by initially connecting
directly to a PC and *not* connecting via the network. This will avoid potential
conflicts between *DualView XL*'s default IP address and your network.

The following procedure assumes that you have this direct connection between
PC and *DualView XL*.

Use the following procedure to set up the IP address via Telnet:

1. Use an Ethernet crossover cable to connect directly between the *Dual-
    View XL*'s Ethernet port the network port of your PC.

2. Open a web browser window (Internet Explorer recommended) on
    your PC.

3. Delete your default address in the browser window address line.

4. In the browser address line type:

    ```
    telnet://<ipaddress> 8000
    ```

    where <ipaddress> represents the current IP address of your *DualView
    XL*

▲   Example - if you have not previously changed the default address of
    the *DualView XL* it should be set to the following IP address:

    ```
    192.168.1.200
    ```

Assuming the default IP address shown above in your web browser address line type the following:

`telnet://192.168.1.100 8000`

... and press **Enter**.

At this point, the telnet terminal window should start and *DualView XL* should respond with the product name and copyright notice as shown in the following figure.
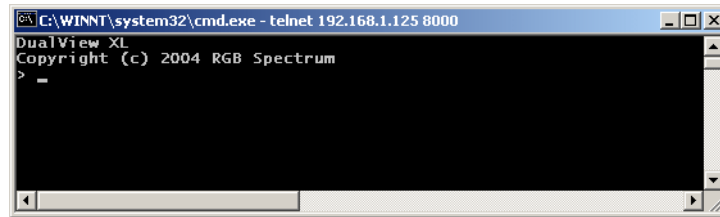
Figure 2-9. *DualView XL* **Login (Sample)**

5. To obtain a complete list of IP address settings and confirm connection, in the telnet window type the command:

   `ID`

   ... and press **Enter**. *DualView XL* should respond with product details including the other IP settings.

6. To change the current IP address, in the Command Window, type `IPADDR` followed by the *DualView XL*'s new IP Address (as provided by your network administrator).

▲ **Example:** If the new IP address is 192.168.100.15, type:

   `IPADDR 192.168.100.15`

   ... and press **Enter**

   The *DualView XL* will respond with the following message:

   `The system must be restarted for your changes to take effect.`

   `Do you want to restart the system (y/n) ?`

   Type "y" to accept the new address, or "n" to retain the current address.

Important | When you change the IP address from the ethernet port, the telnet connection will be lost and you will lose communication. This behavior is to be expected. Simply restart the telnet session using the new IP address (see Step 4).

7. If you pressed "**y**" in the step above, *DualView XL* will restart and the Telnet connection will be lost. Repeat steps 2 through 4 to establish a new Telnet session, except in step 4, type the <u>new</u> IP address.

8. Confirm the new setting by typing the command `IPADDR` and press **Enter**. If the *DualView XL* has accepted the command, it will respond with the new IP address.

9. You have now set up the new IP address. You have also set up a new telnet session and can control the *DualView XL* directly by issuing ASCII commands from the telnet terminal. Refer to Chapter 5, "<u>**Command Line Interface**</u>" for a complete command list.

Note	To close a Telnet session, type `EXIT` or use the keystroke sequence "**Control + D**."

Please note:

*   If you will be controlling *DualView XL* via Telnet, please continue with the "<u>**Timing Adjustments**</u>"section (page 23) .

*   If you will be controlling *DualView XL* via the system's internal web browser, please refer to the next sectio and Chapter 4, <u>**Web Control Panel**</u>.

WEB CONTROL PANEL SETUP

DualView XL's Web Control Panel (WCP) interface provides a graphical alternative to the "command-based" setup and control used with serial control. This method uses the *DualView XL*'s internal Web Server, allowing you to set up and operate the system from a standard browser.

▲ Please note the following important recommendations:

*   To minimize compatibility issues between browsers, it is recommended that you use the Internet Explorer® web browser.

*   To use *DualView XL* on your LAN (Local Area Network), ensure that the *DualView XL* has an IP address that is compatible with your LAN.

*   Changes to the default IP address should be made before putting your *DualView XL* on the network. Refer to the "<u>**Telnet Control Setup**</u>" section (page 19)for complete instructions.

*   Connect to the *DualView XL* using your web browser by typing the *DualView XL* IP address into the browser address box.

▲ Example: If your *DualView XL* IP address is 192.168.1.200 type the following into your browser address box:

```
http://192.168.1.200
```

... and press **Enter**

Refer to Chapter 4, <u>**Web Control Panel**</u> for more information on using the WCP.

**TIMING
ADJUSTMENTS**

For best results, the timing parameters of a signal must match the display device. Please note:

- For the *DualView XL* output, the output settings should be set to match the display.

- For the *DualView XL* graphics inputs, the *DualView XL* input settings should match the characteristics of the input signals.

DualView XL system timing consists of two procedures:

- **Output Timing**

- **Input Timing**

The output timing procedure should be performed first, followed by the input timing procedure.

OUTPUT TIMING

The **Output Timing** procedure enables you to match the *DualView XL*'s output signal to the graphic display device(s) that you are using. *DualView XL* generates a wide range of preset VESA-compliant output formats, and also enables users to define custom values.

The overall procedure has three parts:

- Learn the characteristics of your display device.

- Load the required output format using the **Output Timing Load** function.

- Use your display's controls to center and size the image.

A list of common device signal types that *DualView XL* supports can be found in the "**Output Format List**" in Chapter 5.

Note that *DualView XL* can be used with non-standard display devices by entering your own timing parameters. The first 99 entries in the Output Format List are reserved for factory defined entries. Timing list entries from 100 to 160 are reserved for user defined entries. The "user entry" feature is helpful for storing non standard timing information or special applications where a preset timing parameter needs to be adjusted and then stored in a register. In some cases, you may also need to create your own custom timing parameters.

Use the following steps to set up the *DualView XL*'s output timing.

Note | This setup procedure applies to both analog and digital displays.

1. Obtain a copy of your display devices operations manual or technical guide, and make a note of the following important parameters:

   ~ **Type:** Is the display device a CRT or LCD device?

   ~ **Format:** Is the display device Analog or Digital?

~ **Resolution:** Note the display device's native horizontal and vertical resolution (e.g., 1600 x 1200).

~ **Refresh rate:** Note the display device's optimum refresh rate (e.g., 60Hz, 75Hz, etc.)

~ **Sync:** For analog devices, note the type of Sync required (5-wire, 4-wire or 3-wire).

~ **Sync polarity:** Note the preferred Sync Polarity (positive or negative).

~ **Interlace:** Most graphics displays are non-interlaced, but interlaced signals are used in some special applications. Note the required interlace setting (interlace or non-interlace) for your display.

2. Review the list of output parameters in the **Output Format List**, and find the set of parameters that *most closely match* those of your display device (as you noted in step 1). Make a note of the reference ID for this set of parameters (column 1 in the Output Format List). This ID will be used in a subsequent step.

   In Chapter 5, refer to the "**Output Format List**" section for a complete list of output timing parameters.

▲ **Example:** If your monitor is VESA 800 x 600 @ 75Hz, the reference ID is 11.

▲ **Example:** If your monitor is VESA 1280 x 1024 @ 75Hz, the reference ID is 21.

3. Ensure that the following connections have been made:

   ~ *DualView XL* is properly connected to the display monitor(s).

   ~ The controlling device (such as an ASCII terminal or PC) is properly connected to the *DualView XL* — either via serial or Ethernet connection.

   If required, refer to the "**Installation**" section for instructions.

4. Turn on the *DualView XL*.

5. Turn on your display monitor(s).

6. Turn on the controlling device, allowing time for it to boot up.

7. From the PC, establish a serial (or Telnet) connection to *DualView XL* (depending upon your configuration). If required, refer to the "**Communications Alternatives**" section for instructions.

8. With communications properly established, turn on the color bar test pattern. Type:

   ```
   TP BARS
   ```

   ... and press **Enter**. Verify that the color bar signal is visible on your display. At this point, however, it may not properly fit your display.

9. Using the **Output Timing Load** function, enter the ID of the timing parameters that you selected in step 2. Type:

   ```
   OPTLOAD <1...99>
   ```

   ... and press **Enter**.

10. Adjust the *display* to match *DualView XL*'s output: Note:

    ~ For a single display, leave the display's "auto-sync" circuitry on. Use the display's position and size controls to center the test pattern, and ensure that the entire test pattern is completely visible.

    ~ In some special applications, you may choose to change the output parameters of the *DualView XL* rather than using the adjustments provided by the display device. In this case you should use *DualView XL*'s **Output Timing Interactive** procedure to match the display settings. Refer to the "**Advanced Output Timing**" section for details.

Note	The **Output Timing Interactive** procedure can also be used to "fine tune" a single display.

11. With the display adjusted, adjust the *DualView XL*'s input timing using the **Input Interactive** procedure. Refer to the "**Input Timing**" section (page 27) for instructions.

ADVANCED OUTPUT TIMING

For most applications and timings, the steps outlined in the "Output Timing" section are adequate for matching *DualView XL*'s output to your display. However, for greater accuracy (particularly with dual or multi-monitor configurations), you can fine-tune output settings using the **Output Timing Interactive** function.

The "interactive" mode places a cursor on screen that defines the boundaries of the output signal (also known as the "active picture"). Unlike other *DualView XL* commands, the interactive mode is one that waits for keystrokes to position the picture, while all other commands are locked out. Additionally, users must "exit" the mode before normal command line interface functions can be issued.

Use the following steps to adjust output timing interactively:

1. Ensure that you've followed preliminary steps 1 through 8 in the preceding "**Output Timing**" section, and that you have selected color bars as the *DualView XL*'s test pattern output.

2. Begin the interactive output timing procedure. Type:

   ```
   Output Timing Interactive
   ```

   or the short form of the command,

   ```
   OPTINT
   ```

... and press **Enter**. A white box and cross hair appear on your output display.

3. Starting with the upper-left corner of the white box, use the keyboard controls listed below to position the top left corner of the box at the top left corner of the display monitor. Note that these adjustment commands *are* case sensitive.

> i = move up
> m = move down
> j = move left
> l = move right

NOTE: all the above are lower case commands.

The goal is to position the upper left corner for maximum image visibility, or for multi-display device configurations, to position the corner to *precisely* match the position of an adjacent display device image.

4. With the upper-left corner properly adjusted, use the keyboard controls listed below to position the bottom right corner of the box at the bottom right corner of the display monitor.

> I = move up
> M = move down
> J = move left
> L = move right

NOTE: all the above are upper case commands.

The goal is to position the bottom right corner for maximum visibility, or for multi-monitor configurations, to position the corner to *precisely* match the position of an adjacent monitor image.

5. To exit the function, type:

> q

... and press **Enter**.

This returns the system to the "normal" command mode of operation.

6. Repeat steps 2 through 5. This repetition is necessary to accurately fine-tune the timing parameters.

7. Once the display is adjusted, use the **Output Timing Save** function to save parameters in memory. *DualView XL* allows you to save up to ten user defined settings. These settings may then be recalled at any time to quickly change the system's output settings. To save settings in one of 10 available timing slots, type:

> Output Timing Save <100...160>
>
> or the short form,
>
> OPTS <100...160>

... and press **Enter**.

▲ **Example:** To save the timing parameters in register 9, type `OPTS 9`, **Enter.**

Every time you turn on the *DualView XL*'s power, the last output setting used will be automatically recalled. Note that if an **RFD** (Return to Factory Default) is performed, your custom settings will be lost and *DualView XL* will start with the factory default output settings.

This completes the advanced output timing procedure. Please continue with the **Input Timing** procedure outlined below.

INPUT TIMING

When you connect a graphics signal to a *DualView XL* input, the *DualView XL* will automatically search for a match between the signal and the list of signal types that it stores internally. This list consists of the combination of standard VESA defined signals and user defined signals.

- If the signal found in the list is an exact match, then no further adjustment is needed.

- If some adjustment is required, then implement the following adjustment procedure and save the new parameters to the user list. In this way, the next time the same signal is connected, no adjustment will be required.

Two command methods are available for adjusting input timing on each of the four input windows:

- The **Input Timing** function is an advanced feature that enables you to fine-tune each input by entering exact timing numbers. In Chapter 5, refer to the "**Input Commands**" and "**Timing Parameters**" sections for details.

- The **Input Interactive** function enables you to adjust each input's timing interactively. Note that interactive timing applies only to graphics inputs (not composite video or S-Video sources). This method is described below.

Use the following steps to adjust input timing interactively. The procedure takes you through the complete adjustment for one window (including naming and saving settings), and then asks you to repeat steps for each remaining input.

1. Ensure that you have a working serial (or telnet) connection to *Dual-View XL* (depending upon your configuration).

2. To perform interactive input timing, ensure that the desired input sources are connected to the appropriate *DualView XL* input modules. Refer to the "**Installation**" section for instructions.

3. Select the RGB or DVI input type as required for each input using the **Input Source** command.

   Type:

   ```
   INSRC <input#> [RGB | DVI | COMPOSITE1 |
   COMPOSITE2 | SVIDEO]
   ```

... and press **Enter**.

Please note the following points regarding the command's arguments:

~ When using an RGB graphic input connected to the RGB connector, select the `RGB` argument.

~ When using a digital video input connected to the optional DVI connector, select the `DVI` argument.

▲ **Example:** If a digital (DVI) source is connected to input 2, type `INSRC 2 DVI` and press **Enter**.

4. To begin the input timing procedure, type:

`InputInteractive <input#>`

or the short form,

`INI <input#>`

... and press **Enter**. An alignment signal will appear over the selected full screen input.

▲ **Example:** To adjust input 1 interactively, type:

`INI 1`

5. Starting with the upper-left corner of the image, use the keyboard controls listed below to position the image within the white frame. The goal is to position the corner for maximum image visibility. Note that these adjustment commands *are* case sensitive.

`i` = move up
`m` = move down
`j` = move left
`l` = move right

NOTE: the above commands are lower case.

6. With the upper-left corner properly adjusted, adjust the lower-right corner next by using these keyboard controls. The goal is to position this corner for maxium image visibility.

`I` = move up
`M` = move down
`J` = move left
`L` = move right

NOTE: the above commands are upper case.

7. To exit the function, type:

`q`

... and press **Enter**.

This returns the system to the "normal" command mode of operation.

8. Repeat steps 5 through 7 for the selected input. This repetition is necessary to accurately fine-tune the timing parameters.

9. Use the **Input Name** function to name the input source, up to 17 alphanumeric characters in length. Spaces are not allowed in the name, but underscores and upper/lower case characters are OK. Type:

    ```
    InputName <input#> <name>
    ```

    or the short form,

    ```
    INN <input#> <name>
    ```

    ... and press **Enter**.

▲ **Example:** To name input 1 "PowerPoint_1," type:

    ```
    INN 1 PowerPoint_1
    ```

10. Use the **Input Save** function to store the selected input's parameters in one of 61 slots in the Input List. These settings are recalled whenever the signal is reapplied to the *DualView XL*. Type:

    ```
    InputSave <input#> <100...160>
    ```

    or the short form,

    ```
    INS <input#> <100...160>
    ```

    ... and press **Enter**.

▲ **Example:** To save input 1 in Input List slot 101, type:

    ```
    INS 1 101
    ```

    This completes the procedure for adjusting, naming and saving the selected input.

11. Repeat steps 4 through 10 for all remaining *DualView XL* inputs.

WINDOW CONCEPTS

3
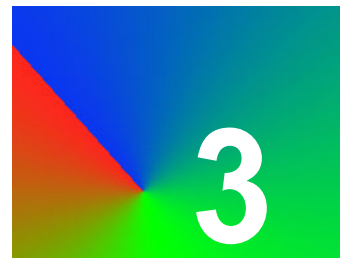
IN THIS CHAPTER

This chapter deals with the basics of window size and position beginning with the concepts of source and destination rectangles that are used throughout the document. In addition to sizing and positioning windows on the output, users can assign different types of signal to each window and apply border and titles to each window. These and other topics are shown in the following list:

- **Image Rectangles**

- **The Window Source Rectangle**

- **Window Destination Rectangle**

- **Aspect Ratio**

- **Positioning and Clipping**

- **Priority Levels**

- **Window Borders**

- **Window Labels**

IMAGE
RECTANGLES

The resolution of raster scanned images is defined by the number of pixels per line and the total number of lines per frame. For example the XGA format is defined as having a resolution 1024 x 768 (1024 pixels per line and 768 active lines). This convention is applied to both the input and output of the *DualView XL*. In windowing products, the input signal is the source image and the portion of the input signal that will be used is known as the **source** rectangle. This is an important point as it means the source rectangle does not necessarily have the same dimensions as the input signal resolution.

The **destination** rectangle defines the size and position of the window displayed on the output.

Each type of rectangle is described below:

- A "**source rectangle**" selects a rectangular *portion* of a full size input image. Typically, the source rectangle contains the *entire* image, but it can also contain a cropped portion (or subset) of the entire picture.

  This portion fills the destination rectangle (as described below), and appears in a window on the display device. *DualView XL* automatically changes an input's source rectangle as various zoom and pan controls are used to manipulate portions of the full-size image.

- A "**destination rectangle**" specifies the output window's size and screen position on your display device. The contents of the window is defined by the source rectangle's parameters.

The setting of source and destination rectangles is accomplished using the **WSR** (Window Source Rectangle) and **WDR** (Window Destination Rectangle) commands, as discussed in the following sections.

THE WINDOW SOURCE RECTANGLE

The **source rectangle** for each input is defined in terms of the input image's pixel position in coordinate space. The image's top left corner is positioned using these coordinates, and the image's width and height are defined in the same way.

In the first example below, the full size source image is 640 pixels wide by 480 lines high.
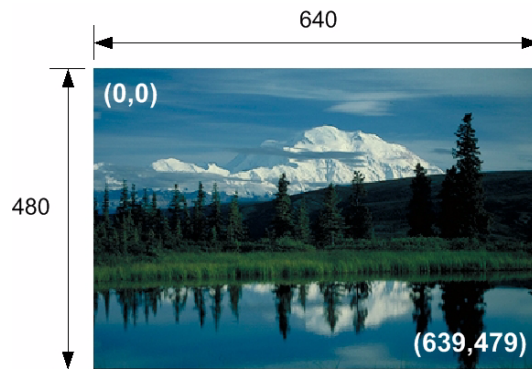
Figure 3-1. Full Size Source Image

By convention, the upper left corner starts at pixel coordinate (0,0). The bottom right corner ends at coordinate (639,479). When using the *DualView XL*, the Window Source Rectangle (**WSR**) uses the following convention to define a window source rectangle:

```
x, y, width, height
```

The x and y parameters define the coordinates of the first pixel located at the top left of the image. The width and height parameters then define the size of the image. This convention is used in the command line interface with the **WSR** command which sets the source rectangle for the selected input.

Thus, to define (and use) the full size picture from **Figure 3-1** as the window output the WSR would be defined as :

```
0 0 640 480
```

In the second example below, a *portion* of the full size source image has been

defined.
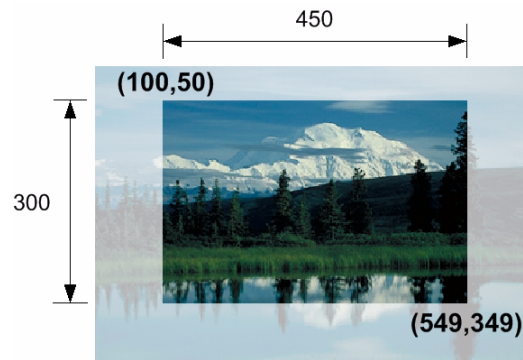
Figure 3-2.   Portion of Full Size Image

The "cropped" image is 450 pixels wide by 300 lines high. The upper left corner starts at pixel coordinate (100,50). The bottom right corner ends at coordinate (549,349).

Thus, to define (and use) the "cropped" size picture from **Figure 3-2** as your window the WSR would be defined as:

```
100 50 450 300
```

**WINDOW
DESTINATION
RECTANGLE**

Each input's **destination rectangle** is defined in terms of the **display device's** screen space coordinates, rather than the input picture's coordinates. Each destination rectangle represents the source rectangle *mapped* to a specific size and position on the display.

In the example below, the display monitor is 1280 x 1024. The full size source rectangle from **Figure 3-1** is mapped to a destination rectangle, starting at coordinates (300,500), with a horizontal width of 600 pixels and a vertical height of 250 lines.
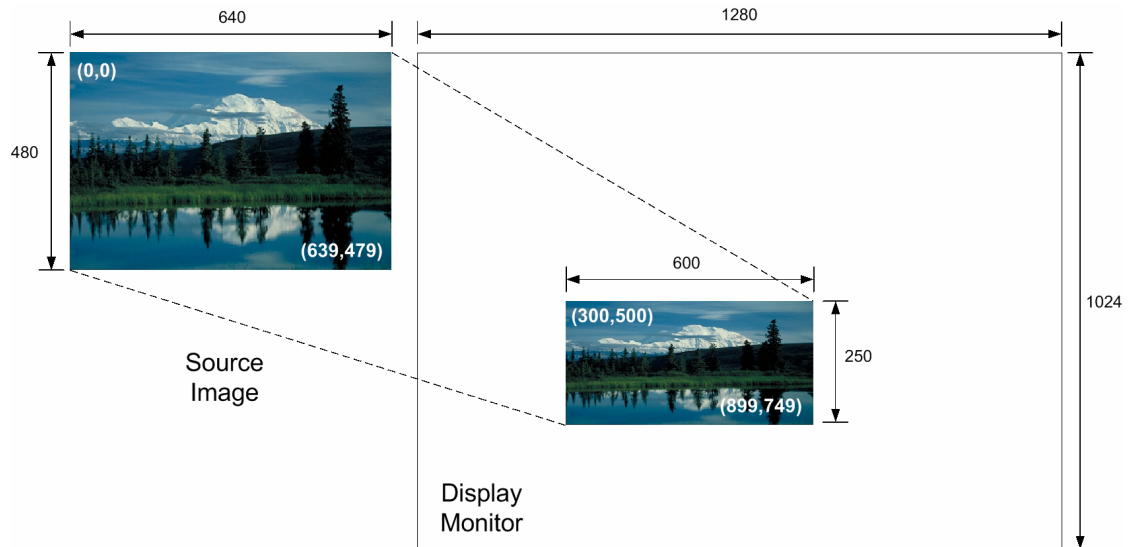
Figure 3-3. Full Size Source mapped to Destination

The Window Destination Rectangle (**WDR**) defines the destination rectangle for the window displayed on the output in terms of both position and size. Thus, to map the full size picture from **Figure 3-1** (**WSR** 0 0 639, 479) to a destination rectangle the **WDR** would be defined as:

```
300 500 600 250
```

Note that in this example the original image size (the source) is 640 x 480 pixels but the size of the destination is 600 x 250. The resulting image (destination image) is smaller than the original and also has a different aspect ratio. Also the image is no longer located at the top left (origin) of the output display but is mroe towards the center.

In the next example, the "cropped" image from **Figure 3-2** is mapped to a new destination space on the display device.
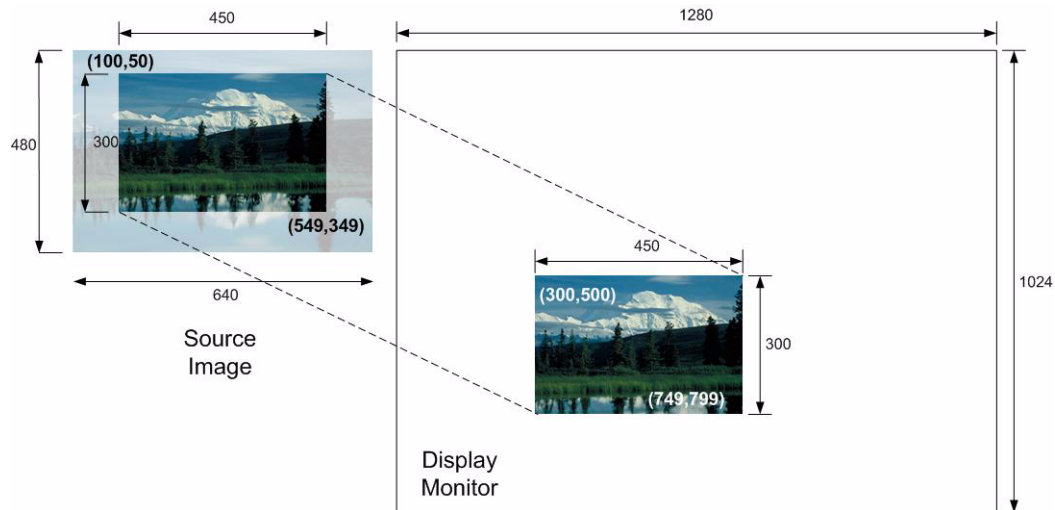
Figure 3-4. Cropped Source mapped to Destination

In this case the **WDR** would be defined as:

```
300 500 450 300
```

By this means we have taken a portion of the source image and without resizing it can place it anywhere on the display device. By changing the destination size parameters (450 300 in the above example), to 1280 x 1024 we could expand this cropped image to fill the display device. In this case the **WDR** would be

```
0 0 1280 1024
```

NOTE: This is effectively zooming into a section of the source image.

ASPECT RATIO

As you learned in the previous sections, the **source rectangle** selects any desired rectangular portion of an input image, and this image can then be displayed (mapped) in a **destination rectangle** — in an identical or different sized display window. Please note:

- The destination rectangle can be set to any shape and any size on the output monitor — up to the full size of the output display screen.

- The size and shape of the source rectangle are *independent* of the destination rectangle's size and shape.

Suppose that you have defined an input's source and destination rectangles so that a 320 x 240 portion of a video source image is mapped into a 640 x 480 window. Here, the destination rectangle is larger than the source rectangle, but it has the *same shape* and the same width-to-height aspect ratio (4:3). Thus, the original input image is enlarged (scaled) equally, in both dimensions.

Varying the destination rectangle's size but preserving its aspect ratio makes the displayed image larger or smaller. As long as its proportions correspond to

those of the source rectangle, the output image resembles the input image.

If you *independently* vary the shape of either the source or destination rectangle, so that their aspect ratios are no longer the same, the displayed picture will appear stretched or squeezed as compared to the original image.

POSITIONING AND CLIPPING

A window can be positioned anywhere on the output display. If the window's destination rectangle is defined so that a portion is off the screen, that portion of is "clipped" — until it is moved back into view.

Two examples of "image clipping" are illustrated below. In the first example, the full size source rectangle (640 x 480) is mapped to a destination rectangle, starting at (900,100). The right-hand portion of the source image is clipped.

1280

1024

(900,100)

(1540,580)

Clipped portion is not visible on the output

Display Monitor
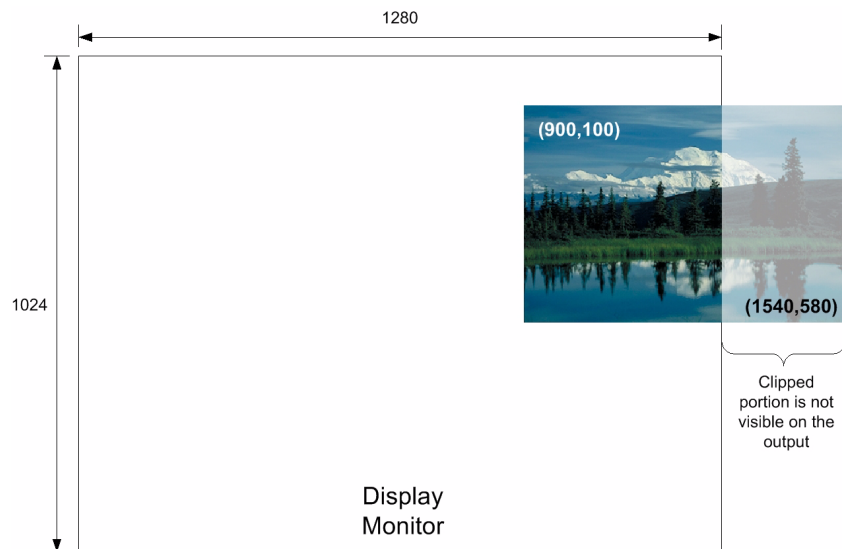
Figure 3-5.   Clipped Image, Screen Right

In the second example, the same source rectangle is mapped to a destination rectangle starting at (-200,200). By specifying screen coordinates with negative

values, the left and top edges of the source image can be clipped.
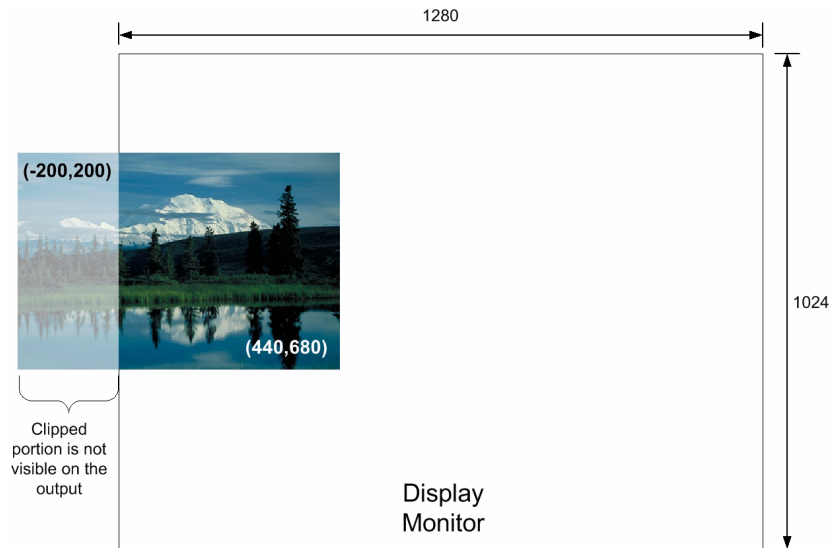
Figure 3-6.   Clipped Image, Screen Left

PRIORITY LEVELS

DualView XL uses the **Priority** function to determine which of several overlapping windows are visible. You can change the priority levels of windows so that different ones come into the foreground and others move to the background. When windows overlap, their relative visibility depends on their respective user-assigned priority levels.
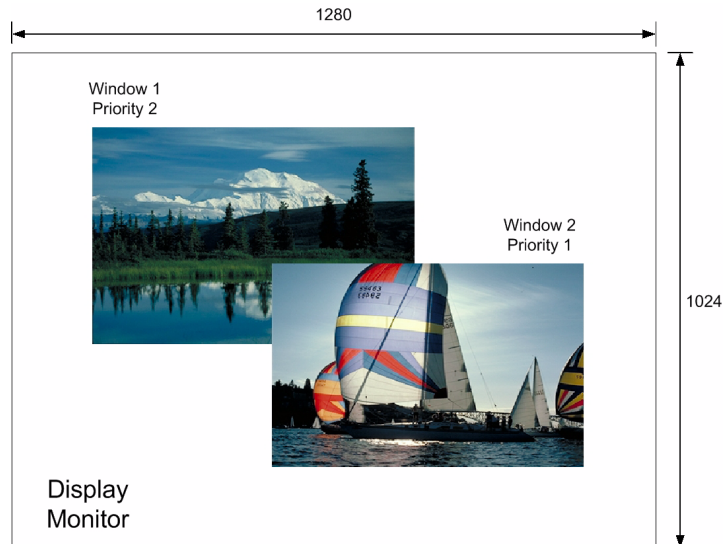
Figure 3-7.   Image Priorities

In the example above, since priority level 1 corresponds to the highest priority in this example, window 2 has priority over the other windows, and overlays any overlapped window with a lower priority.

Please note:

- The available levels are 1 through 2, where 1 represents the highest priority (and visibly, the image that is on top).

- The window with the highest priority is the one that is displayed on top. Lower priority windows are stacked beneath it.

- Only the overlapped region of a window is actually obscured by a higher priority window. No two windows may have the same priority.

- If a window's priority is increased, the window previously holding that priority is automatically demoted by one level.

WINDOW BORDERS

A border can be individually applied to each of the *DualView XL* windows. The following border attributes can be applied independently to each window:

- Border width - adjustable from zero to one hundred pixels in width

- Border color - use predefined saturated colors or define custom color using a 24 bit value.

Tip	If you add a border to a window, the border is applied outside of the window and the WDR is unchanged. To retain the same position, the WDR start point would need to be offset by the border width. To retain the same overall size the WDR height and width should be reduced by 2x the width of the border.
	▲ Example: The WDR is 120 100 640 480 before a border is applied and a 30 pixel border is added. To retain the same overall size and position the WDR should be changed to
	`150 130 580 420`
	See **Window Commands** (Chapter 5) for details about enabling borders using the command line interface or **Changing Window Borders** (Chapter 4) for setting borders using the Web Control Panel.

WINDOW LABELS

A label can be applied to each window independently of the border. The label is positioned in the center of the lower border area. (it does not appear over the active picture area). The label is a fixed size and is not affected by the border width. To provide visibility in the absence of a border, the label is provided with it's own background.

The label has the following attributes, all of which can be set for each window.

- Window Label Name - a 23 character message for each window. (Note that the space character is allowed).

- Window Label Color - choose the color of the text for each window label

- Window Label Background Color - a background is applied behind the label text. The color of this background can be set independently for each label.

- Window Label Enable - the label can be turned on or of for each label independently.

See **Window Commands** (Chapter 5) for details about setting labels using the command line interface or **Making Window labels** (Chapter 4) for setting labels using the Web Control Panel.
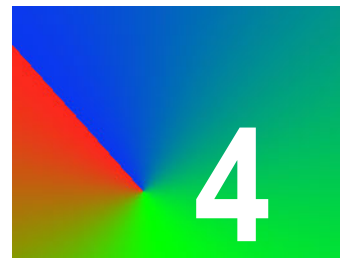
WEB CONTROL PANEL

IN THIS CHAPTER

This chapter provides information about using the *DualView XL* web control panel (WCP). The WCP is a graphical interface providing full control of the *DualView XL* remotely through a network connection using a standard web browser. The following topics are discussed in this chapter.

- **WCP Overview**
- **Launching WCP**
- **WCP Operational Functions**
- **WCP System Page**
- **WCP Input Page**
- **WCP Output Page**

WCP OVERVIEW

The Web Control Panel is a set of web pages organized functionally as follows:

- Log in Page
- Main Page
- Input Adjustments
- Output Adjustments
- System Settings

The function of each of these pages is described briefly below:

LOGIN PAGE

When you connect to the *DualView XL* from a standard web brower you will be first presented with the Login page. This page provides password protection to the WCP. When the correct password has been entered, the main WCP page will open.

MAIN PAGE

The Main page provides real time control of the size and positioning of windows on the *DualView XL* output. From this page you can launch pop up pages to access image adjustments such as brightness and contrast, as well as navigate to the Input and Output Timing adjustment and System setting pages. Additional functions such as setting borders and creating labels can be accessed

directly from this page.

INPUT ADJUSTMENTS

This page is used for making adjustments for each of the RGB graphics and video input signals. Once these adjustments have been made typically they do not have to be reset.

OUTPUT ADJUSTMENTS

This page is used for making adjustments for *DualView XL* output. Generally this involves selecting the desired output format, and no further adjustments are required.

SYSTEM SETTINGS

This page is used to provide systems information and set the *DualView XL* communication parameters such as the serial port baud rate or the network IP address. This is also the page used to set or change the password.

LAUNCHING WCP

The *DualView XL* contains a built in web server providing a graphical control interface (WCP) that you may access from a web browser in a similar way that you access web sites on the internet.

CONNECTING TO THE WCP

To control the *DualView XL* using WCP you will need to launch a standard web browser. Note for best results we recommend the use of the Microsoft Internet Explorer (6.0 or later). In order to connect to the *DualView XL* you will need to know the IP address of the *DualView XL* If you have not previously set this address during the installation and set up procedures, then you will need to do so before proceeding. See Chapter 2, for details.

- Type the IP address of the *DualView XL* into the address bar of your web browser and press the "GO" button.

- If you successfully connect to the *DualView XL*, the Log in screen for the WCP will be displayed in your browser window (Figure 4-1). If not then refer to the **System Troubleshooting** section in Chapter A..
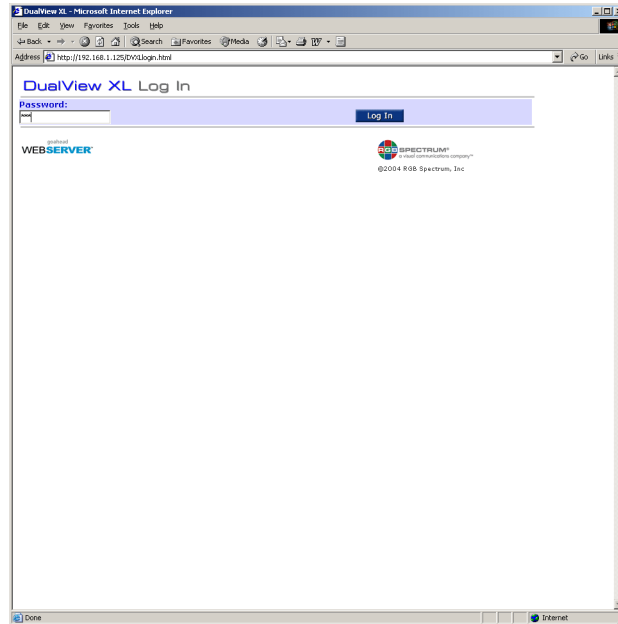
Figure 4-1. WCP Login screen page

- If you have not changed the password, enter the default password "RGB" (upper case) and then click on the Login button. If you have changed the password enter your password and then click on the Login button.

  See **Setting the Password** (page 56) for information about changing the password.

- After you have successfully entered the password the main WCP screen will be displayed. This is the screen that allows you to adjust the *DualView XL* window settings.

WCP NAVIGATION

WCP is operated from the WCP Main page. This page provides navigation buttons at the top of the page that open new pages for the Input, Output and System pages. These pages will stay open until you close them on the individual pages.

In addition to the set up pages, the WCP Main page has navigation buttons at the bottom of the window that open up additional pages to allow image adjustments, and border, label and fade controls.

WCP OPERATIONAL FUNCTIONS

After you have logged into the *DualView XL*, the WCP main page is automatically displayed. Pop up windows controlling set up features such choosing output resolution or making fine adjustments to input timing are launched from buttons located at the top of the main window (see **WCP Set Up Pages,** page 55, for more information).

MAIN PAGE LAYOUT

The WCP Main page is divided into 5 sections providing graphical control of window size, position, labels, borders and fades.

Virtual screen -

Interactively move, size, enable and disable all the *DualView XL* windows

Setup Menu Bar -

Launches pop up set up menus directly from the Main page.
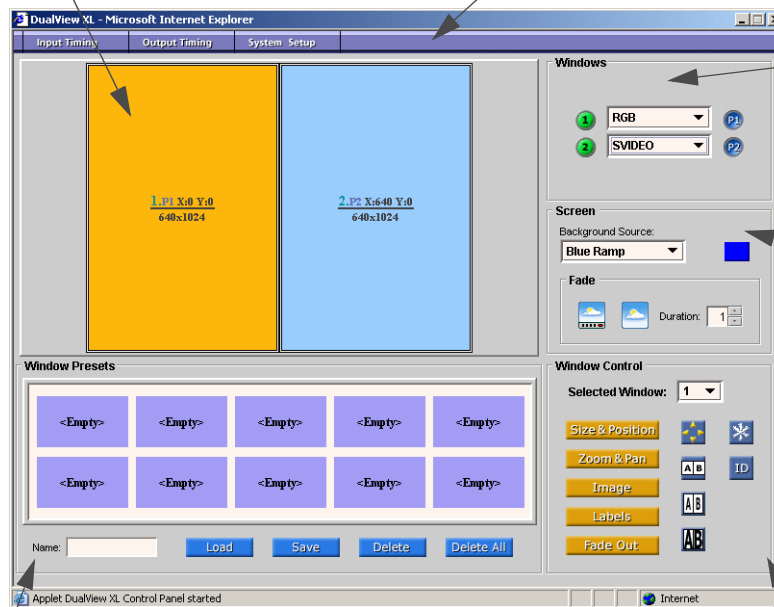
Window -

Select input type, change priority, enable / disable individual windows

Screen -

Select background type, control fades.

Window Presets -

Save and load up to ten presets each containing window size, position, label and border settings

Window Controls -

Select window to adjust and open up other windows to control size, position, zoom, pan and image adjustments.

Figure 4-2. Main Screen Layout

The location of the different sections of the Main screen are shown in Figure 4-2 above.

MAIN SCREEN FEATURES

From the Main screen you can make many adjustments to the *DualView XL* output image.

Major features are listed in the following list:

- **Selecting a Window**

- **Sizing and Positioning Windows**

- **Zoom & Pan**

- **Enabling & Disabling Windows**

- **Input Source Selection**

- **Changing Window Priority**

- **Identifying a Window**

- **Freezing a Window**

- **Changing the Background Source**

- **Making Image Adjustments**

- **Video Window Options**

- **Changing Window Borders**

- **Making Window labels**

- **Fading the output**

- **Fading all Windows**

- **Fading an Individual Window**

- **Using Window Presets**

SELECTING A WINDOW

To change any aspect of a window such as size, position, border, labels or image quality you will need to select the specific window. WCP provides two ways to select a window from the WCP main page.

If the window is visible in the virtual screen area then position the cursor within the window and click on the required window. The selected window is identifiable by the yellow background inside the window rectangle.

The alternate method to select a window is to use the drop down selector located in the lower right section of the WCP Main page.

SIZING AND POSITIONING WINDOWS

WCP provides the ability to dynamically size and position all windows using the drop and drag technique. The region in the top left of the WCP Main page is the virtual screen (Figure 4-2). The position and relative size of all enabled windows is shown in this area. Each window is represented by a rectangle. The current size and position are indicated within each rectangle.
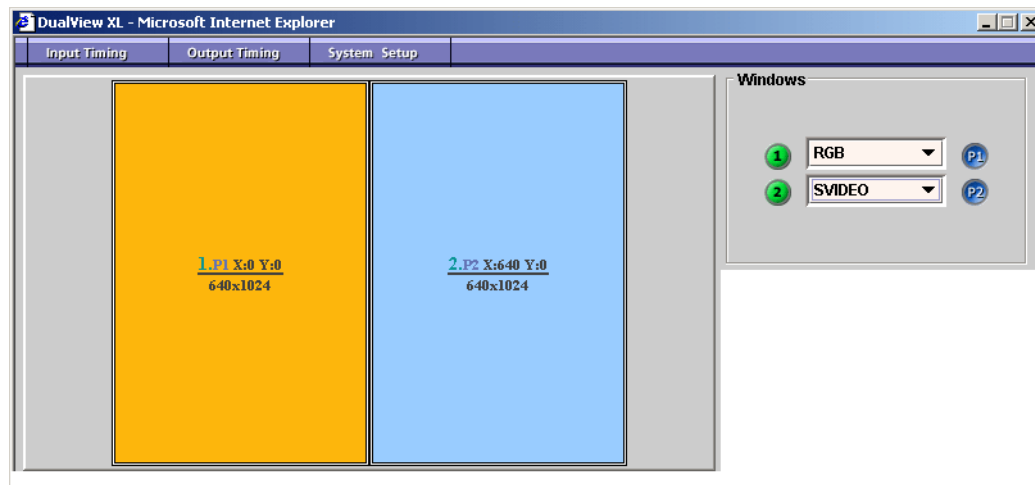
Figure 4-3. WCP Virtual screen and Window Input selector

MOVING WINDOWS INTERACTIVELY

To move a specific window use your mouse to position the cursor into the required window and press and hold the left mouse button. While holding the mouse button move the window to the desired position and release. The *DualView XL* window will track the position of the WCP virtual window. This interactive method provides a convenient way of approximately setting the position of a window. For finer adjustment you can move the window using the cursor arrows on your keyboard. Each press of the cursor arrow will cause the window to move in single pixel increments up, down or left to right. Additionally you can use the "Home", "Page Up", "Page Down" and "End" buttons.

To enter window position coordinates or size, use the window Size and Position pop up as described later in this section (see Figure 4-4).

SIZING WINDOWS INTERACTIVELY

To stretch the window horizontally, move the cursor to the edge of the virtual window that you would like to stretch. The cursor will switch into a double headed arrow when it is in the resizing mode. Note that if a border is present, the active area for resizing is on the inside edge of the border.

Press and hold the left mouse button and drag the window edge to the desired location. This can be performed independently for the height and width so that the aspect ratio of the window can be easily changed.

If you want to size the window without changing the aspect ratio, you should grab the corner of the window and drag the corner diagonally to the size that you require. Once you have selected the corner, you can use the keyboard

cursor keys as described previously for more precise adjustments.

Each window can be independently controlled in this way.

PRECISELY ADJUSTING WINDOW POSITION & SIZE

The click and drag method is useful to make coarse settings of the size and position or each window. If you need to precisely set the size or position of a window then you can access the size and position pop-up menu (Figure 4-4). This menu provides the ability to move and size windows with single pixel precision.

To size the window use the spin boxes in the Size section of the Size and Position page. If you want to set the size of the window to a specific size, then it is generally quicker to enter the number directly into the box. If you want to set the size interactively, then you can use the up and down buttons associated with the spin box to smoothly increment or decrement the height or width of the window.

Figure 4-4. Size and Position pop-up page

To position the window use the spin boxes in the Position section of the Size and Position page. If you want to position the window to an exact location on the screen, then it is generally quicker to enter the number directly into the box. If you want to position the window interactively, then you can use the up and down buttons associated with the spin box to smoothly increment or decrement the X or Y position of the window.
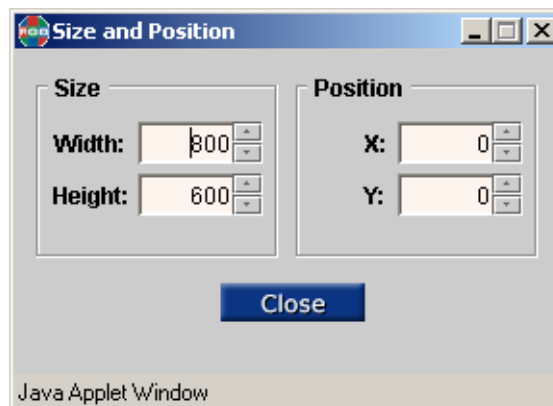
ZOOM & PAN

Zoom and pan inside each window is accomplished by using the Zoom and Pan pop-up window shown in Figure 4-5.
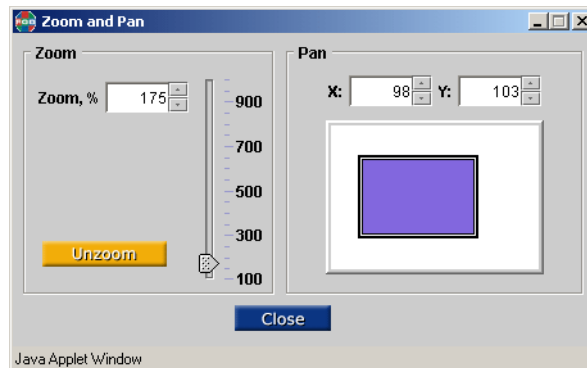
Figure 4-5. Zoom & Pan pop-up page

The Pan and Zoom pop-up menu is accessed by clicking on the Pan and Zoom button located in the Window Controls section of the WCP Main page (Figure 4-2).

Zoom is applied to the window currently selected in the WCP Main page (see Selecting a Window, page 43). Zoom within a window by using the slider or spin box in the Zoom section. To return to normal click on the Unzoom button.

The Pan section of the window shows the region of the current window that is being displayed in the window. This view enables you to quickly move to a specific area of the full size image. The size of the region being displayed is set by the amount of Zoom applied (see previous paragraph). There are two methods you can use to move the zoomed area around inside the full screen image.

- Enter the specific values you want in the spin boxes at the top of the Zoom/Pan page or use the up down boxes associated with the spin boxes.

- Click on the active area inside the zoom window located in the Pan section of the page. You may then pan inside the window by dragging the zoomed area within the input image.

ENABLING & DISABLING WINDOWS

The input source selection section is located in the top right of the WCP main page (Figure 4-2). Immediately to the left of the source selection drop down selector is the window enable button for the associated window (Figure 4-6). The enable buttons are colored green when the window is enabled and grey when the window is disabled. Pressing a disabled button will enable the window, and pressing an enabled button will disable the window. Each window can be independently controlled in this way.
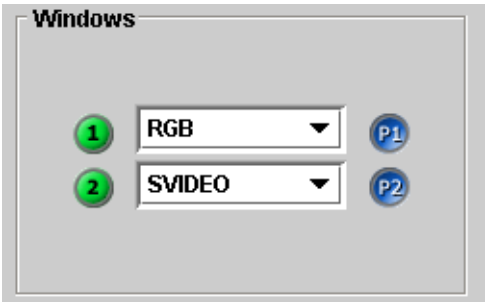
Figure 4-6. Window Enable, Priorities and Input selection

INPUT SOURCE SELECTION

Each window can be filled with your choice of input signal. Each window has the choice of RGB, S-Video or composite signals (note that if you are not using the S-Video input it can be used as an additional composite video input which is identified as COMPOSITE2). You will also use this selector to choose the DVI input if your units is installed with the optional DVI input capability.

CHANGING WINDOW PRIORITY

When windows overlap, windows will appear to be behind or in front of each other. The order in which they appear is known as the window priority. The current priority is indicated in the Window section (Figure 4-6) by the blue Priority indicators adjacent to the window input selectors. To change the priority of each window, locate the Priority indicator that you wish to use for your window, click on the Priority indicator and drag it over the top of the window whose priority you wish to change, and release the button. For example in Figure 4-6, to change the priority of Window 1 from Priority 2 to Priority 1 you would click on the P1 indicator and drag over the top of P2 which is currently assigned to Window 1.

Figure 4-7. Window Control section of main WCP page

IDENTIFYING A WINDOW

If you want to identify a specific window on the *DualView XL* output, you should select the window and select the Window ID button in the Window Control section of the WCP Main page (Figure 4-7). The

selected window will flash on and off briefly for a few seconds and then return to the previous settings automatically.

Sometimes you may want to freeze the image inside a window. This is accomplished using the Freeze function. This function is applied to the selected window by using the Freeze button located in the Window Control section of the WCP Main page (Figure 4-7). The image will remain frozen until the Freeze button is pressed again.

Windows are positioned in front of a background. The background can be set to be a solid color or shaded. The type of background is selected using the Background Source selector located above the Window Control section of the WCP Main page (see Figure 4-8). The selector provides choices between shaded backgrounds with pre-defined colors, or chose a background with a solid color. You can change the color of the solid background to any of the available colors on the color palette. The color palette is accessible by pressing the colored palette select button adjacent to the Background Source selector
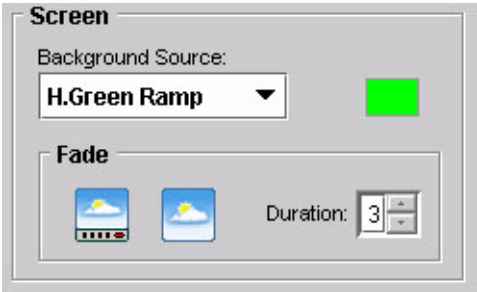
Figure 4-8.   Background Source and Output Fade adjust panel

Characteristics of the image such as brightness, contrast, hue or saturation can be adjusted separately for each window. A separate page (Figure 4-9) associated with image adjustments can be launched directly from the WCP main page. The Image adjustments are applied to the selected window.

See '**Selecting a Window**' (page 43) for information.

Brightness, Contrast, Saturation and Hue may be adjusted by either the slider associated with each of them, or using the spin boxes located immediately above each slider. Exact values may be entered directly into the spin boxes by clicking in the entry box, and typing the value from the keyboard. Press the Enter key to complete the entry.

When using the slider controls, the new values are applied immediately so that you can interactively adjust the settings.

Click on the default button to restore the default values to each of the adjustment parameters.

Sharpness is adjusted using a drop down selector located at the upper right corner of the Image Adjust page. This adjustment enables to make an image

sharper or softer. Positive values of sharpness will emphasize detail in the image, and negative values will reduce the apparent detail in an image. Note that the Default button on this page does not reset the Sharpness value.
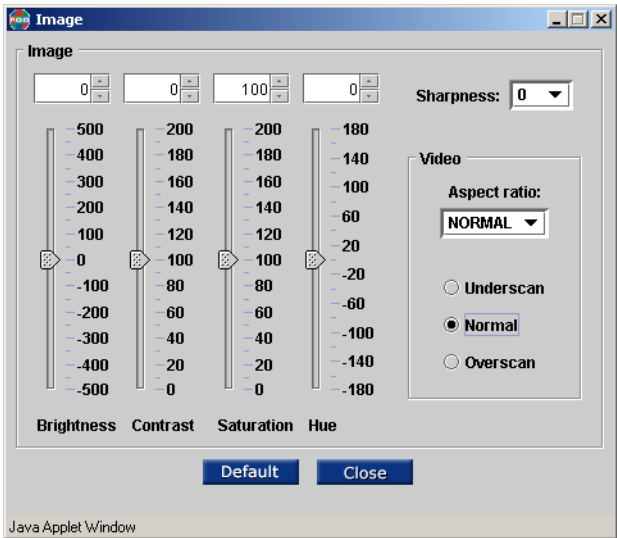
Figure 4-9. Image Adjust Page

VIDEO WINDOW OPTIONS

The Video section of the Image Adjust Page is active only when a Composite Video or S-Video source is selected for the window. If the selected window does not have a video source selected, the selection button titles will be grayed out to indicate that they are unavailable.

OVERSCAN & UNDERSCAN

Unlike graphics inputs, video inputs (Composite and S-Video) do not have the ability to adjust the input timing. This is generally not necessary as video signals have well standard blanking intervals. TV sets and displays are normally set up to ignore some of the active picture area. This is known as "Overscan", a feature that the *DualView XL* also provides. To apply overscan to a video window click on the "Overscan" button in the Video section of the Image Adjust Page. In some special circumstances you may want to see more of the image than is normally displayed. This can be accomplished by clicking on the "Underscan" button on the Image Adjust Page.

VIDEO ASPECT RATIO

Most motion pictures are made with a wide aspect ratio. When they are transferred to DVD or video tape they are set up so that they will display on a display with a 4:3 aspect ratio. To display the full image in the original aspect ratio the images are often produced in letter box style which has black borders at the top and bottom of a 4:3 display. When viewed on a 16:9 display this same

image can be displayed in 16:9 aspect ratio without black borders by applying stretch to the vertical axis. This is known as anamorphic wide screen. You can apply this same technique to video windows with *DualView XL* by using the aspect ratio selection. This is typically used when your output resolution is set for a wide screen display.

To select the optimum display set up, choose the appropriate aspect ratio in the Aspect Ratio drop down menu (the Normal setting is for a 4:3 display with a 4:3 input and no vertical stretch is applied).

When you have finished using the Image adjustment page, close by clicking on the page close button.

CHANGING WINDOW BORDERS

Each window can have a colored border applied around it. The width and color of this border can be set individually for each window, or applied to all windows. Border controls are grouped with the label controls in the WCP Labels page.
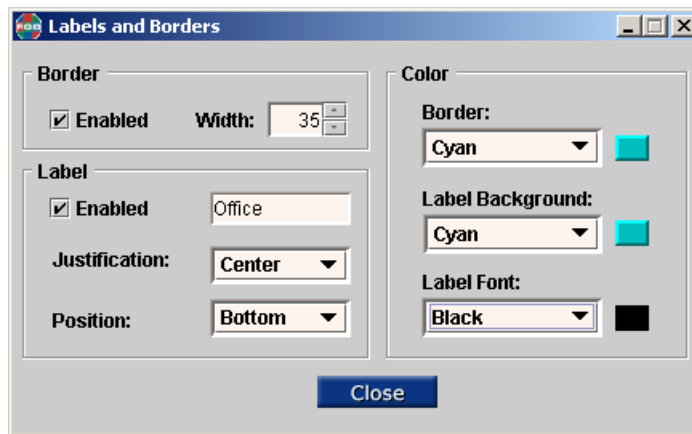
Figure 4-10. Labels and Borders Control page

To access the Labels and Borders page, click on the Labels button in the Windows Control section of the WCP Main page (Figure 4-7).

To change the border width enter the desired border width into the border width window at the upper left of the Labels page. The maximum width border is 100 pixels, and the minimum size is zero pixels. Click the border Enable button to turn on the border.

The border color can be selected from a list of saturated colors or picked from the Color Selector. To select a pre-defined saturated color, click on the drop down Border Color box and scroll through the colors to find the desired color.

To pick a custom color click on the drop down Border Color box and select the Custom color selection. Click on the Color Selector button to the right of the Border Color down box. Use the Red. Green and Blue slider controls to set your desired border color (Figure 4-11).
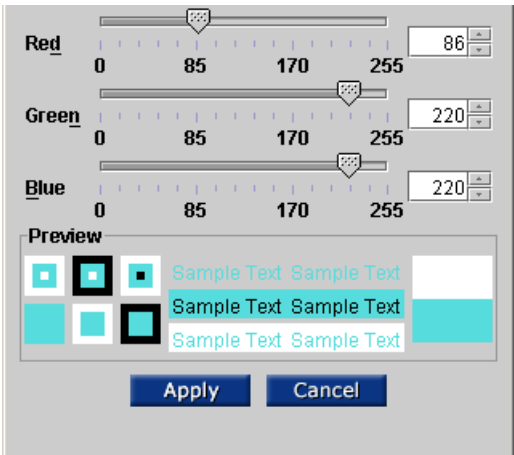
Figure 4-11. Color Selector pop up page

**MAKING WINDOW
LABELS**

A label can be applied to each window. This is independent of the border settings, so that you can set a label without need to have a border. Labels can be placed above or below the associated window by selecting "Top" or "Bottom" from the drop down "Position" dialog window (Figure 4-10). You can also justify the label to the left, center or right of the window by selecting from the "Justify" drop down menu selector.

Label text is entered in the label text box at the lower left section of the Labels and Borders page (Figure 4-10). A label can be up to 23 characters in length and can include spaces. The label is applied to the currently selected window.

Use the enable check box to turn the label on and off.

Each label is applied over a colored label background. The color of the text and label background can be set independently using the color controls at the upper right section of the Labels page. Drop down selectors are used to pick either a pre-defined saturated color, or pick a custom color. To set the custom color click on the Color Selector button to the right of the Text or Text Background section.

**FADING THE
OUTPUT**

The entire *DualView XL* output can be faded to black using the Fade Output function. This is accomplished from the Screen section of the WCP main page. The duration of the fade is set using the Duration drop down selector in the Screen section of the WCP Main page (Figure 4-8). The Fade Output button is an alternate action button. Pressing the button once will cause the windows and background to fade out. Pressing the button again will cause them to fade in.

**FADING ALL
WINDOWS**

Fade the windows without fading the background by using the Window Fade function. The Window Fade button is an alternate action button used to fade in or fade out all the windows together (Figure 4-8).

The duration of the fade is set using the Duration drop down selector in the Screen section of the Main page (Figure 4-8).

**FADING AN
INDIVIDUAL
WINDOW**

A single window can be faded independently of the other window using the Fade function. The Fade button is located in the Window Control section of the Main page (Figure 4-7).

The duration of the fade is set by the Fade Duration drop down in the Screen section of the Main page (Figure 4-8).

Note: When a window is faded out the associated Window Enable button will show the disabled state. You may then Fade the window back in using the Fade button, or turn it back on using the Window Enable buttons located on the WCP Main page.

**USING WINDOW
PRESETS**

Window presets are a powerful feature of the *DualView XL* enabling you to rapidly switch between different window arrangements that you have previously saved. The WCP window preset section is located directly below the virtual screen section of the WCP Main page.
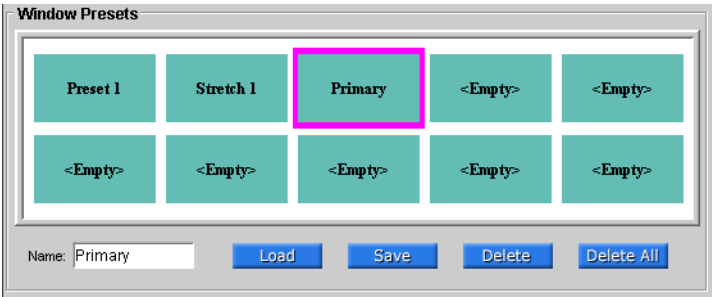
Figure 4-12.   Window Preset Section

DualView XL has a total of ten window preset registers. Access to these registers is provided by the ten preset buttons located below the virtual screen (Figure 4-12). Positioning the cursor over any of these buttons and clicking once will select that button. The selected button is highlighted by a blue border.

After you have selected a preset you may then apply one of the following functions.

- Load

- Save

- Delete

- Name

LOADING A PRESET

To recall a previously saved preset you may select the preset and then click on the Load button located below the preset buttons. The preset can also be loaded by double clicking the desired Preset button.

SAVING A PRESET

The current setting of the *DualView XL* will be saved to the selected preset by clicking the save button. All presets are saved in non-volatile memory so shutting off the power will not lose your settings. However, saved presets will be deleted if you execute the Restore the Factory Defaults command (see **RestoreFactoryDefaults** in Chapter 5).

Tip	It is important that you name a preset before storing it (see next section). The WCP will not recognize presets that are stored without a name.

NAMING A PRESET

Each preset register can be named to enable you to remember the use or contents of the preset. Select the preset that you wish to name and enter the name into the Preset name box. Press the enter key to complete the entry.

Note that the name must be no more than 23 characters in length. Spaces are not allowed in the preset name.

COPYING A PRESET

You can easily copy the contents of one preset register to another by the following simple process.

- Load the register that you want to copy from.

- Select the register that you want to copy to.

- Press the Save register button.

DELETING A PRESET

You can delete the contents of any preset register by selecting the preset and clicking on the Delete button. Note that there is no undo feature so make sure that you are deleting the correct preset.

WCP EVENT LOG

The WCP provides a graphical means to set up your *DualView XL.* Each time that you make an adjustment, the WCP issues a command to the *DualView XL*. The WCP Main page provides the ability to capture these commands to a list known as the Event Log. This list may be useful if you wish to know the commands and associated parameters that you may wish to use with an external thrid party controller.

To generate an Event Log use the following procedure:

- Position the mouse cursor anywhere over the WCP Main page.

- Press the CONTROL + L keys on your PC keyboard to start the event recorder.

- Make required adjustments to the *DualView XL* using the WCP.

- Press the CONTROL + L keys on your PC keyboard to stop the event recorder.

When the event recorder stops, the Event Log page automatically pops up. Using standard cut and paste techniques you can copy the required commands and paste them into your controller script.

WCP SET UP PAGES

This section discusses the set up of the *DualView XL*. These features are typically set at initial installation and are rarely changed. Functions such as window size and position, image parameters such as brightness and contrast or window presets are all operational features that are accessed from the WCP Main page. Navigation buttons at the top of the WCP page launch one of the three set up pages:

- **WCP System Page**

- **WCP Input Page**

- **WCP Output Page**

WCP SYSTEM PAGE

The system page provides information about the system. Additionally you can change communications settings as well as the WCP password.

Figure 4-13.   WCP System page

**CHANGING THE IP
SETTINGS**

There are three IP settings that must be set correctly before using your *DualView XL* on a network. These are the IP address, the IP subnet mask and the default Gateway. Depending upon our network configuration, you may need to change only the IP address. Consult with your network manager before changing these settings.

Each of the three settings has a dedicated entry box (see Figure 4-13). The current settings are shown in the entry boxes. Enter the new settings into the boxes. For the new settings to be activate the *DualView XL* must be rebooted. This is accomplished automatically.

Tip	When the system has rebooted and has activated the new IP address, your web browser will be disconnected. You will have to reconnect to the *DualView XL* by logging in using the new IP address.
	If you entered the IP address incorrectly, or do not know the unit's IP address you can either establish the current IP address by using the serial port IPADDR command, or reset the unit's IP address to the factory default value by pressing the front panel Communications Default button (**Figure 2-1 on page 8**).

**CHANGING THE
SERIAL PORT
SETTINGS**

The serial communications settings can be viewed and changed in the serial port section of the system page. Use the selector box for setting the baud rate.

**SETTING THE
PASSWORD**

If you wish to control web access to the WCP you can set a unique password. A password can consist of any text string of normal alphabetical characters excluding spaces and punctuation marks. To make sure that you do not make a mistake in changing the password you must enter the password again in the password confirmation box before it can be accepted.

If you do not want to have a password, delete all the characters in the password entry box.

**SAVE
CONFIGURATION**

The *DualView XL* is designed to continuously update your settings in non-volatile memory. If power is lost and then restored, the settings last used before the loss of power are automatically restored. If you want to return the settings to some custom settings that you commonly use (your own default settings), then you should use the **Save Configuration** feature. To use this feature you will need to set the *DualView XL* to the state that you would like to save. This includes settings for window sizes and positions, borders and labels and image settings such as contrast. When you have set the unit to your satisfaction , click on the **Save Configuration** button and the settings will be stored.

Note: You can store only one custom configuration.

RECALL CONFIGURATION

After you have saved your own custom system settings (see SAVE CONFIGURATION in the previous section), you can quickly retrieve them using the **Recall Configuration** button. When you click on this button the settings will be immediately recalled.

Note: When you recall the configuration your current settings will be replaced by the saved configuration settings. There is no undo feature.

EXPORT SETTINGS

There are many parameters stored in the *DualView XL* including current settings for window size, position, brightness and presets. You can save these settings inside the unit using the **Save Configuration** feature as previously discussed. The **Export Settings** feature allows you store these same parameters externally in a file on your PC. This feature is useful if you would like to use these same settings on a different *DualView XL*. You can then "clone" the settings of one *DualView XL* and then import them into a different unit using the **Import Settings** feature. You can also save multiple configurations by storing them in different files on your PC.

For details about what parameters are saved in the export file, please refer to **Settings Export/Import**, (page 116).

Saving your settings is a two step process that is initiated using the WCP Export Settings button.

Step 1. Create a settings file in *DualView XL* **memory**

- Click on the Export/Import setting button located in the lower section of the System page (Figure 4-13). This will open the Export/Import menu page (Figure 4-14).

- Enter a file name in the file dialog box, or if you wish to use the default filename "export.txt" proceed directly to the next step.

- Click on one of the "Elements" selection buttons. These buttons allow you to save all of the device parameters, or just the system, window and timing parameters. The contents of each of these is described in detail in *Appendix C* ,**Settings Export/Import.**

- Click on the "Export Settings" button to create a copy of the current settings in *DualView XL* memory.

Step 2. Transfer the export file to your PC

- Open another web browser, and in the browser address bar type the following address:

  ftp://<ip address>, where <ip address > represents the IP address of your *DualView XL*. (the same address that your WCP is connected to).

▲ Example - if the ip address of your *DualView XL* is 192.168.1.200 type **ftp://192.168.1.200**

Tip

> Most people are familiar with using the browser to view web pages, but are not familiar with using the browser to move files. Viewing web pages requires the *http* protocol but moving files uses the *ftp* protocol. Remember to type *ftp* in the browser address bar and not *http*.

- At the login screen type '**rgb**' for user name and "**spectrum**' for the password. NOTE: Be sure to you use lower case characters as the interface is case sensitive.

- In the ftp browser window you should see the file that was created in Step 1 of this procedure. The file will be named "export.txt" or whatever name you chose as an alternative.

- Drag the file to the folder on your PC where you wish to store it.

- In the ftp browser window delete the file "export.txt".

  This last step is recommended to avoid confusion when you import the settings file from your PC in the future.
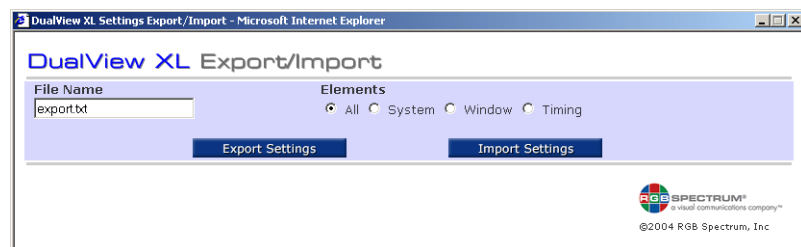
Figure 4-14. WCP Settings Export/Import Page

IMPORT SETTINGS

After you have saved your settings to your PC using the **Export Settings** feature, you can recall them to your *DualView XL* using the I**mport Settings** feature.   Importing saved settings is a two step process.

Step 1. Transfer the file from your PC to the *DualView XL* memory

- Open another web browser, and in the browser address bar type the following address:

  ftp://<ip address>, where <ip address > represents the IP address of your *DualView XL*. (the same address that your WCP is connected to).

▲ Example - if the ip address of your *DualView XL* is 192.168.1.200 type **ftp://192.168.1.200**

Tip	Most people are familiar with using the browser to view web pages, but are not familiar with using the browser to move files. Viewing web pages requires the *http* protocol but moving files uses the *ftp* protocol. Remember to type *ftp* in the browser address bar and not *http*.

- At the login screen type '**rgb**' for user name and "**spectrum**' for the password. NOTE: Be sure to you use lower case characters as the interface is case sensitive.

- On your PC, find the file that was stored previously using the *DualView XL* Export settings feature. The file will be named "export.txt", or the name that you chose when you stored the file.

- Drag the file from the PC folder into your browser ftp window.

Step 2. **Load the saved settings into** *DualView XL*

- Click on the Import setting button located in the lower section of the System page (Figure 4-13). This will replace the current *DualView XL* settings with the settings from the imported settings file.

| Note | Imported settings will be immediately applied to the settings in your unit.

There is no undo function. |
|---|---|

RESTORE FACTORY DEFAULTS

The *DualView XL* is configured at the factory with a standard set of settings known as Factory Defaults. When you use your system, these settings are replaced by the settings that you choose. Your settings are stored in non-volatile memory so that they will not be lost by turning off the unit or pressing the reset button. If you wish to return to the initial settings then click on the **Reset Factory Defaults** button.

Note: Your current IP address settings will not be affected by using the **Reset Factory Defaults** feature. You will however lose all of your settings including the contents of your Preset Registers.

RESTART

The **Restart** button causes the *DualView XL* CPU to reset. This will result in loss of communication with the WCP. After performing a **Restart** you will have to log in to the *DualView XL* again. Unlike the **Reset Factory Defaults** function, **Restart** will not reset your settings or affect the contents of your Preset registers.

WCP INPUT PAGE

· ·

The input page is used to make timing adjustments to each of the window graphics inputs.
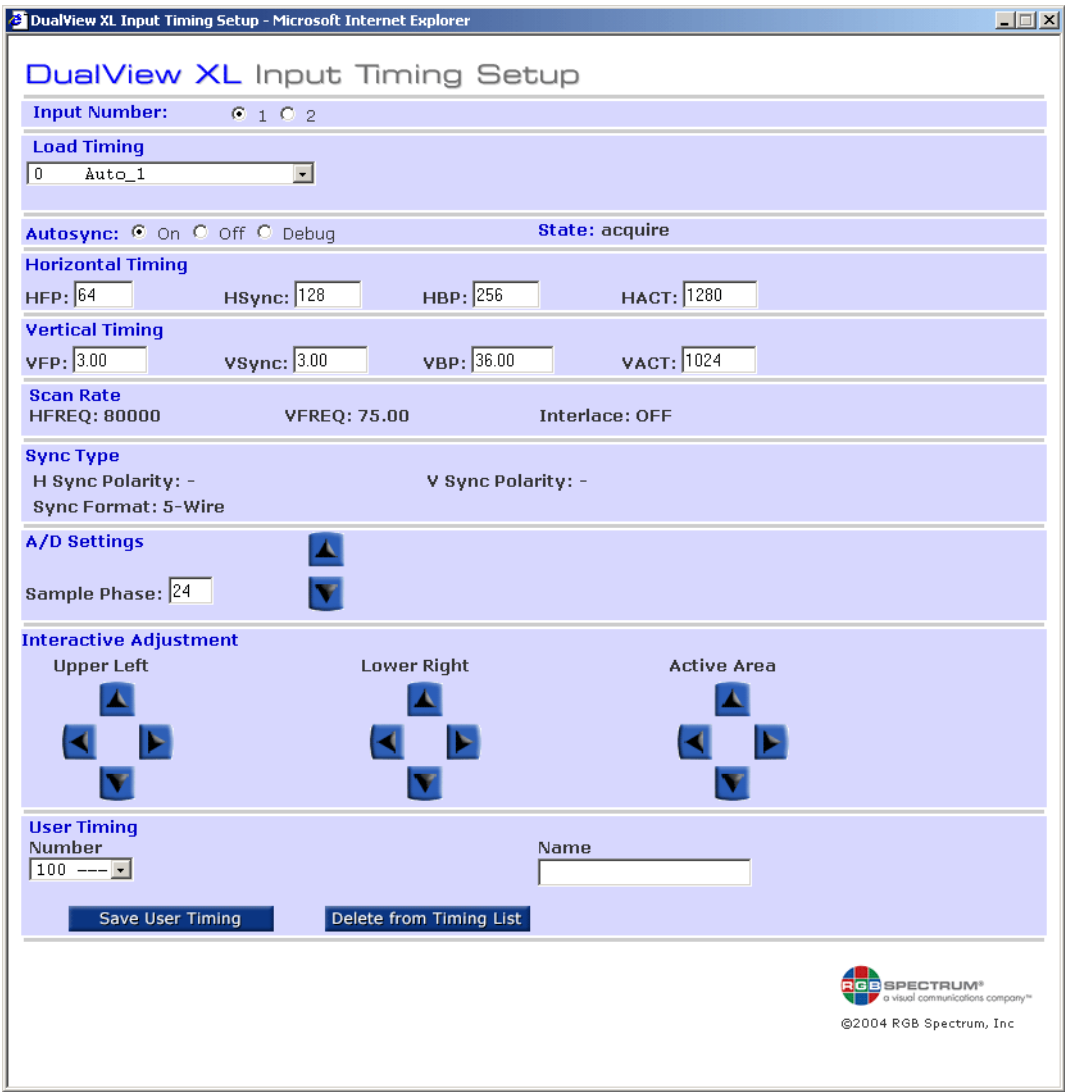
Figure 4-15.   WCP Input page

INPUT NUMBER

· · · · · · · · · · ·

The *DualView XL* has two RGB analog inputs. Each of these inputs may have a different format of signal so it is necessary to independently set them. The **Input Number** select buttons at the top of the WCP Input page (Figure 4-15) are used to select the input to be adjusted.

Note: Selection of the input is independent of the selected window on the WCP Main page.

LOAD TIMING

Below the input select buttons is a selector window indicating the currently used timing setting. You can use this control to change the input setting used for each input of the *DualView XL.*

WCP OUTPUT PAGE

The output page is used to select and adjust the output signal from the *DualView XL.* There are a number of standard settings available to choose from the selector list, and in addition you may define an output signal that can be saved to the timing list.

Figure 4-16.   WCP Output page

LOAD TIMING

The *DualView XL* provides a wide range of standard output formats as well as allowing user defined output formats. Changes to output settings can be made from the WCP output page (refer to Figure 4-16 to locate the controls needed).

To select the desired output timing click on the drop down "Load Timing" at the top of the Output Timing Setup page and select the required format by scrolling through the list until the format appears in the entry window. As soon as the selection is made the*DualView XL* will load the new parameters and the output will be reconfigured to the new format.

The drop down list contains a list of pre-defined graphics formats in addition to used defined formats. User defined timing parameters are entered on the Output Timing Setup page as described later in this section.

OUTPUT TIMING
PARAMETERS

Immediately below the "Load Timing" entry box, there are four data fields containing the individual timing parameters that are currently loaded. If you are using standard timing values then these fields are for information only. Advanced users may wish to set these values to suit special requirements.

HORIZONTAL TIMING

The user may change the following horizontal timing parameters:

- Horizontal Front Porch (HFP)
- Horizintal Sync interval (HSync)
- Horizontal Back Porch (HBP)
- Horizontal Active Period (HACT)

The number of active pixels is defined by the Horizontal Active period which is typically the first number referred to in defining display resolution. For example HACT = 1280 for the VESA 1280 x 1024 resolution signal.

The total number of pixels in a line is the total of all of the above horizontal parameters.

VERTICAL TIMING

The user may change the following horizontal timing parameters:

- Vertical Front Porch (VFP)
- Vertical Sync interval (VSync)
- Vertical Back Porch (VBP)
- Vertical Active Period (VACT)

The number of active lines is defined by the Vertical Active period which is typically the second number referred to in defining display resolution. For example VACT = 1024 for the VESA 1280 x 1024 resolution signal.

The total number of lines in a frame is the total of all of the above vertical parameters.

SCAN RATE

In the raster scanning system used with the type of signals you will use with *DualView XL*, there are two types of scan.

- Horizontal scan

- Vertical scan

The horizontal scanning frequency governs the rate at which each line is drawn, and the vertical scanning frequency governs the rate at which the frames are drawn (otherwise known as the refresh rate).

Some signals (normally video signals) produce two fiels of information that are interleaved to make each frame. This is a technique that is used to reduce the amount of bandwidth required for a signal, and is mostly used for video signals. The majority of graphic signals are non-interlaced (progressive).

If you wish to generate an interlaced signal click th echeckbox labeled "Interlace"

SYNC POLARITY

The horizontal and vertical scanning systems of the display must be synchorized to the scan system used in creating the image. This is accomplished by synchronizing signals that accompany the graphcis signal. The polarity of the sync signal must be known for correct synchronizing to occur. If you select a pre-defined timing signal, these values are automatically set and displayed in the "H Sync" and "V Sync" polarity check boxes. If you wish to change these settings click in the appropriate sync polarity checkbox.

SYNC TYPE

Analog graphics signals are distributed as separate Red, Green and Blue signals, each carried on a separate wire (3 wires total). The sync signal also need to be connected to the display device. There are three ways that synchronizing signals are connected.

- Separate Horizontal and Vertical sync signals (known as 5 wire)

- Combined (composite) Horizontal and Vertical sync signals carried on a separate wire (known also as 4 wire)

- Composite sync signal added to the Green channel of an RGB signal. (known aslo as 3 wire).

If you wish to change the current setting of sync type parameter click in the desired "Sync Format" checkbox.

INTERACTIVE ADJUSTMENT

Normally the display device provides controls to center and size the image on the display screen. If these controls are not available, the output of the *DualView XL* can be adjusted using the "Interactive Adjustment" controls.

COMMAND LINE INTERFACE

. . . .

This chapter discusses *DualView XL* control commands that provide access to all of the unit's functions. The following topics are discussed:

- **Control Overview**

- **Command Format**

- **Command Set List**

- **Timing Parameters**

- **Output Format List**

CONTROL OVERVIEW
. . . .

DualView XL may be controlled externally via RS-232, or via the unit's Ethernet 10/100BASE-T port, as shown below.
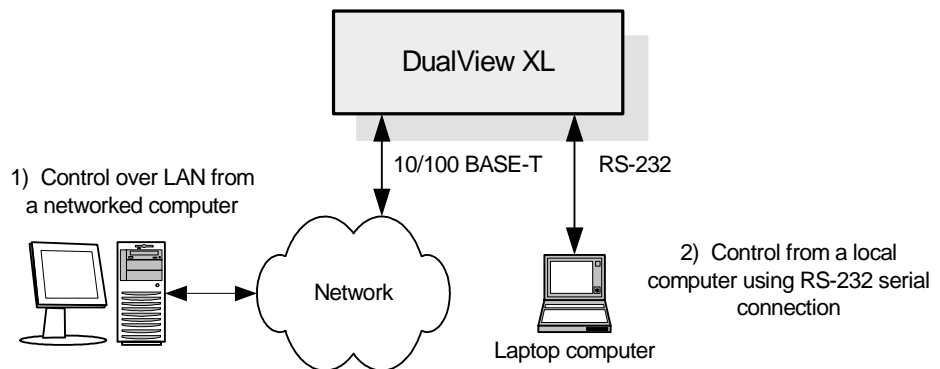
Figure 5-1. *DualView XL* **Control Methods**

DualView XL's **Command Set** provides full system control, and with few exceptions, all commands can be issued using either the serial port or the Ethernet port (using a Telnet-like session). Exceptions are noted in the command descriptions. Remember that control via Ethernet requires a connection using the *DualView XL*'s IP address. In Chapter 2, refer to the "**Communications Alternatives**" section for instructions.

COMMAND FORMAT

All *DualView XL* control functions are issued via ASCII commands that are used to set one or more system parameters (or values). Typically, *DualView XL* is controlled by a third party machine such as a PC or laptop.

COMMAND LINE USAGE

All commands take the following form:

```
COMMAND NAME <value1> <value2>...
```

... and press **Enter**.

Parameter values are shown in angle brackets < >. In the above example, value1, value2 (etc.) are *required* parameters specific to the stated command.

▲ **Example**: Set *DualView XL*'s baud rate to 9600 bps:

```
BAUDRATE 9600
```

The majority of commands have both long and short forms:

- The long form version is an easily understood word (or the concatenation of two or more words).

- The short form version is a brief, one to seven letter abbreviation of the command.

Note	With the exception of several "interactive" functions, commands are not case sensitive. In the **Command Set List**, upper case characters in the long form version indicate the letters required for the short form version.

In the example above, the command "**BAUDrate**" could be entered four different ways:

```
BAUDRATE
baudrate
BAUD
baud
```

To execute commands, each command line must be followed by a carriage return (pressing **Enter**).

COMMAND HELP

▲ **Commands:** "<u>Help</u>"

There are two primary ways to use the *DualView XL*'s help feature:

- Type HELP to list all *DualView XL* commands.

- Type HELP followed by the command to get command-specific help.

▲ **Example:** Type `H BRI` to get help on the **Brightness** function.

▲ **Example:** Type `H WSR` to get help on the **Window Source Rectangle** function

PREDEFINED PARAMETER VALUES

Some commands have predefined values, and only these may be used as parameter choices. Predefined parameter choices are indicated as

        `<value1|value2|value3>`

▲ **Example:** The choices for **BAUDrate** are:

        `<9600 | 19200 | 38400 | 57600 | 115200>`

QUERY THE CURRENT SETTING

When a command is entered without any parameters, *DualView XL* reports back the current settings of the selected parameter.

▲ **Example:** What is the current baud rate setting ?:

    `BAUDrate`

would return:

    `9600`

PARAMETER RANGES

Parameter values may be a range of values or a defined set of choices (as described above in the "**Predefined Parameter Values**" section).

Ranges are indicated as:

        `<value1...value2>`

▲ **Example**: The value of **BRIght** is a range of

        `<-500...500>`

ADDRESSABLE COMMANDS

Commands such as **BAUDrate** do not need an explicit address, as the *DualView XL* has only a single serial port. However, other commands can be applied to several destinations. For example the "brightness" command can apply to all *DualView XL* inputs or to an individual input — depending upon how the command sequence is structured.

An individual destination is indicated by the parameter such as **<input#>**, and is typically the first parameter following the command name.

▲ **Example:** Set window #1's brightness value to 50:

    `BRIght 1 50`

Many commands allow the use of the optional modifier **ALL** which enables you to set all applicable destinations with one command. The command parameter will then be indicated in the following form:

        `<window#|ALL>`

The **ALL** modifier is useful for setting all input channels to the same value.

▲ **Example:** Set the brightness value of all windows to 0:

    `BRIght ALL 0`

**OPTIONAL
PARAMETERS**

Some commands have optional parameter values that are *not required* in a command. These discretionary values are indicated by square brackets `[]`:

```
COMMAND <value> [<value2>]
```

VideoAspect is a command with optional parameters. In this example, **<value>** is a required parameter and **[<value2>]** is optional:

```
VideoAspectRatio <input #> [NORMAL | WS1 | WS2 |
WS3 | WS4]
```

In this case, the command may be used to query the VideoAspectRatio settings by using only the window #.

COMMAND SET LIST

The following sections list all commands for controlling the *DualView XL*. Commands are arranged according to categories:

- **Input Commands**

- **Output Commands**

- **Window Commands**

- **Image Control Commands**

- **Serial Port Commands**

- **Network Commands**

- **Miscellaneous Commands**

Note	It is recommended that you take the time to review each of these lists, trying as many commands as possible with your *DualView XL*. In that way, you will quickly become familiar with the machine's full capabilities, in addition to improving your operational skill.

INPUT COMMANDS

Input commands allow you to make input adjustments, and then save these settings into the unit's internal memory. A summary of input commands is listed below. Click the desired command to access detailed instructions.

Table 5-1. **Input Commands Summary**

Command	Description
INputAutoSync	Sets the input mode for the specified input.
INputFormat	Checks the video format of the current video input selection.
INputINTeractive	Enters input interactive mode to visually adjust specified input's timing parameters.
INputLOAD	Loads the indicated entry from the Input List to the specified input channel.
INputNAME	Names the specified input.
INputPHASE	Adjusts the phase of the Analog/Digital Converter to optimize picture quality.
INputSAVE	Saves the specified input to the selected entry in the Input List.
INputSouRCe	Selects the analog or digital graphics source for the specified window.
INputTiMing	Sets the selected input's timing
TiMingLIST	Displays the entire Timing List of saved input timings.
TiMingLISTCLEAR	Deletes all user defined input timing sets.
TiMingDELete	Deletes the specified entry from the Timing List.
TiMingLISTLOAD	Loads a complete set of timing parameters to the specified timing list entry.

Refer to the "**Input Commands Descriptions**" section for a complete description of all input commands.

INPUT COMMANDS DESCRIPTIONS

The table below lists all input commands, their arguments and detailed descriptions.

Table 5-2. **Input Commands Descriptions**

Command	Arguments	Description
INput**A**uto**S**ync	<input # | ALL> [AUTO | LOCK | DEBUG]	Sets the input mode for the specified input. `Auto` engages the autosync circuitry. `Lock` turns the autosync circuitry off. `Debug` provides information on input status and reports changes to measured parameters. Default: `Auto`
INput**F**ormat	<input #>	Checks the video format of the current video input selection. The command is only valid when `Input Type` is set to either Composite, or S-Video. The response to the command will be NTSC or PAL.
INput**INT**eractive	<input#>	Enters input interactive mode to visually adjust specified input's timing parameters. A white box and cross hair appear over the full screen input. Starting with the upper-left corner of the image, use these keyboard controls to position the image within the white frame: `i` = move up `m` = move down `j` = move left `l` = move right With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls: `I` = move up `M` = move down `J` = move left `L` = move right With the image properly adjusted, quit the utility: `q` = quit After you have adjusted the input to your satisfaction, use the `Input Name` command to name your input source, and the `Input Save` command to store the setting to the Input List.
INput**LOAD**	<input #> <1…160>	Loads the indicated entry from the Timing List to the specified input channel. Timing list entries from 1 to 99 are reserved for factory defined timing parameters. Entries from 100 to 160 are available for user defined timing entries. The entry is loaded only if it matches the measured signal parameters — sync format and polarity, interlace state, vertical total, and horizontal frequency.
INput**NAME**	<input #> <name>	Names the specified input. The argument can be up to 23 alphanumeric characters with no spaces (use underscore for space). Default: `Auto_1`
INput**PHASE**	<input#>[0...31]	Adjusts the phase of the Analog/Digital Converter to optimize picture quality. Applies to Analog RGB inputs only. Default: `24`

Table 5-2. **Input Commands Descriptions(Continued)**

Command	Arguments	Description
INput**SAVE**	<input#> <100…160>	Saves the input timing parameters for the specified input to the selected entry in the Input List. Whenever a signal is applied to the graphics input the signal parameters are measured and compared to entries in the list. When a match is found it is applied to the *DualView XL*.
INput**S**ou**RC**e	<input#> [RGB | DVI | YUV | COMPOSITE1 | COMPOSITE2 | SVIDEO]	Selects the analog or digital graphics source for the specified window. Default: `RGB`
INput**TiM**ing	<input #> [<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>] | [HFP | HS | HBP | HACT | VFP | VS | VBP | VACT] [value]	Defines the active area of the input signal and the selected input's timing. Using this command, the user can set all timing parameters as query or set the value of an individual parameter. For example to query the value of vertical sync width issue the command '**INTM VS**'. Horizontally, the active part of the signal is `<hact>`. The inactive part (h blanking) is `<hfp>` + `<hs>` + `<hbp>`. The total number of pixels horizontally is `htotal` = (h blanking) + `<hact>`. Note that the pixel clock frequency = `hfreq x htotal` so changing the total horizontal pixel count (`htotal`) will directly change the frequency of the sample clock. The active part of the vertical component of the signal is `<vact>`. The inactive part (v blanking) is `<vfp>` + `<vs>` + `<vbp>`. The total number of lines is `vtotal` = (v blanking) + `<vact>`. Since *DualView XL* knows the total line count an error will result if the sum of the active and inactive parts entered in the command do not match the measured total line count. Refer to the "__Timing Parameters__" section for details on timing parameters.
INput**TiM**ing**ADJ**ust	<input #> <UL | LR> <I | J | M | L> <1…20>	A non modal alternative to the **IN**put**I**nteractive command. Allows user to specify which corner to adjust. The parameters UL and LR represent the upper left and lower right corners of the output image. The parameters I,M move the image up and down by the amount specified by the step size value (1..20 lines). The parameters J,L move the image left and right by the step size value (1..20 pixels).
TiMing**LIST**	[<1 … 160> [<1 … 160>]] | [ACTIVE]	Displays the entire Timing List. If arguments are supplied, displays only the portion of the list requested. The `Active` argument displays all saved list entries.
TiMing**LISTCLEAR**	none	Deletes all user defined input timing sets. This does not affect the factory specified timing entries 1...99
TiMing**DEL**ete	<100 … 160>	Deletes the specified timing list entry. Timing list entries 1...99 are reserved for factory specified timing and may not be deleted.

Table 5-2. Input Commands Descriptions(Continued)

Command	Arguments	Description
TiMingLISTLOAD	<100…160> <name> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> <hfreq> <sync> <hpol> <vpol> <il>	Provides the ability for a user to completely define an input signal. This does not require an input signal to be present to do so. `TimingListLoad` could be used to enter the list entries one by one. • The first argument, <100…160> indicates the Timing List entry number in which to store the timing string. • The second argument, `<name>`, gives a customized name to the signal. • The next eight arguments, `<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>`, define the signal's timing. • The next five arguments, `<hfreq> <sync> <hpol> <vpol> <il>`, define the horizontal frequency, sync format and polarity, and interlace status. All 15 arguments must be supplied for the command to be successful. Refer to the "**Timing Parameters**" section for details.

OUTPUT
COMMANDS

Output commands control the *DualView XL*'s output. They define the output timing and sync format, and save, load, and delete timings to the Output List. A summary of output commands is listed below. Click the desired command to access detailed instructions.

Table 5-3. Output Commands Summary

Command	Description
OutPutENable	Switch or fade the output to or from black.
OutPutREFerence	Selects the output's timing reference.
OutPutTiMing	Sets the output timing by parameter.
OutPutTiMingADJust	Output timing adjust intended for use by external controller.
OutPutTiMing INTeractive	Enters the output interactive timing adjustment mode.
OutPutTiMingLOAD	Sets output display parameters from values stored in Output Timing List.
OutPutTiMingNAME	Assigns a user-defined name to the Output Timing List entry in use.
OutPutTiMingSAVE	Saves the current output timing settings to the specified user timing slot.

Refer to the "**Output Commands Descriptions**" section for a complete description of all output commands.

OUTPUT COMMANDS DESCRIPTIONS

The table below lists all output commands, their arguments and detailed descriptions.

Table 5-4. Output Commands Descriptions

Command	Arguments	Description
Out**P**ut**EN**able	[ON |OFF] [duration]	Enables or disables the output signal. When used with the optional duration parameter the output will fade to black for the specified duration. The duration parameter has a range of 0.1 .. 5.0 seconds. Default: **ON, duration = 1.0**
Out**P**ut**REF**erence	[EXT | INT | DEBUG]	Selects the output's timing reference. • When **INT** is selected, the output is locked to an internally generated clock (also known as Free Run mode). • When **EXT** is selected, the output is locked to the input signal connected to input #1. Default: **INT**
Out**P**ut**TiM**ing	[<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> [<hfreq> <sync> <hpol> <vpol> <il>]] | [HFP | HS | HBP | HACT | VFP | VS | VBP | VACT | HFREQ | SYNC | HPOL | VPOL | IL] [value]]	This advanced mode sets the output timing by parameter. The command supports the ability to set all parameters at once, or the ability to set (or query) the status of individual parameters. Refer to the "**Timing Parameters**" section for details on all timing parameters.
Out**P**ut**TiM**ing**ADJ**ust	<UL | LR> <I | J | M | L> <step size>	A non modal alternative to the **O**ut**P**ut**TiM**ing **INT**eractive command. Allows user to specify which corner to adjust. The parameters UL and LR represent the upper left and lower right corners of the output image. The parameters I,M move the image up and down by the amount specified by the step size value (1..20 lines). The parameters J,L move the image left and right by the step size value (1..20 pixels).

Out**P**ut**TiM**ing **INT**eractive	none	Enters the output interactive adjustment mode, enabling you to optimize the output timing values to better suit your display. Once in the interactive mode, a white box and cross hair appear on the output display.
		Starting with the upper-left corner of the box, use these keyboard controls:
		    i = move up
		    m = move down
		    j = move left
		    l = move right
		With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls:
		    I = move up
		    M = move down
		    J = move left
		    L = move right
		With the image properly adjusted, quit the utility:
		    q = quit

Table 5-4.   Output Commands Descriptions(Continued)

Command	Arguments	Description
Out**P**ut**T**i**M**ing**LOAD**	<1...160>	Sets the output display parameters from values stored in the specified Output Timing List. Note that timing list entries 1..99 are reserved for factory defined timing parameters. Entries 100 ..160 are user-defined. Refer to the "**Output Format List**" for details on all entries and timings.
Out**P**ut**T**i**M**ing**NAME**	[name]	Assigns a user-defined name to the Output Timing List entry currently in use. The name text string can be up to 23 alphanumeric characters with no spaces (use underscore in place of a space).
Out**P**ut**T**i**M**ing**SAVE**	<100...160>	Saves the current output timing settings to the specified user timing slot.

WINDOW COMMANDS

Window commands cover positioning and visibility functions, and enable you to control the display configuration, zoom and pan operations, freezing inputs and more. A summary of commands is listed below. Click the desired command to access detailed instructions.

Table 5-5. Window Commands Summary

Command	Description
DualView	Switches the output to one of several dual window modes
DualViewMap	Swaps inputs between windows without having to reposition windows.
FReeZe	Turns freeze status of the selected input on or off.
FullScreen	Sets the selected input to a full screen display.
OVerScan	Performs an automatic 2% enlargement on video inputs only.
PAN	Activates the pan utility for the selected input.
POSition	Allows you to move an input window around the output display.
PRIority	Set which windows are in front of, and in back of other windows.
ResetSourceRectangle	Resets source rectangle to default values.
SETRATE	Sets the amount that a window moves with the **Position** command.
SIZE	Activates size utility to resize the specified input window.
UNderScan	Turns on or off the Underscan feature for the specified window.
VideoAspectRatio	Identifies "letterbox" inputs to display without black borders.
WindowBorderCOLOR	Sets the color of the border surrounding a window.
WindowBorderWIDTH	Sets the width of the border surrounding a window.
WindowDestinationRectangle	Sets both the position and size of an input's destination rectangle.
WINdowENable	Turns on or off the specified window.
WINdowIDentify	Identifies the specified window on the output.
WindowLabelBackGroundCOLOR	Sets the color of the background behind a window label.
WindowLabelCOLOR	Sets the color of the label text.
WindowLabelENable	Turns a window label on or off.
WindowPresetDELete	Clears the specified preset register.
WindowPresetLIST	Lists the names of the specified preset.
WindowPresetLOAD	Loads the specified preset into the *DualView XL.*
WindowPresetNAME	Assigns a name to the specified preset.
WindowPresetSAVE	Saves the current window parameters to the specified preset
WindowSourceRectangle	Sets the source rectangle for the selected input.
ZooM	Activates the zoom utility.

Refer to the "Window Commands Descriptions" section for a complete description of all window positioning and visibility commands.

WINDOW COMMANDS DESCRIPTIONS

The table below lists all window positioning and visibility commands, their arguments and detailed descriptions.

Table 5-6. Window Commands Descriptions

Command	Arguments	Description
Dual**V**iew	[NORMAL | STRETCH | CROP]	Switches the *DualView XL* into a two window output display mode using one of three different arrangements. Use the NORMAL mode to display two side by side windows in letterbox mode with a normal aspect ratio. Use the STRETCH mode to display two side by side windows with aspect ratio stretched to fill the screen vertically. Use the CROP mode to display two side by side windows displayed in normal aspect ratio but with the sides cropped. Default": Normal
Dual**V**iew**M**ap	[<input#> <input#>]	Swaps the contents of the two windows. The first item in the list represents the input assigned to the left hand window of a DualView window arrangement. The second item is the input assigned to the right hand window of a DualView window arrangement. NOTE: The same input number cannot be assigned to two windows. Default: 1,2
FRee**Z**e	<window # | ALL> <ON | OFF>	Turns freeze status of the selected window **on** or **off**. Changes to the Brightness, Contrast, Saturation, Hue and Filter parameters made during a freeze, will not be applied until after the Freeze is turned off. **Note**: Any change to the output timing resets the freeze status to off. Default: **OFF**
OVer**S**can	<window #> <ON | OFF>	Performs an automatic 2% enlargement on video inputs only. It has no effect on **WSR** values, and it applies to all video inputs for the specified channel. **Overscan** is useful in trimming out excess blanking in video signals, or "head switching" for VTR sources. Unlike **WSR**, when **Overscan** is turned on, the enlargement is automatic and constant even when switching between the various video input types. Default: **OFF**
PAN	<window #> [<i | j | m | l> <repetition>]	Activates the pan function for the selected window. Only a zoomed input can be panned. Controls are listed below: **i** = pan up **m** = pan down **j** = pan left **l** = pan right **q** = quit

Table 5-6.   Window Commands Descriptions(Continued)

Command	Arguments	Description
POSition	<window #> [<direction> <repetition>]	Activates the position function, allowing you to move the specified input window around the output display. Controls are listed below:
		i = move up
		m = move down
		j = move left
		l = move right
		q = quit
		The **direction** and **repetition** arguments allow you to repeat a movement in one direction without repeatedly pressing the key. For example, to move window 1 to the left 20 times, type:
		` POS 1 j 20`
		The actual pixel or line increments that a window moves is determined by the **Setrate** command. In the above example, the window moves 40 pixels to the left (20 times the default rate of 2 pixels).
		Position affects the **WDR** value for the input.
PRIority	<window # | ALL> [<1...4>]	Priority numbers run from one through four. Priority one is the highest level, meaning that a window with priority one appears "in front of" all other windows. No two inputs can have the same priority level.
		If a window's priority is increased, the window previously at that level moves down one, and if necessary, lower priority windows also move down.
		The **All** argument allows you to query or change the priority level for all inputs at once.
Reset**S**ource**R**ectangle	<window #>	Resets the source rectangle (**WSR**) to default value that is equal to the HACT and VACT measurements of the specified input signal. Note **RSR** "unzooms" a zoomed image.
SETRATE	<x-rate> <y-rate>	Determines the number of pixels (x-rate) or lines (y-rate) a window will move with the **Position** command.
		Default: $x = 2$, $y = 2$
SIZE	<window #>	Activates the size utility, allowing you to resize the specified input window. Controls are:
		s = smaller
		l = larger
		q = quit
		Size affects the WDR value for the input.
UNder**S**can	<window #> [ON | OFF]	Turns on or off the Underscan feature for the specified window. When enabled, it expands the displayed image to include part of the blanking interval.
Video**A**spect**R**atio	<window #> [NORMAL | WS1 | WS2 | WS3 | WS4]	Identifies inputs with letterbox displays so that they may be displayed without black borders. Valid for video inputs only. Use this command when using a wide screen display with letterboxed video.
		Normal = 1.33:1
		WideScreen1 = 1.66:1
		WideScreen2 = 1.78:1
		WideScreen3 = 1.85:1
		WideScreen4 = 2.35:1
		Default: **NORMAL**

Table 5-6.   Window Commands Descriptions(Continued)

Command	Arguments	Description

Window**D**estination**R**ectangle	<window #> <x> <y> <width> <height>	Sets both the position and size of an input's destination rectangle.
		• The **<x>** and **<y>** arguments represent the monitor coordinates of the rectangle's top left corner, but hardware limitations may cause the actual placement to differ slightly from that specified. (When you read **WDR** for any window, the numbers given accurately reflect the hardware state.)
		• The **<width>** and **<height>** arguments represent the pixel width and line height of the destination rectangle. **width** range is 1..1920, **height** range is 1..1440.
		The rectangle can be positioned and sized so that part of it is positioned off screen. **WDR** is limited to the output resolution of the *DualView XL* (full screen display).
		Example: With an output host resolution of 1024 x 768, set window 4 to full screen:
		`>WDR 4 0 0 1024 768`
		Example: Place a 100 pixel by 100 line video window at column 300, line 400 on the monitor for input window 2:
		`>WDR 2 300 400 100 100`

Window**B**order**COLOR**	<window # | ALL> [<red> <green> <blue>] | [WHITE | YELLOW | CYAN | GREEN | MAGENTA | RED | BLUE | BLACK]	Sets the color of the border around the specified window. The user can set the color by setting the red, green, blue values (0...255) or using the pre-defined color values White, Yellow, Cyan, Green, Magenta, Red, Blue or Black. Query or set all the current setting for all borders by using the command **WBCOLOR ALL**
Window**B**order**WIDTH**	<window # | ALL> [0...100]	Sets the border width around the specified window. The size is set in terms of pixels. To turn the border off set the size to zero. Default: **0**
WINdow**EN**able	<window # | ALL> [<ON |OFF> [duration]]	Turns the specified window on or off. The **WINEN ALL** command is used to turn all windows on or off simultaneously. Each window may be faded using the optional duration parameter (range 0.1 .. 5.0 seconds). Default: **ALL ON**
Window**L**abel**B**ack**G**round **COLOR**	<window # | ALL> [<red> <green> <blue>] | [WHITE | YELLOW | CYAN | GREEN | MAGENTA | RED | BLUE | BLACK]	Sets the color of the background behind the label text for the specified window label. The user can set the color by setting the red, green, blue values (0...255) or using the pre-defined color values White, Yellow, Cyan, Green, Magenta, Red, Blue or Black.
Window**L**abel**COLOR**	<window # | ALL> [<red> <green> <blue>] | [WHITE | YELLOW | CYAN | GREEN | MAGENTA | RED | BLUE | BLACK]	Sets the color of the text for the specified window label. The user can set the color by setting the red, green, blue values (0...255) or using the pre-defined color values White, Yellow, Cyan, Green, Magenta, Red, Blue or Black.

Table 5-6. Window Commands Descriptions(Continued)

Command	Arguments	Description
Window**L**abel**EN**able	<window#	ALL> <ON| OFF>	Turns on or off the specified label. The label appears in the lower border area if the border is turned ON. If the border is turned OFF the label will be overlaid at the bottom center edge of the specified window. The color of the border surrounding the label and the color of the window text can be changed independently. See Window Label Color and **W**indow**L**abel**B**ack**G**round**COLOR** for details.
Window**L**abel**NAME**	<window #> ["label"]	Provides the label name for the specified window. A window label can be up to 23 characters in length.
WINdow**ID**entify	<window#>	Identifies the specified window on the output. The output returns to the previous state after a period of approximately 2 seconds.
Window**P**reset**DEL**ete	<1...10>	Clears the specified preset register.
Window**P**reset**LIST**	<1...10	ALL>	This command preset lists details about the source and destination rectangles saved for each window as well as border size and labels. Empty presets entries are not shown. Use the argument **ALL** to list of all preset names.
Window**P**reset**LOAD**	<1...10 >	Loads the specified preset into the *DualView XL.*
Window**P**reset**NAME**	<1...10> [name]	Assigns a name to the specified preset. The name is a string of up to 23 characters in length and may consist of any readable ASCII character except for spaces. See also: **WindowPresetLIST**.
Window**P**reset**SAVE**	<1...10 >	Saves the current window source and destination parameters to the specified preset.

Table 5-6. Window Commands Descriptions(Continued)

Command	Arguments	Description

Window**S**ource**R**ectangle	<input#> <x> <y> <width> <height>	Sets the source rectangle for the selected input. The source rectangle is the portion of the original input that is displayed on screen.
		• By default, `WSR` is set to show the entire image. That is, the default value for RGB inputs is equal to the HACT and VACT measurements of the specified input signal.
		• For video, `WSR` defaults to 720x480 for NTSC and 720x574 for PAL.
		The source rectangle is used to zoom in or out on an image. The `<x>` and `<y>` coordinates represent the coordinate screen starting point from which to draw the supplied values of `<width>` and `<height>`.
		Example: To zoom in on the upper left quadrant of an 800x600 input, **WSR** values are:
		`wsr <input#> 0 0 400 300`
		Example: To display only the bottom right quadrant, **WSR** values are:
		`wsr <input#> 400 300 400 300`
		Example: The full, default source rectangle for this 800x600 input is:
		`wsr <input#> 0 0 800 600`
		Note that since the horizontal and vertical size can be adjusted independently, this command can be used to stretch or squeeze an image.
		`WSR` resets to the default value whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal — or if you change the input type on a single channel (using `INputTYPE`), then `WSR` resets to the default values for the newly acquired signal.

Zoo**M**	<window #> [<i | o> <repetition>]	Activates the zoom utility. `Zoom` affects the `WSR` value for the input. Controls are: `i` = zoom in `o` = zoom out `q` = quit Zoom range is to a single pixel. `Zoom` resets to an unzoomed state whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal or if you change the input type setting on a single channel (using `InputType`), then `Zoom` resets to the default values for the new signal.

**IMAGE CONTROL
COMMANDS**

After you have made adjustments with the Input commands, you can use the Image Control commands to adjust parameters such as, brightness, contrast and color. A summary of commands is listed below. Click the desired command to access detailed instructions.

Table 5-7. Image Control Commands Summary

Command	Description
BRIght	Sets the brightness value of the selected input.
CONTrast	Sets the contrast value of the selected input.
GAMma	Sets a gamma value for the *DualView XL*.
HUE	Sets the hue value of the selected input.
SATuration	Sets the saturation value of the selected input.
SHARPness	Enables or disables the filter for the selected input.

Refer to the "**Image Control Commands Descriptions**" section for a complete description of all image control commands.

IMAGE CONTROL COMMANDS DESCRIPTIONS

The table below lists all image control commands, their arguments and detailed descriptions.

Table 5-8. Image Control Commands Descriptions

Command	Arguments	Description
BRIght	<input#	ALL> <-500…500>	Sets the brightness value of the selected input. The `ALL` argument sets brightness for all four inputs. Default: `0`
CONTrast	<input#	ALL> <0…200>	Sets the contrast value of the selected input. The `ALL` argument sets contrast for all four inputs. Default: `100`
GAMma	<0.5…2.0>	Sets a gamma value for the *DualView XL* output. The translation between electrical input and light output of display devices varies by the type of device. This command is used to match the *DualView XL* to the display connected to the output. Changing the gamma affects the gamma of all windows. Default: `1.0`
HUE	<input#	ALL> <-180…180>	Sets the hue value of the selected input. Use the ALL argument to set the hue for all inputs simultaneously. Default: `0`
SATuration	<input#| ALL> <0…200>	Sets the saturation value of the selected input. Use the ALL argument to set the hue for all inputs simultaneously. Default: `100`
SHARPness	<input#> [-5...5]	Sets the sharpness setting for the selected input. Positive values sharpen the image and negative values soften the image. A value of zero sets the sharpness OFF. Default: **0**

SERIAL PORT

COMMANDS

Serial Port Commands are used to control the baud and echo settings. A summary of commands is listed below. Click the desired command to access detailed instructions.

Table 5-9. Serial Port Commands Summary

Command	Description
BAUDrate	Sets the serial port *baud* rate.
ECHO	Turns the serial echo On/Off.

Refer to the "**Serial Port Commands Descriptions**" section for a complete description of all serial port commands.

SERIAL PORT COMMANDS DESCRIPTIONS

The table below lists all serial port commands, their arguments and detailed descriptions.

Table 5-10. Serial Port Commands Descriptions

Command	Arguments	Description
BAUDrate	< 9600 | 19200 | 38400 | 57600 | 115200>	Sets the serial port *baud* rate. The value is automatically saved in NVRAM. Default: `9600`
ECHO	<ON | OFF>	Turns the serial echo On/Off. The value is saved in the NVRAM. The `echo` is only present on commands typed and sent to the unit from the serial port. There is no echo on a Telnet connection. **Note:** The `Echo` setting has no effect on responses issued by the *DualView XL*; responses are always visible, regardless of the `echo` status. Default: `ON`

NETWORK COMMANDS

Network Commands control the settings for the *DualView XL*'s Ethernet port. The values used in this section are typically provided by your facility's IT specialist. A summary of commands is listed below. Click the desired command to access detailed instructions.

Table 5-11.   Network Commands Summary

Command	Description
IPADDRess	Sets the IP address for the *DualView XL*.
IPSubNET	Sets the IP subnet mask for the *DualView XL*.
IPGateWay	Sets the *DualView XL*'s IP default gateway.
MACADDRess	Displays the *DualView XL* Ethernet MAC address

Refer to the "**Network Commands Descriptions**" section for a complete description of all network commands.

NETWORK COMMANDS DESCRIPTIONS

The table below lists all network commands, their arguments and detailed descriptions.

Table 5-12.   Network Commands Descriptions

Command	Arguments	Description
IPADDRess	[ddd.ddd.ddd.ddd]	Sets the IP address for the *DualView XL*. To determine the current IP address, enter the command without an IP address. **Note:** New IP address settings will not be applied until after a system reset. See also **IPGateWay** and **IPSubNET**. Default: `192.168.1.200`
IPSub**NET**	[ddd.ddd.ddd.ddd]	Sets the IP subnet mask. This setting may need to be changed to suit the configuration of your network. To determine the current IP subnet setting, enter the command without the subnet mask. Default: `255.255.255.0`
IPGate**W**ay	[ddd.ddd.ddd.ddd]	Sets the IP default gateway. This setting may need to be changed to suit your network's configuration. To determine the current IP gateway, enter the command without an address. Default: `192.168.1.1`
MACADDRess		Display the current Ethernet MAC address. NOTE: This is a read only command.

MISCELLANEOUS COMMANDS

The Miscellaneous commands category control includes a variety of general *DualView XL* functions. A summary of commands is listed below. Click the desired command to access detailed instructions.

Table 5-13. **Miscellaneous Commands Summary**

Command	Description
BackGroundSouRCe	Selects a colored background that appears behind the windows. Provides a choice between solid and shaded background colors.
Help	Displays the entire serial command set or provides help on specific command.
ID	Displays the following *DualView XL* product information. • Product Type • Date of manufacture • Serial number • Firmware revision number • IP settings • Configurations (options)
RestoreFactoryDefaults	Restores all user settings to their factory default values.
RECALLCONFIGuration	Recalls configuration parameters that were manually saved.
SAVECONFIGguration	Forces an update and explicit save of the system's NVRAM.
SETTINGSEXPORT	Exports an ASCII file of system settings to the terminal or controller.
SETTINGSIMPORT	Accepts ASCII data relating to system settings.
STATus	Returns the Status of the *DualView XL* and its current settings.
TestPattern	Turns on the designated TestPattern.
UpdateFirmWare	Updates the firmware for the *DualView XL*.
VERsion	Returns firmware, hardware, and bootcode revision information.

Refer to the "**Miscellaneous Commands Descriptions**" section for a complete description of all miscellaneous *DualView XL* commands.

MISCELLANEOUS COMMANDS DESCRIPTIONS

The table below lists all miscellaneous commands, their arguments and detailed descriptions.

Table 5-14. MIscellaneous Commands Descriptions

Command	Arguments	Description
Back**G**round**S**ou**RC**e	[<red> <green> <blue>] | [WHITE | YELLOW | CYAN | GREEN | MAGENTA | RED | BLUE | BLACK RedRAMP | GreenRAMP | BlueRAMP | WhiteRAMP | HRedRAMP | HGreenRAMP | HBlueRAMP | HWhiteRAMP]	Selects a shaded background or a solid background. RedRAMP provides a red background shaded from top to bottom of the output. HRedRAMP provides a red background that is shaded from left to right. To select a solid background color enter the RED, GREEN or BLUE color values (0..255) for the required color or select one of the eight pre-defined saturated colors. To turn off a shaded background use **BGSRC 0 0 0** or the BackgroundColor command **BGC BLACK**
Help	[<command>]	`Help`, without an argument, displays the entire serial command set. `Help`, with a command as an argument, displays detailed information about that command.
ID	(none)	Displays the following information: • Product name • Product identification • Firmware version number • Manufacturing date • Serial number
Restore**F**actory**D**efaults	(none)	Restores all user settings to their factory default values and restarts the system.
RECALLCONFIGuration	(none)	Manually recalls (restores) customer configuration parameters that were manually saved by the `SaveConfiguration` command. **Note:** The configuration is automatically saved after every change. The system configuration is automatically restored following a power cycle. This command could be used as the user specified alternative to `Restore Factory Defaults`. See also: **SAVECONFIGguration**.
SAVECONFIGguration	(none)	Forces an update and explicit save of the system's NVRAM. This is used to provide user defined default settings. **Note:** These settings are loaded only when the `RECALLCONFIGURATION` command is used. The configuration that is loaded following a power cycle represents the state of the machine prior to loss of power, not those saved by the `SaveConfiguration` command. See also: **RECALLCONFIGuration**.

Table 5-14. MIscellaneous Commands Descriptions(Continued)

Command	Arguments	Description
SETTINGSEXPORT	[TIMING | WINDOW | SYSTEM | ALL] [filename]	This command provides the ability to store *DualView XL* settings on to an external computer. This is useful in backing up settings, or providing the ability to "clone" the settings on multiple *DualView XL* devices. Storing this data is a two step process. • Create a text file named "export.txt" that is stored in *DualView XL* memory. • Upload this file to your PC. NOTE: You can specify your own file name using the optional filename argument. To save timing, window and system parameters together use the ALL option (Issuing the command without an argument will also accomplish this). Alternatively you can save just the TIMING, WINDOW or SYSTEM parameters. If you wish to save only the user defined timing values, use the TIMING argument. If you wish to save only the WINDOW PRESET parameters for each active WINDOW PRESET, use the WINDOW argument. If you wish to save only the SYSTEM parameters for the current SYSTEM settings use the SYSTEM argument (note that this does not include the settings saved in the SAVECONFIG register). To save your settings use the following procedure: • Create the file using the SETTINGSEXPORT command from the telnet or serial port. • Log in to the ftp server in *DualView XL*. • Use the ftp command "get export.txt" to move the file from the *DualView XL* to your PC. • Type "close" to log out of the ftp server See also: **SETTINGSIMPORT**.
SETTINGSIMPORT	[filename]	This command provides the ability to restore or set system settings (or cloning a new system) to match the configuration of a different *DualView XL* unit. Accepts the text file created using the **SETTINGSEXPORT** command. If the filename is not specified, the default filename"export.txt' is assumed. Use the following procedure to import settings from your PC. • Log in to the *DualView XL* using ftp from your PC • Type the command "put <filename>" to place the file into the *DualView XL* memory. (<filename> is the name of the file created using the SETTINGSEXPORT command). • Type "quit" to log out of the *DualView XL* ftp server. • From the telnet or serial port issue the command SETTINGSIMPORT <filename>. Note that if you use the default filename "export.txt you do not need to specify the filename. See also: **SETTINGSEXPORT**.
STATus	(none)	Returns details about the current graphics input signals that are applied to each *DualView XL* graphics input.

Table 5-14. MIscellaneous Commands Descriptions(Continued)

Command	Arguments	Description
Test**P**attern	[<OFF | BARS | HBARS | GRID | RAMPS | DVI | SNOW>]	Turns on the designated TestPattern (moving bars, grayscale, or color bars). Use the **OFF** argument to turn the TestPattern off. Default: **OFF**
Update**F**irm**W**are	(none)	Loads new firmware into the *DualView XL*. This is a two step process. • The new firmware must be first be downloaded to the *DualView XL*. • Load the new firmware use the **UFW** command. • See Appendix A for further information.
VERsion	(none)	Returns firmware, hardware, and bootcode revision information.

TIMING PARAMETERS

The table below lists timing parameters, values and ranges used for both the input and output timing functions. Advanced users can also use the table to assist with values listed in the "**Output Format List**."

For example, if you type **INT** <input #> to query the system's **Input Timing** values, you will get a string of values (<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>) that represent *DualView XL*'s settings for that input. The table below will greatly assist in clarifying each value's meaning.

Note	Internally, *DualView XL* maintains two separate lists of timing parameters — one for inputs and one for output timings. However, the parameter definitions and ranges are identical for both lists.

Table 5-15. Definitions and Ranges for Timing Parameters

Parameter	Definitions	Ranges	Comments
HFP	Horizontal front porch	0 to 640 pixels	The beginning of the horizontal blanking interval.
HS	Horizontal sync	16 to 640 pixels	The width of the horizontal synchronizing pulse
HBP	Horizontal back porch	0 to 640 pixels	The end of the horizontal blanking interval. The total horizontal blanking = HFP + HS + HBP.
HACT	Horizontal active	16 to 1920 pixels	The active picture interval (non-blanked portion of the image). The total pixel count per line = HACT + HFP + HS + HBP.
VFP	Vertical front porch	0 to 512 lines	The part of vertical blanking prior to the vertical sync.
VS	Vertical sync	2 to 32 lines	The width of the vertical sync period.
VBP	Vertical back porch	0 to 512 lines	The part of the vertical blanking signal following the vertical sync interval.
VACT	Vertical active	12 to 1440 lines	The number of active lines of picture.
VTOT	Total Vertical line count	NA	This parameter is measured by *DualView XL*. Users may not define this value, but the sum of VFP + VS + VACT must equal VTOT.
HFREQ	Horizontal frequency in Hz	12.5 to 125 kHz	This parameter is measured by *DualView XL*. This is a read only parameter.

Table 5-15. **Definitions and Ranges for Timing Parameters(Continued)**

Parameter	Definitions	Ranges	Comments
SYNC	Sync format	3, 4, or 5 wires	This command applies to analog RGB inputs only. In 3 wire sync systems the H & V sync signals are combined with the Green signal. In 4 wire sync systems the H&V sync signals are combined and transmitted on a dedicated wire. 5 wire systems the H & V signals are transmitted on separate dedicated wires.
HPOL	Horizontal sync polarity	1 or 0	The value "1" represents positive sync polarity and the value "0" represents negative sync polarity. Typically the horizontal and vertical sync have the same polarity. Note that three wire sync is always negative polarity.
VPOL	Vertical sync polarity	1 or 0	The value "1" represents positive sync polarity and the value "0" represents negative sync polarity. Note that three wire sync is always negative polarity.
IL	Interlaced/Noninterlaced	1 or 0	The value "1" represents interlaced scan and "0" represents non-interlaced (progressive) scan. Note that video signals are typically interlaced, and graphics signals are typically non-interlaced.

OUTPUT FORMAT LIST

The table below lists all of *DualView XL*'s preset output format settings. User defined settings can also be added to this list. These settings are used to match the system's output to that of your display device. In Chapter 2, refer to the "**Timing Adjustments**" section for instructions on using the list.

Columns are provided for the timing ID, plus all of the individual parameters such as frequency, sync, polarity, interlace and many more. Refer to the "**Timing Parameters**" section for a detailed explanation of each parameter.

Please note:

- Because all parameters can be modified with the "**OutPutTiMing**" function, advanced users can "tweak" output settings and then store them in the first ten registers, using the "**OutPutTiMingSAVE**" function.

- Custom settings can also be named using the "**OutPutTiMingNAME**" function.

- If desired, print this list and keep a record of any user-defined settings that you configure.

Table 5-16. Output Format List

ID	TYPE	HFP	HS	HBP	HACT	HFRQ	VFP	VS	VBP	VACT	SYNC	HPOL	VPOL	IL
1	VESA 640 x 350 @ 85Hz	32	64	96	640	37.861	32	3	60	350	5	1	0	0
2	VESA 640 x 400 @ 85Hz	32	64	96	640	37.861	1	3	41	400	5	0	1	0
3	VESA 720 x 400 @ 85Hz	36	72	108	720	37.927	1	3	42	400	5	0	1	0
4	VESA 640 x 480 @ 60Hz	16	96	48	640	31.473	10	2	33	480	5	0	0	0
5	VESA 640 x 480 @ 72Hz	24	40	128	640	37.861	9	3	28	480	5	0	0	0
6	VESA 640 x 480 @ 75Hz	16	64	120	640	37.500	1	3	16	480	5	0	0	0
7	VESA 640 x 480 @ 85Hz	56	56	80	640	43.269	1	3	25	480	5	0	0	0
8	VESA 800 x 600 @ 56Hz	24	72	128	800	35.156	1	2	22	600	5	1	1	0
9	VESA 800 x 600 @ 60Hz	40	128	88	800	37.879	1	4	23	600	5	1	1	0
10	VESA 800 x 600 @ 72Hz	56	120	64	800	48.077	37	6	23	600	5	1	1	0
11	VESA 800 x 600 @ 75Hz	16	80	160	800	46.875	1	3	21	600	5	1	1	0
12	VESA 800 x 600 @ 85Hz	32	64	152	800	53.674	1	3	27	600	5	1	1	0
13	VESA 1024 x 768 @ 60Hz	24	136	160	1024	48.363	3	6	29	768	5	0	0	0
14	VESA 1024 x 768 @ 70Hz	24	136	144	1024	56.476	3	6	29	768	5	0	0	0
15	VESA 1024 x 768 @ 75Hz	16	96	176	1024	60.023	1	3	28	768	5	1	1	0
16	VESA 1024 x 768 @ 85Hz	48	96	208	1024	68.677	1	3	36	768	5	1	1	0
17	VESA 1152 x 864 @ 75Hz	64	128	256	1152	67.500	1	3	32	864	5	1	1	0
18	VESA 1280 x 960 @ 60Hz	96	112	312	1280	60.000	1	3	36	960	5	1	1	0
19	VESA 1280 x 960 @ 85Hz	64	160	224	1280	85.938	1	3	47	960	5	1	1	0
20	VESA 1280 x 1024 @ 60Hz	48	112	248	1280	63.981	1	3	38	1024	5	1	1	0
21	VESA 1280 x 1024 @ 75Hz	16	144	248	1280	79.976	1	3	38	1024	5	1	1	0
22	VESA 1600 x 1200 @ 60Hz	64	192	304	1600	75.000	1	3	46	1200	5	1	1	0
23	EIA-343-A 675 lines	16	56	64	832	20.253	2.5	2.5	20	312	4	1	1	1

ID	TYPE	HFP	HS	HBP	HACT	HFRQ	VFP	VS	VBP	VACT	SYNC	HPOL	VPOL	IL
24	EIA-343-A 729 lines	20	64	80	900	21.870	2.5	2.5	22	337	4	1	1	1
25	EIA-343-A 875 lines	26	96	118	1080	26.245	3	3	27	404	4	1	1	1
26	EIA-343-A 945 lines	36	112	140	1164	28.343	3	3	29	437	4	1	1	1
27	EIA-343-A 1023 lines	44	136	164	1260	30.692	4	4	30	473	4	1	1	1
28	720 x 480, 29.97i	16	61	61	720	15.734	3	3	14	242	3	0	0	1
29	720 x 576, 25i	12	66	66	720	15.625	2.5	2.5	20	287	3	0	0	1
30	960 x 480, 29.97i	23	69	92	960	15.734	3	3	14	242	3	0	0	1
31	960 x 576, 25i	23	69	100	960	15.625	2.5	2.5	20	287	3	0	0	1
32	1280 x 720, 24	70	40	260	1280	18.000	5	5	20	720	3	0	0	0
33	1280 x 720, 30	70	40	260	1280	22.500	5	5	20	720	3	0	0	0
34	1280 x 720, 60	70	40	260	1280	45.000	5	5	20	720	3	0	0	0
35	1920 x 1080, 24i	594	44	192	1920	27.000	2	5	15.5	540	3	0	0	1
36	1920 x 1080, 24p	594	44	192	1920	27.000	4	5	36	1080	3	0	0	0
37	1920 x 1080, 30i	44	44	192	1920	33.750	2	5	15.5	540	3	0	0	1
38	1920 x 1080, 30p	44	44	192	1920	33.750	4	5	36	1080	3	0	0	0
39	1920 x 1080, 60p	44	44	192	1920	67.500	4	5	36	1080	3	0	0	0
40	1920 x 1035, 30i	44	44	192	1920	33.750	5	5	35.5	517	3	0	0	1

NOTE:

Timing list entries 1 - 40 are factory defined timing parameters.

Timing list entries 41 - 99 are reserved for future pre-defined parameters.

Timing list entries 100-160 are for user defined timing list entries.
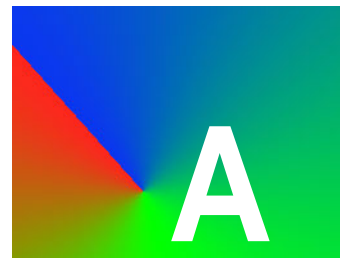
FIRMWARE UPDATES AND TROUBLESHOOTING

The following topics are discussed in this chapter:

- **Firmware Upgrades**
- **System Troubleshooting**

FIRMWARE UPGRADES

The following topics are discussed in this section:

- **Firmware Version & Updates**
- **Updating System Firmware**

FIRMWARE VERSION & UPDATES

From time to time, new features or improvements are made to the *DualView XL* firmware. Your *DualView XL*'s system firmware can be updated directly on site as soon as you have a copy of the new firmware. Please visit our website (**http://www.rgb.com**) support section for information about recent changes and firmware version numbers.

You can identify your current firmware version numbers from the SYSTEM page on your *DualView XL* web interface or use the command VER from the command line interface.

UPDATING SYSTEM FIRMWARE

NOTE: The firmware updated process is different from prior RGB products. Make sure that you follow these instructions **exactly!**

The firmware version in the *DualView XL* can be field updated **only** via the Ethernet port. This means that your PC will need to be connected to the *DualView XL* directly or through a network connection.

The following two items are required for this procedure:

- Computer configured for a 10/100BASE-T network connection.
- Current firmware update file and update instructions.

Important	Do not update your firmware without these two items. If you want to update using a direct connection from a PC to the *DualView XL* (not using a network) then be sure to use a crossover cable. See page 19 for further details.

Firmware can be updated by using either a Web browser, or by a command line interface using the standard file transfer protocol ftp. Both of these methods are described in the following section.

UPDATE FROM A WEB BROWSER (FTP)

The upgrade procedure is a two step process.

The most convenient way to upgrade the firmware is to use a standard web browser using ftp. You will also need to use a serial or telnet terminal to finalize the upgrade process.

 Use the following procedure to update your firmware using your web browser:

Step 1. **Transfer the new firmware to** *DualView XL*

- Connect the *DualView XL* to the PC using the Ethernet port either directly or via a network

- Launch your web browser, and in the browser address bar type the following address:
  ftp://<ip address>, where <ip address > represents the IP address of the *DualView XL* that you are intending to upgrade.

- ▲ Example - if the ip address of your *DualView XL* is 192.168.1.200 type **ftp://192.168.1.200**

- At the login screen type '**rgb**' for user name and "**spectrum**' for the password (be sure to use lower case characeters).

- Cut and paste the upgrade file 'fwop_x.xx.tar,' into the browser page (where x.xx represents the version number). Alternatively drag the file and drop onto the browser page.

- Check that the file is now shown in the browser page.

Step 2. **Load the new firmware**

- Connect your PC to the *DualView XL* via the serial port.

- From the *DualView XL* command line prompt type the command '**ufw**'.

- The *DualView XL* will ask for confirmation that you wish to proceed. Press '**y**' to continue or '**n**' to halt the process.

- *DualView XL* will proceed with loading the files.

- When the loading process has completed you will see the message "**you may now restart the system**" .

- Press the front panel reset switch ("Reset Button" on page 9), or cycle the power by switching the power switch off and on again.

- Wait a few seconds for the system to start, and verify that the new firmware is loaded by typing the command '**ver**' from the *DualView XL* command line in your serial terminal emulator.

- If the update was successful close the browser window to end the ftp session.

UPDATE FROM A COMMAND WINDOW (FTP)

An alternate method to upgrade the firmware is to use the standard network file transfer protocol known as 'ftp'. The upgrade procedure is a two step process

Step 1. **Transfer the new firmware to** *DualView XL*

- Put the new version of firmware in a directory that you can access directly from the PC that you will be using for the update. The file name will be of the form 'fwop_x.xx.tar', where x.xxx represents the version number.
NOTE: Whenever you see reference to the file name fwop_x.xx.tar in this document, type the actual file name you will be upgrading to.

- Connect the *DualView XL* to the PC using the Ethernet port either directly or via a network.
NOTE: If you are connecting directly from your PC to the *DualView XL* you will need an Ethernet crossover cable.

- Open a Windows Command window and type the command '**ftp**' and press the **ENTER** key. This will open an ftp terminal.

- At the ftp prompt type the command '**open <ipaddress>**' and press the **ENTER** key (where <ipaddress> is the IP address of your *DualView XL*).

- If you have connected successfully in the command window you will see a message indicating that you are connected to the IP address of the *DualView XL*.

- At the prompt enter the user name '**rgb**' (lower case) and press the **ENTER** key. You will then be prompted for a password. Type '**spectrum**' and press the **ENTER** key. You should see the message '**230 User rgb logged in**' as shown in Figure A-1 below


```
C:\WINNT\system32\cmd.exe - ftp 192.168.1.125                          _ □ x

C:\>ftp 192.168.1.125
Connected to 192.168.1.125.
220 127.0.0.1 FTP server (Version wu-2.6.1(1) Thu Dec 19 02:32:49 PST 2002) ready.
User (192.168.1.125:(none)): rgb
331 Password required for rgb.
Password:
230 User rgb logged in.
ftp> _
```

Figure A-1.   Windows ftp login screen connected to *DualView XL*

- Type the command '**bin**' at the ftp prompt and press the **ENTER** key.

- Type the command '**put fwop_x.xx.tar**' (where x.xx represents the version number) and press the **ENTER** key. This will copy the firmware to the *DualView XL*.

- Type the command '**quit**' at the ftp prompt and press the **ENTER** key to close the ftp session.

Step 2. Load the new firmware

- Connect your PC to the *DualView XL* via the serial port.

- From the *DualView XL* command line prompt type the command '**ufw**' and press the **ENTER** key.

- The *DualView XL* will ask for confirmation that you wish to proceed. Press '**y**' to continue or '**n**' to halt the process.

- *DualView XL* will proceed with loading the new firmware. When the loading process has completed you will see the message "**you may now restart the system**".

- Press the front panel reset switch ("Reset Button" on page 9), or cycle the power by switching the power switch off and on again.

- Wait a few seconds for the system to start, and verify that the new firmware is loaded by typing the command '**ver**' from the *DualView XL* command line in your serial terminal emulator.

SYSTEM TROUBLESHOOTING

Problems with *DualView XL* operation may result from incorrect system connections and settings. In the event of difficulty or anomalous results, first check the following basic items:

- Cable connections

- The video format associated with each input

- The display device timing selected

- Any system options currently in effect

- Query the current settings of the parameter in question to determine *DualView XL*'s current values.

Some of these items are discussed in detail in the "**Troubleshooting Guide**" section below.

Important	*DualView XL*'s hardware should only be modified or repaired by RGB Spectrum's technicians.

TROUBLESHOOTING GUIDE

Use the table below to troubleshoot the *DualView XL*. If problems persist, refer to the "**How to Contact RGB Spectrum**" section (page 99) for technical support instructions.

Table A-1. Troubleshooting Guide

Symptom	Recommendations
No power or lights	Check that the *DualView XL* is plugged in and powered on.
No signal or a poor signal on the display.	Check that cables are connected correctly. Turn on a test pattern using the "**TestPattern**" function, and determine the quality of the output image. Make sure that an appropriate set of output parameters are loaded from the "**Output Format List**" for your current display.
No windows visible	•Ensure that at least one window is enabled using the "**WINdowENable**" function. •Ensure that windows are not obscuring each other. Turn all windows off using the "**WINdowENable**" function, then enable the window in which you are working. •Ensure that the window in which you are working has not been positioned off screen. Use the WSR and WDR query commands to determine where windows are positioned.

Table A-1.   Troubleshooting Guide(Continued)

Symptom	Recommendations
Windows have the wrong aspect ratio (i.e., are stretched) or are not positioned correctly	•Try selecting a different output from the "**Output Format List**" to better match your display. •Determine that there is not a mismatch between your output and the selected monitor display (e.g., 4:3 output and 16:9 display monitor). •Use the "**WindowSourceRectangle**" (WSR) and "**WindowDestinationRectangle**" (WDR) functions to check or modify the image's aspect ratio.
Blank video window (the window is black)	•Ensure that the window's video source is properly connected to the system, powered on and generating a signal. •Ensure that the correct type is selected (Composite, Component, S-Video or Digital) using the "**INputSouRCe**" command.
Frozen window(s)	If a window is frozen after system start-up, turn freeze off using the "**FReeZe**" command.
Missing window imagery	•Check the "**WindowSourceRectangle**" (WSR) value to ensure the entire image is being processed. •Check WSR and "**WindowDestinationRectangle**" (WDR) to ensure that the source and destination rectangles are delivering the entire video image.
Poor quality video	•Check the video source for proper operation. •Check that cables are in good condition and connectd correctly. •Ensure that video sources are not double terminated. Double termination can occur when one video source is split into two using a "T" connector instead of a distribution amplifier. •If you are using a VCR, check the quality of the tape. •Adjust the brightness using the "**BRIght**" command. •Adjust contrast using the "**CONTrast**" command. •Adjust saturation as required using the "**SATuration**" command. •Adjust the hue as required using the "**HUE**" command.
No color on the S-Video input	•Check that the saturation setting is set to normal. Adjust as necessary. •Check that the S-video cable is connected correctly. •Check that the window has S-Video selected as it's source. If you select Composite2 when you have an S-Video signal connected to this port, the input will be displayed as a black and white (luminance only) signal.
Aspect Ratio on a video input is incorrect.	Check the status of the "**VideoAspectRatio**" command. For a 4:3 aspect ratio signal, this should be set to normal.
No text on a terminal	•To see your own typed entries, enable the echo mode when using an ASCII terminal or terminal emulation program to control the system from the RS-232 port. •Use the "**ECHO**" command to enable or disable the echo mode. •When using an application program running on a computer to control the *DualView XL*'s functions over the RS-232 port, you may need to disable the echo mode. •Check baud rate and protocol settings. •Check cables are in good condition and connected correctly.

Table A-1.   Troubleshooting Guide(Continued)

Symptom	Recommendations
Unreliable control of the *DualView XL* from the RS232 port.	•See the recommendation immediately above. You may need to disable "**ECHO**." •Check that the "**BAUDrate**" for the *DualView XL* and your console device are set to the same speed.
Unable to connect to the *DualView XL* over the network.	•Check that the *DualView XL* is connected to the network using a standard Ethernet cable. •Check that you are using the correct IP address. •If you are unable to connect and are sure that IP address is correct, check the Subnet mask and make sure that it is suited to your network configuration. •If you believe the IP address and Subnet mask are correct but you still cannot connect, check that this is not a duplicate IP address. Use the IP "ping" command from the WINDOWS command window, and see if there is a response. If there is a response, turn off the *DualView XL* and ping the IP address again. If there is still a response, a duplicate address exists.
Unable to connect to the *DualView XL* directly from a PC (peer to peer connection).	•Check that the *DualView XL* is connected to the PC using an Ethernet cross over cable (A suitable cable is the Belkin Part # A3X126-07). •Check that you are using the correct IP address. •If you are unable to connect and are sure that the IP address is correct, check the IP settings of your PC. Many PCs are set to work with a DHCP server which is not present when connecting directly to the *DualView XL*. •If you believe the *DualView XL* IP address is correct and your PC has a valid IP address, but you still cannot connect, check that this is not a duplicate IP address. Use the IP "ping" command from the WINDOWS command window, and see if there is a response. If there is a response, turn off the *DualView XL* and ping the IP address again. If there is still a response, your PC has been set with the same address as the *DualView XL*.
After logging in to the WCP, unable to see theVirtual screen on the main page	•If the menu bar appears but the virtual screen does not appear in the main page, the Java Virtual Machine (JVM) may not be installed on your PC. This is available free of charge from the Sun Microsystems web site.

HOW TO CONTACT RGB SPECTRUM

RGB Spectrum can be reached via phone, fax, mail and e-mail as listed below:

- **RGB Spectrum**
  950 Marina Village Parkway
  Alameda, CA 94501

- Phone: (510) 814-7000

- Fax: (510) 814-7026

- E-Mail (technical support): support@rgb.com

- E-Mail (sales and product information): sales@rgb.com

- Website: **http://www.rgb.com**

CONNECTOR TYPES

B
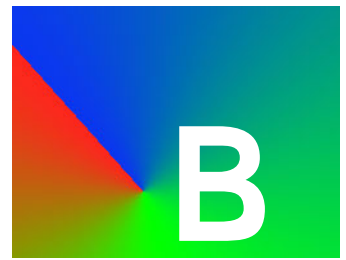
CONNECTORS AND PINOUTS

This chapter provides information about the signal and control connectors used in *DualView XL*.

- **Composite Video Connector**
- **S-Video Connector**
- **High Resolution Analog Connector**
- **DVI-I Connector**
- **Ethernet Connector**
- **RS-232 Connector**

COMPOSITE VIDEO CONNECTOR

The Composite video signal inputs use the industry standard 75 Ω BNC connector.

Signal conductor

Ground/Shield
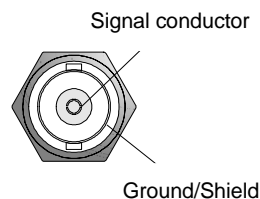
Figure B-1.   BNC connector (viewed from rear of chassis)

The BNC connector is designed for use with coaxial cables. Coaxial cables are well suited for the transmission of high frequency signals over moderate distances. Coaxial cable is commonly available with a characteristic impedance of either 50 or 75 Ω. Video signals exclusively use 75 Ω cable and connectors. For best signal quality it is important to use a high quality 75 Ω coaxial cable. The use of 50 Ω cable will cause a signal mismatch which may result in visible artifacts on video images.

Ready made cables are available commercially or can be easily customized on site to suit your particular requirements.

**S-VIDEO
CONNECTOR**

S-Video signals are generally of higher quality than analog composite video signals. Composite video signals combine the black and white (monochrome) signals together with color information on a single coaxial cable. S-Video signals, however, use two signal wires to keep the luminance (black and white) and chrominance (color information) signals separated.

CONNECTOR TYPE AND PINOUTS

DualView XL uses the standard 4 pin mini-DIN connector allowing the use of standard, commercially available cables. The pinout for the standard S-Video connector is shown in the figure below.:
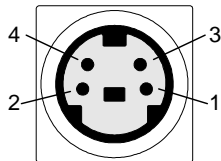
Figure B-2.   S-Video connector (viewed from rear of chassis)

The 4-pin mini-DIN connector has the following signals:

Table B-1.   S-Video Connector Pinouts

Pin	Signal	Description
1	Y (Luminance) Ground	Y shield
2	C (Chrominance) Ground	C shield
3	Y (Luminance) Signal	Y signal
4	C (Chrominance) Signal	C signal
Shield	Chassis ground	Ground

CABLE LENGTH

S-Video cables tend to be higher loss than the standard coaxial cable used for composite video which means that for best results cable lengths should be kept to a minimum. S-Video cables are available commercially.

Analog graphics signals are connected to the *DualView XL* using a standard connector. In graphics applications, the signals are typically transmitted as separate Red (R), Green (G) and Blue (B) signals. Television signals are also sometimes transmitted in component form, but typically use a different format of signal — using brightness (Y) and color difference signals (U,V). The *DualView XL* can accept either types of signal from the high resolution input connector.

CONNECTOR TYPE AND PINOUTS

The high resolution (RGB / YUV) inputs are connected using a sub miniature 15 pin D-type (HD-15), as shown below. This connector is often referred to as a VGA or VESA connector, and supports the VGA, SVGA, XGA, SXGA and UXGA signals.
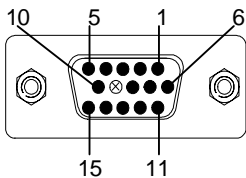
Figure B-3.   RGB Analog Connector (viewed from rear of chassis)

The table below lists signals for the 15 pin D-type (HD-15) connector, including the pinout for the RGB analog input and the correct connections for YUV inputs. Note that the analog input supports both RGB and YUV signals.

Table B-2.   RGB Analog Video Connector Pinouts

Pin	Signal	Description
1	R	Red signal (alternatively used for V)
2	G	Green signal (alternatively used for Y)
3	B	Blue signal (alternatively used for U)
4	NC	ID2 (not used)
5	NC	GND TEST
6	Ground	Red ground
7	Ground	Green ground
8	Ground	Blue ground
9	no pin (key)	
10	Chassis ground	Ground
11	NC	ID 0 (not used)
12	NC	ID1 (not used)

Table B-2. **RGB Analog Video Connector Pinouts(Continued)**

Pin	Signal	Description
13	CS/HS	Composite Sync or Horizontal Sync
14	VS	Vertical Sync
15	NC	ID3 (not used)

CABLE LENGTH

High quality RGB or YUV signals have very high signal bandwidths. Cable lengths should be kept as short as possible as longer cable lengths attenuate the signal more severely at higher bandwidths.

DVI-I CONNECTOR

The DVI connector is used to interconnect graphics devices. This is a standard connector based on the work of the Digital Display Working Group (DDWG).

CONNECTOR TYPE AND PINOUTS

The connector used in the *DualView XL* is a 29-pin DVI-I connector, supporting both analog and digital signals. The DVI-I connector (as shown below) is used for the standard *DualView XL* DVI output signals and the optional digital DVI input signals.
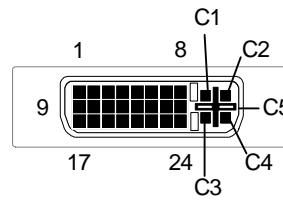
Figure B-4.   DVI-I Digital/Analog Connector (viewed from rear of chassis

The 29 pin DVI-I connector has the following signals:

Table B-3.   DVI-I Connector Pinouts

Pin	Signal	Description
1	TMDS Data 2-	
2	TMDS Data 2+	
3	TMDS Data 2/4 shield	
4	NC	Defined for Dual Link only
5	NC	Defined for Dual Link only
6	DDC Clock	
7	DDC Data	
8	Analog Vertical Sync	Horizontal sync is on pin C4
9	TMDS Data 1-	
10	TMDS Data 1+	
11	TMDS Data 1/3 shield	
12	NC	Defined for Dual Link only
13	NC	Defined for Dual Link only
14	+5V Power	5 V fused @ 300mA.
15	Ground	
16	Hot Plug detect	

Table B-3. **DVI-I Connector Pinouts(Continued)**

Pin	Signal	Description
17	TMDS Data 0-	
18	TMDS Data 0+	
19	TMDS Data 0/5 shield	
20	NC	Defined for Dual Link only
21	NC	Defined for Dual Link only
22	TMDS Clock shield	
23	TMDS Clock+	
24	TMDS Clock-	
C1	Analog Red	Red signal
C2	Analog Green	Green signal
C3	Analog Blue	Blue signal
C4	Analog H sync	Analog Horizontal Sync signal
C5	Analog Ground	Common analog ground (R,G,B, sync)

INPUT CABLES

The standard *DualView XL* provides a standard 15 pin sub miniature D connector for the analog input signals (see the "**High Resolution Analog Connector**" section on page 103 for details). Digital Graphics inputs can be connected using the DVI input option. Standard cables are available commercially for various lengths to allow connection to DVI graphics outputs.

OUTPUT CABLES

Both the digital and analog outputs of the *DualView XL* are provided on the DVI output connector. Purpose built cables are available commercially to provide connections for digital interfaces or analog interfaces. The *DualView XL* is provided with a DVI-15 pin adapter for use with analog devices, or alternatively an analog only output cable can be purchased that provides a "break out" capability to separate RGB connectors or sub miniature 15 pin D connector.

**ETHERNET
CONNECTOR**

CONNECTOR TYPE AND PINOUTS

The Ethernet connector is a standard RJ-45 type connector.
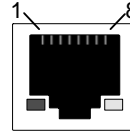
Figure B-5.   Ethernet connector (viewed from rear of chassis)

The 8 pin RJ-45 Ethernet connector has the following signals:.

Table B-4.   Ethernet Connector Pinouts

Pin	Signal	Wire Color
1	TX Data +	White/Orange
2	TX Data -	Orange
3	RX Data+	White/Green
4		Blue
5		White/Blue
6	RX Data-	Green
7		White/Brown
8		Brown

STANDARD CABLES

Standard Ethernet cables are available commercially in many different lengths.
The standard cable is wired pin for pin (straight through) which means that pin
1 of the connector at one end of the cable is wired to pin 1 of the connector at
the opposite end of the cable. This type of cable is used to connect the
DualView XL directly to the network — typically using an Ethernet hub or
switch. To connect directly from a PC to the *DualView XL*, a cross over cable
must be used (see the following section for details).

CROSS OVER CABLES

To connect directly from a PC (such as a laptop) to the *DualView XL* without
connecting to the network, an Ethernet "cross over" cable must be used. Cross
over cables are available commercially.

In a cross over cable, one end of the cable is wired as a straight through cable,
using the pin assignments shown in **Table B-4**. At the other end of the cable,
the TX and RX interconnections are exchanged (crossed over).

Ethernet uses balanced differential signals on twisted pairs of conductors. It is important to use wires from the same pair for each pair of signals. The standard pairs are shown in **Table B-4**. Note that one wire of the pair has a solid color. The other wire (of the pair) is white with a stripe of the same color as the other wire (e.g., Orange and White/Orange).

RS-232 CONNECTOR
▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪

The RS-232 port is configured according to the Electronic Industries Association Standard RS-232-C published in August 1969. The *DualView XL* can be explicitly controlled with ASCII Command Set instructions sent via the RS-232 serial port from either a computer or an ASCII terminal. In Chapter 5, refer to the "**Command Set List**" section for details on all commands.

CONNECTOR TYPE AND PINOUTS

Physically, the RS-232 port is a 9-pin D-Sub female connector. The pins for the RS-232 connector are numbered from top to bottom, right to left. Looking at the connector, pin #1 is located in the upper right corner, and pin #9 is in the lower left corner.
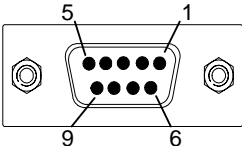
Figure B-6. 9-pin D-Sub RS-232 Female Connector

The 9-pin D-Sub connector has the following signals:

Table B-5. RS-232 Serial Connector Pinouts

Pin	Circuit	Description
1	CD	Carrier Detect
2	TD	Transmit Data
3	RD	Received Data
4		(not connected)
5	AB	Signal Ground (common return)
6	DSR	Data Set Ready
7	CTS	Clear to Send
8	RTS	Request to Send
9		(not connected)

NULL MODEM

You may need to connect the *DualView XL*'s serial port to a computer configured as Data Communications Equipment (DCE). This is done using a null modem. The net effect of a null modem is to reverse the Transmitted Data and Received Data connections within the cable. Also, the Request to Send (RTS) and Clear to Send (CTS) connections are reversed. This may be done by using a special "null modem" cable, or by inserting a small "null modem" box or cable in series with a regular "straight through" cable.

TECHNICAL SPECIFICATIONS

This chapter is divided into two sections:

- **General Specifications**, provides technical specifications for the *DualView XL* including functional and performance specifications.

- **Parameter Storage**, provides details of the types of data that are used in *DualView XL* and how they may be stored and retrieved.

Note The specifications listed in this appendix apply to a fully configured *DualView XL* system.

GENERAL SPECIFICATIONS

The following section provides detailed tables of functional and performance specifications:

- **System Characteristics**

- **Digital Input Specifications**

- **Analog Input specifications**

- **Composite Video Input Specifications**

- **S-Video Input Specifications**

- **Graphic Output Specifications**

- **Window Control Specifications**

- **Control Specifications**

- **Power and Physical Specifications**

SYSTEM CHARACTERISTICS

The table below lists *DualView XL* system characteristics:

Table C-1. System Characteristics

Parameter	Specification
Number of windows	Two windows with up to four user selectable types of inputs.
Window Borders and labels	Border widths and color may be set independently for each window. Label text and color may be applied for each window.
Input types	The user may select between the following types for each input channel: • RGB / YP_bP_r component (HDTV) • Composite video • S-Video • DVI (optional)
# of graphics outputs	Dual Outputs • 2 x DVI • 2 x Analog RGB
Horizontal scan rate	12 kHz to 125 kHz (non interlaced)
Frame rate (Refresh rate)	Up to 200 Hz
Resolution	640 x 350 to 1600 x 1200 pixels

DIGITAL INPUT SPECIFICATIONS

The table below lists high resolution graphics digital input specifications:

Table C-2. Optional Digital Input Specifications

Parameter	Specification
Type	DVI - Single link
Maximum bandwidth	1.65 Gbps
Connector type	DVI-I Integrated digital / analog connector, MicroCross (Molex #74320)

ANALOG INPUT SPECIFICATIONS

The table below lists high resolution graphics analog input specifications:

Table C-3.   Analog Input Specifications

Parameter	Specification
Type	Analog RGB/YP_bP_r
Analog video	RGB/YP_bP_r, interlaced or non-interlaced
Video level	Nominal 0.7V p-p (1.0V p-p)
Input impedance	75 ohms
Sample rate	Up to 162 Msamples / sec
Sync type	Available sync types • 3 wire (Sync On Green) • 4 wire (Separate Composite Sync) • 5 wire (Separate H and V Sync)
Sync level	0.3V p-p (3 wire), 5V p-p (4 and 5 wire sync)
Analog HD video	
Video level	1V p-p (sync and video)
Sync	Tri-level
Sync level	0.6V p-p
Connector type	Sub miniature D connector type HD-15

COMPOSITE VIDEO INPUT SPECIFICATIONS

The table below lists composite video input specifications:

Table C-4.   Composite Video Input Specifications

Parameter	Specification
Format	Composite, NTSC RS-170A or PAL CCIR 624
Number	Up to four composite channels (see S-Video specifications for details).
Input sampling	All inputs sampled as 3:2 pixels (CCIR 601 sampling)
Video levels	0.5 to 2.0V peak-to-peak; 1.0V peak-to-peak nominal
Sync levels	0.3 to 0.6V peak-to-peak
Connector type	BNC female

S-VIDEO INPUT SPECIFICATIONS

The table below lists S-Video input specifications:

Table C-5. S-Video Input Specifications

Parameter	Specification
Format	S-Video (NTSC RS-170A or PAL CCIR 624)
Number	Up to two S-Video channels, or the user may use the S-Video channel for two additional composite video inputs (Composite2).
Input sampling	All inputs sampled as 3:2 pixels (CCIR 601 sampling)
Video levels	0.5 to 2.0V peak-to-peak; 1.0V peak-to-peak nominal
Sync levels	0.3 to 0.6V peak-to-peak
Connector type	Four pin mini-DIN

GRAPHIC OUTPUT SPECIFICATIONS

The table below lists high resolution graphic output specifications:

Table C-6. Graphic Output Specifications

Parameter	Specification
Analog	
Analog output level	Nominal 0.7V. pk to pk (excluding sync)
Output impedance	75 ohms
Sample rate	Up to 162 Msample/sec
Sync type	Available sync types: • 3 wire (sync on green), • 4 wire (separate composite sync) • 5 wire (separate H and V sync)
Sync level	0.3V p-p (3wire), 5V p-p max (4 and 5 wire)
DVI	
Max bandwidth	DVI single link (1.65Gbps)
Connector type	DVI-I MicroCross Integrated Digital / Analog Connector

**WINDOW CONTROL
SPECIFICATIONS**

The table below lists window control specifications:

Table C-7.   Window Control Specifications

Parameter	Specification
Size	The size of each window can be scaled from thumbnail up to full screen.
Position	Windows may be positioned to an accuracy of one pixel horizontally and one line vertically. A window can be moved to any region of the display space, and if a portion is positioned off the screen, it is clipped.
Priority	Each window is assigned a priority by the user. When windows overlap, the window with the higher priority assignment appears in front of windows having a lower priority.
Zoom, Pan	Maximum Zoom range 32:1. Fully Pan within a zoomed window.
Other Functions	Video source select, freeze frame, brightness and contrast, hue and saturation.

**CONTROL
SPECIFICATIONS**

The table below lists *DualView XL* control specifications:

Table C-8.   Control Specifications

Parameter	Specification
Control Protocol	*DualView XL* Control is accomplished by use of the *DualView XL* ASCII based command set. This command set may be used with any of the control ports listed below.
Ethernet	10/100 BASE-T ethernet port. • Supports control of the full set of *DualView XL* commands over a network connection using a Telnet server/client architecture. • Internal *DualView XL* web server provides graphical user interface when used with standard web browser.
RS-232 Port	*DualView XL* commands can be sent through the RS-232 port to control the system. • The RS-232 port transfers commands using the asynchronous serial protocol at 115200, 57600, 38400, 19200 or 9600 baud. • The port is configured as DCE and can handle full duplex transfer. • Support for hardware and software handshaking is provided. • The *DualView XL* RS-232 port connector type is a 9-pin sub miniature D connector.

POWER AND PHYSICAL SPECIFICATIONS

The table below lists *DualView XL* power and physical specifications:

Table C-9.   Power and Physical Specifications

Parameter	Specification
Input Voltage	90-264 VAC
Frequency	47Hz - 400 Hz
Power Consumption	65VA
Size	19" W x 15.3" x D x 1.75"H
Weight	14 pounds (6.4 kg)

PARAMETER STORAGE

This section describes the categories of settings that are stored in *DualView XL* and how these settings, stored and retrieved.

FACTORY DEFAULTS

DualView XL is shipped from the factory loaded with a set of pre-configured settings (parameters) known as Factory Defaults. As soon as you begin to use the unit these default settings will be replaced with your new settings. Your new settings are automatically stored by *DualView XL* in non-volatile memory so that when you next turn on the unit it will start operating with the same settings you had when you last used the unit (even if you had turned off the power).

If you want to return to the factory settings this can be accomplished by executing the **RestoreFactoryDefaults** command   (**Chapter 5**) , or from the WCP **Restore Factory Defaults** button of the Systems page.

Note	Restoring Factory Defaults will not affect the IP address settings of your *DualView XL*.

SYSTEM CONFIGURATION

When you turn on the power to your *DualView XL*, the unit automatically loads settings for all controls from non-volatile memory so that the device will function in the same way as before the power was turned off. This information is known as the System Configuration and is stored automatically in non-volatile memory by *DualView XL*.

USER CONFIGURATION

DualView XL provides the ability for you to save your own set of default settings. This allows you to override the current settings and set up the unit in a way that you have previously defined. The **SAVECONFIGguration** command (**Chapter 5**), provides a manual way to save the current system settings into non volatile memory. The settings may then be loaded at any time using the **RECALLCONFIGuration** command. This is equivalent to using the **RestoreFactoryDefaults** command, but using your own set of default values instead of the factory defined defaults.

SETTINGS EXPORT/IMPORT

In addition to storing settings internally in non-volatile memory *DualView XL* provides the ability to store settings to an external device such as a PC. The settings are stored in a text file that can be exported to, or imported from, the external device using the **SETTINGSEXPORT** and **SETTINGSIMPORT** commands. This file can be generated to contain all the system settings, or a

subset of the settings as outlined below:

Tip	Recalling previously stored parameters will change the operation of your unit. Because there is no undo feature we recommend that you have a backup copy of your preferred settings. The copy could be stored internal to the *DualView XL* using the **SAVECONFIGguration** feature, or externally using the **SETTINGSEXPORT** feature.

SYSTEM

SetttingsExport using the SYSTEM option will result in a text file that stores the system parameters as listed in the **System state values** section later in this chapter

TIMING

SetttingsExport using the TIMING option will result in a text file that stores the values for the output and all inputs as listed in the **Timing presets** section later in this chapter.

WINDOW

SetttingsExport using the WINDOW option will result in a text file that stores the values for the Window preset settings as listed in the **Window presets** section later in this chapter.

These subsets can be created using optional arguments to the command. If the **SETTINGSEXPORT** is not provided with an argument then the default state ALL will cause the generated file to contain the complete set of parameters consisting of the SYSTEM, TIMING and WINDOW settings.

SYSTEM STATE VALUES

There are several categories of system values (parameters) that are saved and these are outlined in the following section:

INPUT TIMING VALUES

Timing values for each graphics input

- Timing preset number
- Timing preset name
- Horizontal front porch, sync width, back porch, and active area (in pixels)
- Vertical front porch, sync height, back porch, and active area (in lines)
- Sync format
- Horizontal and vertical sync polarities

- Interlace

- Autosync mode

IMAGE CONTROLS (GRAPHICS)

The following parameters are stored for each graphics input

- Input signal source

- ADC sample phase

- De-interlacer mode

- ADC gain and offset values for Red, Green, and Blue channels

- Brightness, Contrast, Hue, Saturation and Sharpness for each of 3 possible input sources (RGB, DVI, YUV)

IMAGE CONTROLS (VIDEO)

The following parameters are stored for each video input.

- Input signal source

- Brightness, Contrast, Hue, Saturation, Filter settings, Aspect Ratio, and Over/Underscan mode for each of 3 possible input sources (Composite1, Composite2, S-Video)

OUTPUT CHANNEL

The following parameters are stored for the *DualView XL* output

- Gamma

- Output sync source

- Background pattern type

- Background Red, Green, and Blue color values

OUTPUT TIMING VALUES

- Timing preset number

- Timing preset name

- Horizontal front porch, sync width, back porch, and active area (in pixels)

- Vertical front porch, sync height, back porch, and active area (in lines)

- Horizontal and vertical frequencies

- Sync format

- Horizontal and vertical sync polarities

- Scanning system (interlace/progressive)

- Output reference mode

- Aspect ratio

WINDOW SETTINGS

The following parameters are stored for each window

- Enable

- Source rectangle dimensions (X, Y, width, height)

- Destination rectangle dimensions (X, Y, width, height)

- Label Enable, position, justification, label text, color, background color

- Priority

- Border width, color

WINDOW MAPPING

The mapping of inputs to the window is stored for each window.

CONFIGURATION VALUES

- X and Y repeat rates used in interactive window position and pan

- Scale step used in interactive window size and zoom

SERIAL PORT SETTINGS FOR RS-232 CONTROL PORT

- Baud rate

- Echo

- Handshaking

WINDOW PRESETS

DualView XL is capable of storing up to 10 window presets containing the following parameters:

- Input source selection for each input

- Background pattern selection

- Background color

- Window enables for each window

- Source rectangle dimensions for each window

- Destination rectangle dimensions for each window

- Window label enable, position, justification, label text, color, and background color for each window

- Window priority for each window

- Window border width and color for each window

- Window preset name for each window

TIMING PRESETS

In addition to the factory supplied timing presets, the user is allowed to save and recall up to 61 timing presets. Note that the *DualView XL* has a common timing list that can be applied to either input or output ports.

There are three ways to create a timing preset entry. The first two of these are listed immediately below. Note that they store a limited number of timing parameters as listed in the timing preset list.

- Output Timing

  Timing presets may be created by saving output timing settings using the **OutPutTiMingSAVE** command

- Direct loading

  Timing presets may be created by directly loading them using the **TiMingLISTLOAD** command.

Timing presets contain the following parameters:

- Timing preset name

- Horizontal front porch, sync width, back porch, and active area (in pixels)

- Vertical front porch, sync height, back porch, and active area (in lines)

- Horizontal and vertical frequencies

- Sync format

- Horizontal and vertical sync polarities

- Interlace

Timing presets created by saving input timing using the '**INputSAVE**' command will contain all of the above settings in addition to the following supplemental parameters:

- ADC sample phase

- De-interlacer mode

- ADC gain and offset values for Red, Green, and Blue channels

- Brightness, Contrast, Hue, Saturation, Filter settings, Aspect Ratio and Over/Underscan mode

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