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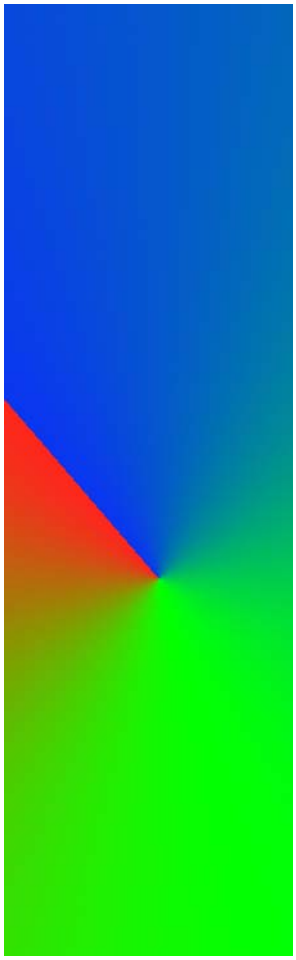
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DGy™ 201x
Graphics Resolution Digital Recording and Streaming System User's Guide



May 2008

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DOCUMENT

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1 INTRODUCTION

IN THIS CHAPTER

This chapter provides an introduction to the features of the *DGy™ 201x* Graphics Resolution Digital Recording and Streaming System. The following subjects are discussed:

- **Product Overview**
- **System Features**
- **DGy Models**
- **DGy A/V Inputs and Outputs**
- **Record and Replay**
- **Networking and Control**
- **Multi-Channel Systems**
- **Multicast Streaming (DGy-to-DGy)**
- **Interframe Compression**
- **External Timecode Synchronization**

PRODUCT OVERVIEW

The RGB Spectrum *DGy 201x* is designed to record, replay, and stream high-resolution graphic images in real time. The *DGy 201x* codec employs the advanced wavelet-based JPEG 2000 compression standard. This state-of-the-art method of coding and compression offers numerous advantages, including high coding efficiency, error-resiliency, efficient scalability, and excellent image quality.

The *DGy 201x* supports single-channel recording and playback of a wide variety of standard and non-standard graphics signals. Multi-channel recording can be accomplished by linking multiple *DGy 201x* recorders controlled from a single point.

SYSTEM FEATURES

The *DGy 201x* includes the following features and functions:

- **Quality, Utility** — The *DGy 201x* is a graphics recording, streaming, playback and storage device, offering exceptional quality, flexibility, and ease of use — all delivered in a compact 1RU package.

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- **System Input/Output** — *DGy 201x* supports RGB and DVI inputs and RGB and DVI outputs, plus stereo audio I/O. Refer to the **DGy A/V Inputs and Outputs** section for details.
- **Record Storage** — *DGy 201x* recording system includes internal disk-based storage. Refer to the **Record and Replay** section for full details. A removable disk drive is standard; an optional fixed drive is available. The ability to mount an external remote disk, network attached storage device, is also an option.
- **File Transmission** — The *DGy*'s standard networking capability enables users to transfer recorded clips to remote computers over 100/1000 Base-T connections. Refer to the **Networking and Control** section for additional details.
- **Resolution Flexibility** — *DGy* models support a wide range of resolutions and frame rates.

Table 1-1 *DGy 201x* Resolution and Frame Rates

Resolution	Maximum Frame Rate in Frames per Second
1024 x 768	47
1280 x 1024	30
1600 x 1200	20

- **Compression and Storage** — *DGy 201x* offers selectable compression rates enabling users to balance quality and recording capacity as required for each application. Quality settings and the resulting compression are shown in below.

Table 1-2 Quality Settings

Quality Setting	Compression Ratio	Relative Bits per Pixel
High	16:1	1.5
Medium	24:1	1.0
Low	34:1	0.7

For examples of recording times based on quality settings see **Table A-6, DGy 201x Record Time - 238 GB Disk** on page 123.

- **Multicast Streaming** —The *DGy 201x* supports streaming the *DGy* output to any number of other *DGy 201x* decoder clients using the Multicast Streaming feature. Refer to **Multicast Streaming (DGy-to-DGy)** on page 8 for details.

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- **Timecode** — *DGy 201x* includes flexible timecode capability for synchronization and the time-stamping of clips. Refer to the **External Timecode Synchronization** section for details.

DGy MODELS

The *DGy* graphics recorder models and their features are shown in the table below:

Table 1-3 DGy Models

Feature	*DGy 201x*	*DGy 301x*	*DGy 201x*	*DGy* 501x
Removable drive	✓	—	✓	—
Fixed internal drive	Option	—	Option	—
Remote disk mount	Option	✓	Option	✓
Maximum input resolution	1600 x 1200	1600 x 1200	1600 x 1200	1600 x 1200
FTP file transfers	✓	✓	✓	✓
Recording channels	1	1	Single-channel or dual-channel mux	Single-channel or dual-channel mux
Output channels	1 DVI/RGB	1 DVI/RGB	1 DVI/RGB 1 DVI	1 DVI/RGB 1 DVI
Audio	Single-channel stereo	Single-channel stereo	Single-channel stereo or dual-channel mono	Single-channel stereo or dual-channel mono
Multicast streaming	✓	✓	✓	✓
Simultaneous record/play	Option	Option	Option	Option
Multi-unit synchronization	✓	✓	✓	✓
IRIG-B time code	Option	Option	Option	Option
Gigabit Ethernet	✓	✓	✓	✓
Basic PC software player	✓	✓	✓	✓
Interframe compression	✓	✓	✓	✓

The DGy 301x/401x/501x are described in separate manuals.

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DGy A/V INPUTS AND OUTPUTS

The *DGy 201x* includes a comprehensive array of inputs and outputs enabling the recording, playing, and streaming of low data-rate signals — all the way to high resolution graphic displays.

SYSTEM INPUTS

The following system inputs are provided:

- **Digital** — One digital input is provided (DVI-I integrated digital/analog connector). With a pixel rate up to 165 MHz, this input supports a resolution of up to 1600 x 1200 at 60 Hz, or higher refresh rates at lower resolutions.
- **RGB** — One analog RGB input is provided (DVI-I integrated digital/analog connector). With a pixel rate up to 330 MHz, this input supports a resolution of up to 1600 x 1200 at 60 Hz, or higher refresh rates at lower resolutions.
- **Stereo Audio** — One analog stereo input is provided (2 x RCA phono connectors). Sampling rate may be set to 44.1 kHz, 22.05 kHz or 11.025 kHz.
- **IRIG Timecode** (optional) - A looping input compatible with IRIG-B DCLS and 1KHz modulated formats (IRIG B123) can be used to synchronize the system time clock to an external IRIG time standard. The loop output is used to pass the IRIG-B input signal to another IRIG-compatible device.

SYSTEM OUTPUTS

The following system outputs are provided:

- **Digital/RGB** — A DVI-I integrated digital/analog connector supports a resolution of 1600 x 1200 at 60Hz.
- **Loop** — Both the analog and digital graphics inputs have an active loop. The input signal is output on the loop connector, when the *DGy 201x* is powered on.
- **Stereo Audio** — One analog stereo output is provided (2 x RCA phono connectors).

In Appendix A, refer to the **DVI-I Connector** section for complete wiring details on the DVI-I connector.

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RECORD AND REPLAY

The *DGy 201x* offers a high degree of flexibility and versatility for recording, replaying, transmitting, and streaming clips. Replay may be accomplished directly from a *DGy 201x* or through a software player on a Windows® PC. Many of these capabilities are listed below. Please contact RGB Spectrum for details on specific configurations and capabilities. Record and playback modes include:

- Single-channel record and playback.
- Single-channel simultaneous record and playback option.

RECORD CAPABILITIES

LOCAL RECORDING

Typically, the *DGy 201x* records an input source directly to an internal removable or optional fixed disk drive. When an optional fixed drive is included, the user selects on which of the two drives the encoded material will be stored.

REMOTE RECORDING & REPLAY OPTION

A *DGy 201x* option enables recording to a remote disk drive over a network. Remote drives include network attached storage devices, servers, RAID servers, and networked PCs. To accomplish this, the remote drive is mounted as a network assigned NFS (Network File System) drive and appears to the *DGy 201x* as a local disk drive. This feature requires the use of Allegro (Windows PC platforms) or Linux based NFS servers. For more information please see **Mounting a Remote Disk Option** on page 61.

PLAYBACK CAPABILITIES

A *DGy 201x* recording can be replayed directly from an internal drive or from a remotely mounted disk (option). The file created by *DGy 201x* can also be viewed from a suitably configured PC at a reduced frame rate. The *DGy 201x*'s playback capabilities are described in the following section. For details about playback from a PC, refer to the following section **PC Software Replay Application**.

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LOCAL PLAYBACK

For local playback, the *DGy 201x* is typically configured to replay from the installed internal drive(s) to the analog RGB or DVI outputs, as shown in the figure below.

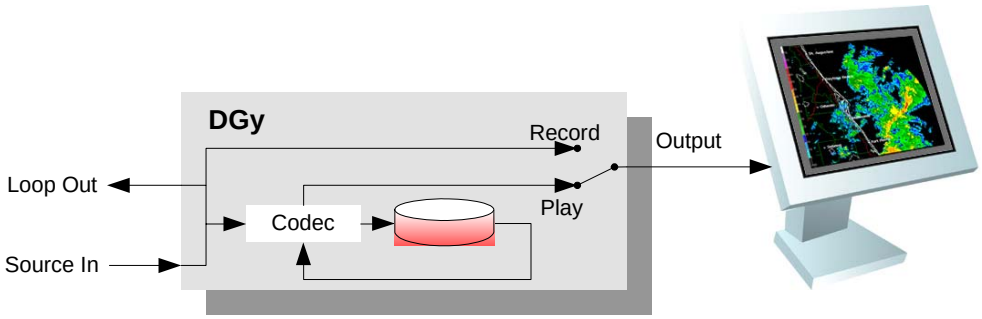


Figure 1-1 Replay from Disk, Local Viewing

PC SOFTWARE REPLAY APPLICATION

A Windows software application supplied by RGB Spectrum can be used to replay *DGy 201x* recordings directly on a PC. The quality level will be the same, but at reduced frame rates. This application works with the standard Windows Media Player (version 9 and above) to provide basic transport functions including play, pause and stop.

This application can be used to replay recordings in the following ways:

- Recordings copied from a *DGy 201x* to the PC local drive using TCP/IP file transfer protocol (FTP).
- Recordings played from a *DGy 201x* removable drive inserted in an appropriately configured PC equipped with a compatible removable disk drive bay. The *DGy 201x* uses the ext2 file system found with the Linux operating system. PCs running the Windows operating system will require additional software in order to mount the drive. This software is commercially available.

Playback quality is high, but note that the playback frame rate is limited by the performance of the selected PC. As an example, a PC equipped with a Pentium® 4, 3GHz processor with 512 MB of memory will typically play a 1280 x 1024 recording at 5 to 6 frames per second.

SIMULTANEOUS RECORD/REPLAY OPTION

The *DGy 201x* supports the optional playback from disk while concurrently recording new material. Record and play start and stop times are independent.

Additional codec circuitry is factory installed to use the Simultaneous Record/Play option on the *DGy 201x*. The presence of this option can be confirmed by viewing the **Web Control Panel Configuration Window** (page 22).

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NETWORKING AND CONTROL

Although there are no front panel controls, the *DGy 201x* includes the following networking and control capabilities:

- The **RS-232** serial port for command line control 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 *DGy 201x*. In Chapter 6, refer to the **Commands** section for details.
- The **Ethernet** port (100/1000 Base-T) allows multiple *DGy 201x* systems to be connected to a local area network (LAN), or directly to a PC properly equipped with a network card. Direct connection requires the use of an Ethernet hub or Ethernet crossover cable. This method supports a Telnet session or a standard web browser to access the *DGy 201x* internal Web Control Panel.
- **Telnet** and **web server** control capability.
- **Remote storage/replay** capability. Files can be transferred using the standard FTP protocol or, with the Remote Disk Mount option, to a remote computer or RAID file server (Windows operating system using Allegro server software or Linux). Typical compression ratios will allow users to transfer 30 fps at 1280 x 1024 over a dedicated 100/1000 Base-T Ethernet link. Replay can also be accomplished on the remote computer equipped with applicable software independent of the *DGy 201x* recorder.

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MULTI-CHANNEL SYSTEMS

All DGy models support multi-channel record and playback. A number of units can be configured and controlled from a single point using the optional RGB Spectrum Multi-Channel Manager (MCM) software.

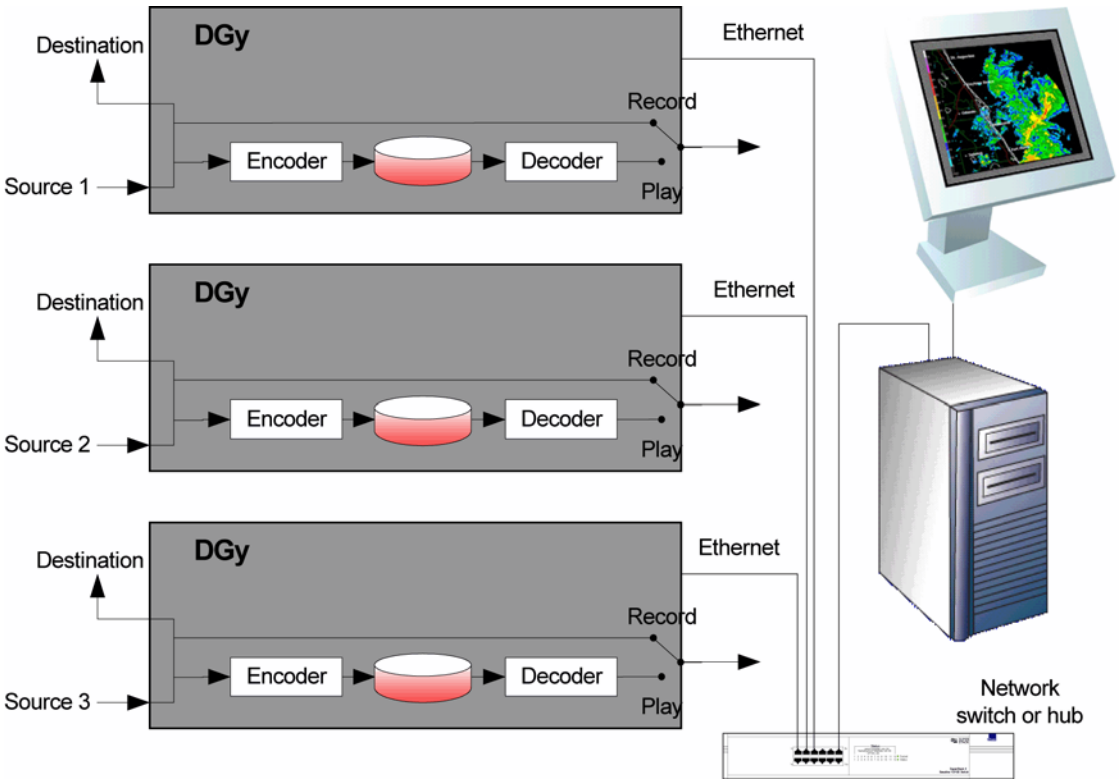


Figure 1-2 Multi-Channel Recording

The MCM runs under the Windows operating system. From a single user interface, the MCM coordinates the synchronization and control of the record and play capabilities of multiple DGy recorders.

MULTICAST STREAMING (DGy-TO-DGy)

The DGy 201x can encode and stream a graphics signal on the input port to multiple DGy decoder clients on a network using the multipoint, multicast streaming capability. The encoded bit stream is directed to the network port as a multicast transmission for remote viewing instead of directing the encoded bit stream to a network disk. Interframe compression may be used to reduce the required network bandwidth.

The multicast transmission can be received and decoded by any number of client DGy units that subscribe to the transmission.

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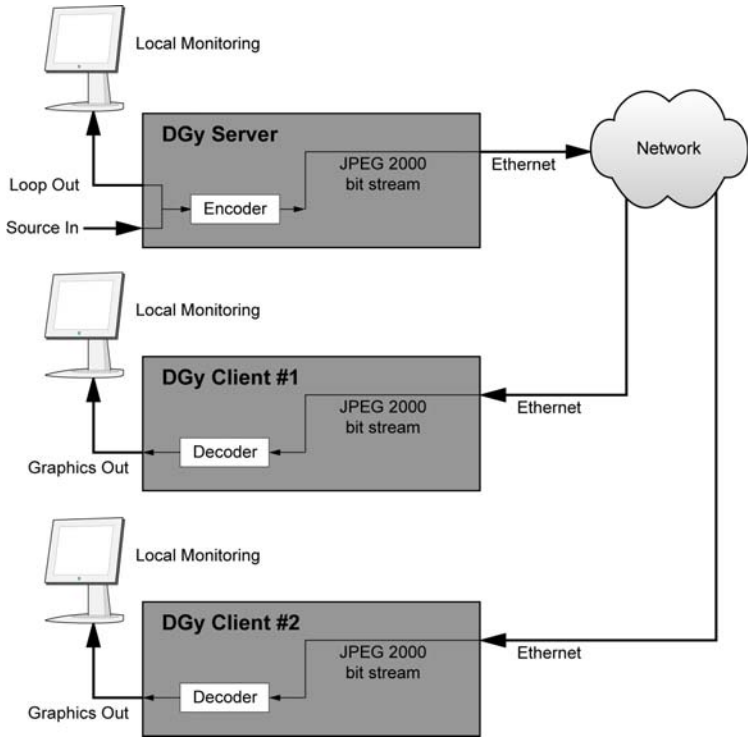


Figure 1-3 Multicast Streaming

INTERFRAME COMPRESSION

Interframe compression for live input streaming reduces the bandwidth required to transmit video data over a network. In interframe compression, each frame is compared to the previous frame. When differences between frames meet criteria defined by parameters set by the user, new frames are transmitted; if the criteria are not met, new frames are not sent and an exact repeat of the last encoded *anchor* frame is used. WCP and command line operation both support the use of interframe compression.

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EXTERNAL TIMECODE SYNCHRONIZATION

Multi-channel recording requires the synchronization of the internal real-time clocks of all the *DGy 201x* units. The *DGy 201x* can be synchronized to an external time source using a network connection to an NTP (Network Time Protocol) server. Additionally, the *DGy 201x* can be configured with an IRIG-B option. Using the IRIG loop-through connection synchronization of all *DGy 201x* real-time clocks can be done from a single IRIG-B timecode generator (IRIG DCLS or 1 kHz modulation).

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2 INSTALLATION AND SET UP

IN THIS CHAPTER

This chapter provides instructions for installing and setting up the *DGy 201x* system. The following topics are discussed:

- **Standard Supplied Components**
- **Optional Items**
- **Rack Mounting**
- **Front Panel**
- **Rear Panel**
- **Installation**
- **DGy Applications Suite**

STANDARD SUPPLIED COMPONENTS

The following items are included in the *DGy 201x* shipping carton:

Table 2-1 Standard Supplied Components

DGy 201x
Accessory Kit (domestic)
CD-ROM
Power cord (110 volt)
DVI - VGA adapter (3)
Rear rack-mount adapter kit
Accessory Kit (international)
CD-ROM
Power cord (220 volt)
DVI - VGA adapter (3)
Rear rack-mount adapter kit

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OPTIONAL ITEMS

The following options are available for the *DGy 201x*. Many of these options are factory installed and should be part of the original order.

Table 2-2 Options

Item	Part Number	Description
VGA cable	520-0298-1	15-pin HD male to 15-pin HD male, 6 ft. Use to connect analog output/inputs to sources with a female VGA connector.
Fixed disk	HDF 238	238 GB hard disk drive (factory installed).
Extra removable disk	HDR 238-X	238 GB hard disk drive with caddy and carrying case.
Extra removable disk	HDR 476-X	476 GB hard disk drive with caddy and carrying case.
VGA-to-BNC adapter	520-0251-1	15-pin HD male to a 5-BNC cable bundle male, 6 ft. 10 in. Use to connect the analog output/inputs to sources with BNC connectors.
Remote disk mount	RMD-X	Supports NFS mounting of a remote drive for access to an external storage system such as a RAID server.
Simultaneous record /play	SRP-X	Provides the ability to play a previous recording while simultaneously making a new recording. (factory installed)

RACK MOUNTING

The *DGy 201x* chassis is designed to be mounted in a standard 19-inch rack. Please note the following important points:

- Ensure that the *DGy 201x* is positioned in the rack where the side air intake and rear 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.
- Install the *lower* of the two mounting screws first.

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Important

Do not use the *DGy 201x* as a shelf to support other pieces of equipment as this may cause damage to the rack ears and mounting screws.

- The *DGy 201x* is provided with a rear rack bracket and arm to support the rear of the chassis. It is recommended that the bracket be used to provide additional stability.
- Attach the rear brackets to the rack adapter at the rear of the 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 shows the front panel of the *DGy 201x*.

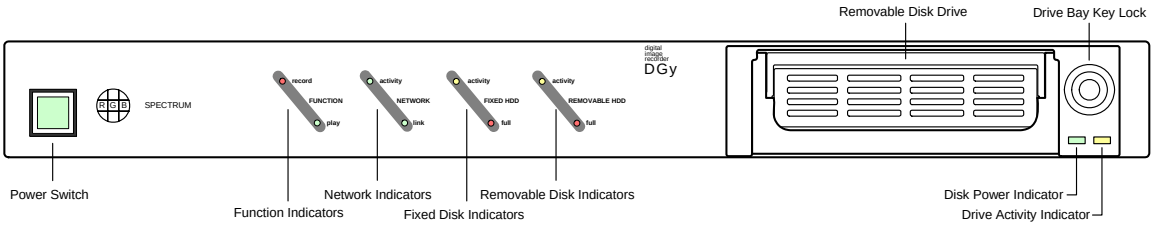


Figure 2-1 *DGy 201x* Front Panel

Descriptions of each control and indicator are provided below:

- **Power Switch**

  Use the AC Power Switch to turn the *DGy 201x* on and off. When the unit is on, the switch is illuminated.

Note

When the power is turned off from the front panel, the *DGy 201x* first closes any open files on the disk before completing power-down. This brief delay,10 to 15 seconds, is normal and the power indicator will stay lit during this interval. ***Do not turn off the DGy 201x by disconnecting the power cord or terminating the power source***, as this may result in corruption of data on the disk.

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Important

If the *DGy 201x* is not allowed to complete its shut down before loss of power, the unit will need to completely scan its disk drive at the subsequent power up. During this time, the front panel indicators will blink. The time required to scan the drive depends on the number of clips; typically, this can take from one to ten minutes.

- **Function Indicators**

  The **Record** LED lights when the *DGy 201x* is in the ***Record*** or ***Record/Pause*** mode. The **Play** LED is illuminated when the *DGy 201x* is in ***Play*** mode.

- **Network Indicators**

  The **Activity** LED is illuminated when there is activity on the *DGy 201x* network connection. The **Link** LED glows solid green when there is a valid Ethernet connection between the *DGy 201x* and another Ethernet device.

- **Fixed Drive Indicators** (Option)

  The fixed hard disk drive is a factory-installed option.

  The **Activity** LED is illuminated when there is read or write activity on the fixed hard disk drive. This indicator flashes when a disk check (fsck) operation is in progress; do not power cycle the unit during this time.

  The **Full** LED flashes when the optional, non-removable disk is near maximum capacity.

- **Removable Drive Indicators**

  The **Activity** LED is illuminated when there is read or write activity on the standard removable disk. This indicator also flashes to indicate that a disk check (fsck) operation is in progress; do not power-off or remove the disk during this time.

  The **Full** LED flashes when the removable disk is near maximum capacity.

- **Removable Disk Drive**

  Optional removable disk drives are available in two sizes: 238 GB and 476 GB.

- **Drive Bay Key Lock**

  The key lock is used to ensure that the removable drive is engaged securely in position. The key is required for both removal and installation of a removable disk drive. The key must be in the locked position before the *DGy 201x* can commence operation.

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Important Do not unlock while there is disk activity. This will cause loss of data.

- **Disk Power Indicator**

  The **Disk Power** light indicates that power is applied to the removable disk drive. The power is disabled when the key lock is in the correct position to remove or install a drive. The drive cannot be removed or installed when this light is illuminated.

- **Disk Indicator**

  The **Disk** activity light indicates read or write activity to the removable disk. Do not remove the drive while the disk is active.

REAR PANEL

The figure below shows a view of the *DGy 201x* rear panel. Click on the numbered callouts for more information on each item. Click on each connector for a description. Complete pinout information can be found in **Appendix A**.

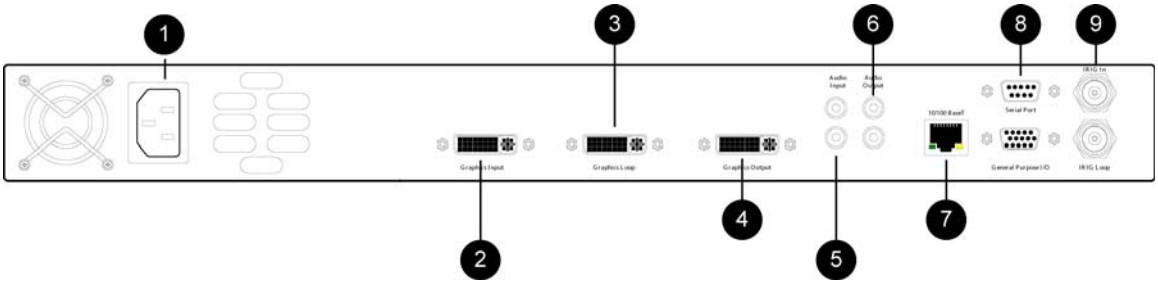


Figure 2-2 *DGy 201x* Rear Panel

1) Power Connector

One **AC Power** Connector (IEC 320 3-pin) is provided for the system's universal power supply. The DGy operates from any power source with a line voltage in the range of 100 - 240 VAC.

2) Graphics Input

The **Graphics Input** is a DVI-I connector supporting both analog RGB and digital DVI input signals. An adapter is supplied with the unit to convert to a standard VGA 15-pin sub-miniature connector.

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3) Graphics Loop

Use the **Graphics Loop** connector to pass the unprocessed input signal to an external device such as a monitor. This connector provides looping for both the digital (DVI) and analog RGB signals. This is an active loop, so there will be no output when the *DGy 201x* has no power applied.

4) Graphics Output

This **Graphics Output** connector provides both analog RGB and digital DVI output signals on a DVI-I connector. When the *DGy 201x* is in ***Play*** mode, the output signal plays back from recorded material on a disk. When *DGy 201x* is in ***Record*** mode, the output signal displays the signal present at the **Graphics Input** connector.

A DGy equipped with the simultaneous record/play option will display the playback on the **Graphics Output** connector whenever the DGy is in ***Play*** mode even when the unit is recording.

5) Audio Inputs

The *DGy 201x* provides stereo recording capability. A pair of RCA phono **Audio Input** connectors accept analog audio signals for left and right channels. The **Audio Input** will accept either line or microphone level inputs. A choice of sample rates is provided.

6) Audio Outputs

A pair of RCA phono **Audio Output** connectors supply the line level left and right analog audio output signals.

7) Ethernet Port

A standard RJ-45 connector is provided for the **Ethernet** 100/1000 Base-T control port. This port is used to control the *DGy 201x* with the RGB Spectrum graphical interface (Web Control Panel), Telnet command line interface, or for the transfer of recorded clips over a network (using FTP).

8) RS-232 Port

A standard 9-pin sub-miniature D connector provides serial connection to an external **RS-232** equipped control device. The serial port does not support a graphical user interface.

9) IRIG Ports (option)

The optional IRIG timecode input accepts IRIG-B timecode in either DCLS or 1kHz modulated formats (B123 format). The looping output can be used to provide a reference signal to other IRIG-B compatible devices.

Note

The GPIO connector is non-operational at this time.

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INSTALLATION

This section provides *DGy 201x* installation instructions. All connections are made to the rear of the chassis. Refer to **Figure 2-2** for the name and location of each connector.

Note

If the *DGy 201x* is going to be used in rack, rack installation should be done before continuing. Refer to the **Rack Mounting** section on page 12 for instructions.

Use the following steps to install the *DGy 201x*:

1. **Connect Power** — Connect the supplied power cord to the **AC Power** connector. The *DGy 201x* is equipped with a universal, 100-240 V, 50-60 Hz power supply.
2. **Connect Input** — Connect the graphics sources. Please note:
   - For an analog RGB input, use a standard VGA cable with a 15-pin male D-sub connector. Use the DVI-I to analog VGA adapter provided with the *DGy 201x*. The input connector supports 3, 4 or 5-wire connections. In Appendix A, refer to the **DVI-I Connector** section for pinout information.
   - For a digital input, use a standard DVI cable. In Appendix A, refer to the **DVI-I Connector** section for pinout information.
3. **Audio Connections** — Connect the audio source and output cables.
4. **Connect Graphics Output** — Using a DVI-I interconnect cable, connect the **Graphics Output** to the desired display devices.

   To connect to a monitor with an analog RGB input, use the adapter to convert from the DVI connector directly to a 15-pin D sub connector. Alternatively, standard cables are available to convert from the DVI connector to either 15-pin D connectors or BNC connectors.

   In Appendix A, refer to the **DVI-I Connector** section for detailed wiring instructions for the **Graphic Output** connector.

Note

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

5. **Connect IRIG In/Out connectors** - If the IRIG timecode option is installed, connect the output of the IRIG timecode generator to the *DGy 201x* IRIG input connector. Connect a cable from the *DGy 201x* IRIG loop connector to the next IRIG device in the loop to cascade to other devices.

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6. **Select a Control Method** — Control of the DGy can be through either RS-232 serial or Ethernet connection. See **Appendix B** for details on establishing communication between a PC and the *DGy 201x*.

   ~ **Serial Control** — To control *DGy 201x* using a terminal emulation program (such as Hyperterminal or Procomm), connect the COM port of the device to the *DGy 201x* **RS-232 Port**. This enables *DGy 201x* control through ASCII commands. For information on *DGy 201x* commands refer to the **Command Line Interface** chapter (page 85).

   A straight through cable (typically 9-pin male-to-female with one-to-one wiring) is required. For information on RS-232 connection parameters refer to the **RS-232 Connector** section in Appendix A (page 129).

   Launch Hyperterminal or other terminal emulator software and set the communication parameters to:

   - 115,200 Baud
   - 8 Bits
   - 1 Stop Bit
   - No Parity
   - XON/XOFF Flow Control

   For information on setting up a Hyperterminal see Appendix B, **Launching a Hyperterminal Window** on page 131.

   ~ **Ethernet Control** — To control the *DGy 201x* over a network, connect an Ethernet cable from the LAN to the *DGy 201x*'s 100/1000 Base-T **Ethernet Port**. This method allows use of a Telnet session or a standard web browser to access *DGy 201x*'s internal **Web Control Panel**. Ethernet is also ideal for controlling multiple *DGy 201x* recorders.

Note

A PC can be connected directly to the *DGy 201x* **Ethernet Port** without being connected to a network. For this direct-connect method, use an Ethernet hub or crossover cable. In Appendix A, refer to the **Ethernet Connector** section on page 128 for pinout details.

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DGy APPLICATIONS SUITE

The **DGy Applications Suite** provides a graphic alternative to command-line control. This method uses the *DGy 201x* recorder's internal web GUI application, allowing set-up and operation from a standard browser.

To use the Applications Suite:

- The Microsoft Internet Explorer web browser is recommended.
- Changes to the *DGy 201x* default IP address should be made before putting the *DGy 201x* on the network.
- Disable any pop-up blockers before launching the DGy Applications Suite.
- Ensure a copy of Java™ Runtime Environment software, version 1.4.2, 1.5.0 or higher, is installed on the PC. (The software version may be referred to 4.2 and 5.0.) A copy of Java software is included on the CD ROM provided with the *DGy 201x* or it can be downloaded free of charge from the official Sun Microsystems web site at **http://www.java.com/en/download/manual.jsp**
- The *DGy 201x* on a LAN (Local Area Network) must have a static IP address compatible with the LAN.

CONNECTING TO THE DGY APPLICATIONS SUITE

The *DGy 201x* is configured use a static IP address. The default IP address is **192.168.1.200,** but can be changed as required by the network.

Connect to the *DGy 201x* Applications Suite in one of the following ways:

- **Direct connection** — connect the Ethernet port on a computer equipped with a standard web browser to the 100/1000 Base-T **Ethernet Port** of the *DGy 201x*. An Ethernet crossover cable must be used for this connection method. In Appendix A, refer to the **Crossover Cables** section (page 129) for details.

Note

Computers that are set up to communicate on the network are typically configured to have a dynamic IP address. In this configuration, the computer is provided with a suitable IP address by a network DHCP server. When connecting directly to the *DGy 201x* a server will not be available; a static IP address must be set manually on the computer. Refer to the network settings help of the computer operating system for assistance with this.

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- **LAN connection** — connect the 100/1000 Base-T **Ethernet Port** of the *DGy 201x* to a local area network (LAN). A standard Ethernet cable is used for this connection method.

Note

The *DGy 201x* is configured at the factory with the default IP address **192.168.1.200**. Before connecting the *DGy 201x* to a network, verify that this is a valid IP address on the network. Contact the network manager for assistance. The IP address can be changed using the **IPADDRess** command from either the serial port or from a Telnet session (for more details please see **page 116**).

When the physical connections have been made, launch an internet web browser and connect to the *DGy 201x* by entering its IP address into the URL address line.

▲ **Example:** If the *DGy 201x* IP address is 192.168.1.200, the browser entry would be as illustrated below.



Figure 2-3 Sample IP Address Entry

If the network connection is working properly and the correct IP address has been entered, the *DGy 201x* responds by displaying the **Applications Suite** page shown in **Figure 2-4**.

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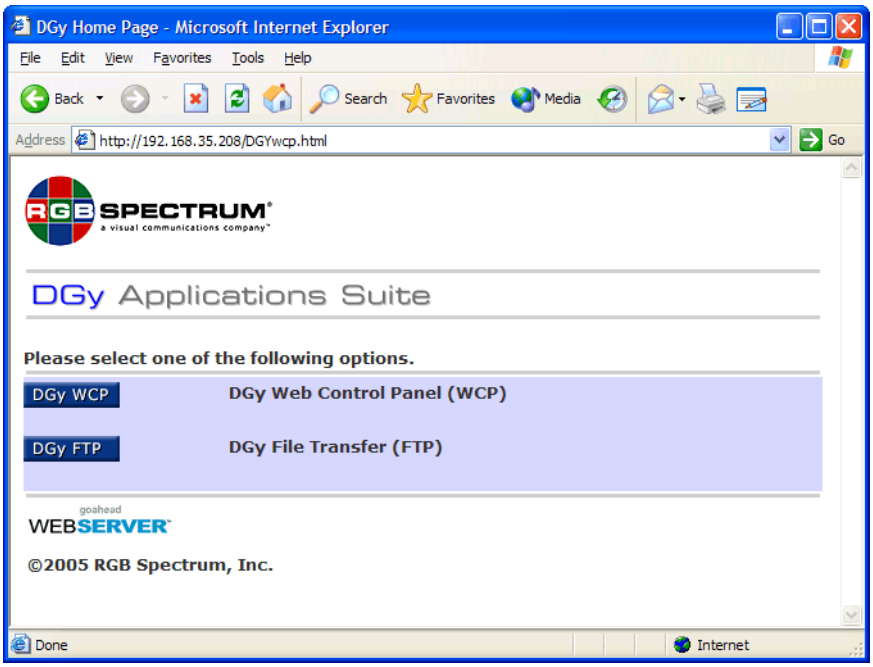


Figure 2-4 DGy Applications Suite

Use the following steps to troubleshoot a failure to connect to the Applications Suite:

- Check that the network **Link** and **Activity** LEDs on the *DGy 201x* front panel are indicating an active Ethernet link.
- Ensure that the removable hard disk drive is properly locked into place with the power on.
- Verify a working TCP/IP connection by using the “ping” utility to check the connection. The “ping” utility is typically provided as part of the networking tools included in the computer operating system.
- If using a direct Ethernet connection between the *DGy 201x* and control PC, be sure that the PC has a valid static IP address that does not conflict with the DGy, and that Ethernet crossover cable is used. Verify that the PC has been set to a static IP address compatible with the *DGy 201x* address.
- Check that the correct IP address has been entered into the browser address line. If the *DGy 201x* IP address is unknown, use the serial port to determine the current setting. In Chapter 6, refer to the **IPADDRess** command for more information.
- Check that pop-up blockers are disabled.
- Verify the PC is equipped with Java version 1.4.2, 1.5.0 or higher.

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Once the Applications Suite is displayed, click on **DGy WCP** to begin using the Web Control Panel, described in the following section, or the click **DGy FTP** for file transfer (see ***Chapter 4***).

DGy CONTROL PANEL

After selecting the *DGy 201x* WCP option from the *DGy 201x* Applications Suite page, the **WCP Configuration** window appears (**Figure 2-5**) together with the standard **DGy Control Panel** window (**Figure 2-6**).

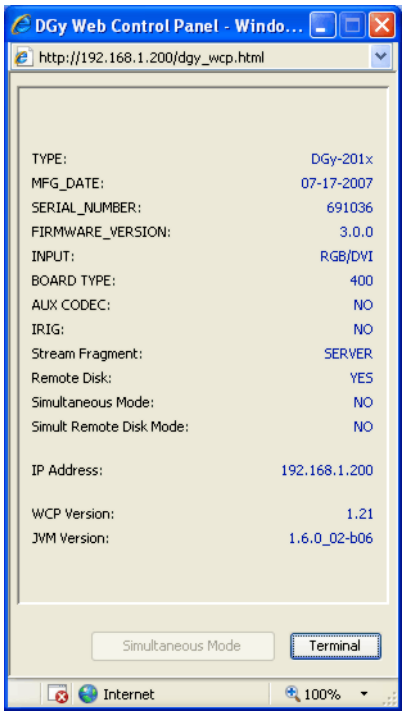


Figure 2-5 Web Control Panel Configuration Window

When the **WCP Configuration** window opens, the standard **DGy Control Panel** is automatically launched.The **WCP Configuration** window provides information about the configuration of the *DGy 201x* and two control buttons.

- **Simultaneous Mode**

  If the *DGy 201x* is equipped with the simultaneous mode option, click this button to open the Simultaneous Record/Play control panel. If the option is not installed this button will be gray and inaccessible. See **Simultaneous Record/Play Option** on page 69 for details on operation in the simultaneous mode.

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- **Terminal**

  Click the **Terminal** button to launch the terminal window. This window can be used to issue commands using the *DGy 201x* ASCII command protocol. See Chapter 6, **Command Line Interface** for information on these commands. This feature is useful to enable the command log to make or debug commands from an external controller.



Figure 2-6 Standard DGy Control Panel

The standard DGy Control Panel supports record and playback functions — including the ability to select clips, play clips, set event marks and randomly access event marks. See **Figure 3-31** on page 69 for an example of the simultaneous mode DGy Control Panel.

For complete DGy Control Panel operating instructions, refer to Chapter 3, **Operation.**

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3

OPERATION

IN THIS CHAPTER

This chapter provides user interface orientation and operating instructions for the *DGy 201x* using the DGy Control Panel. The following topics are discussed:

- **DGy Control Panel**
- **Clip Browser Window**
- **Options Window**
- **Command Line Control**
- **Recording Clips**
- **Playing Clips**
- **Clip Protection**
- **Multicast Streaming**
- **Simultaneous Record/Play Option**

BEFORE STARTING

Please note the following important prerequisites to using the DGy Control Panel:

- Ensure the system has been properly installed, with all required audio, video, and graphic connections. For details, refer to the **Installation** section in Chapter 2.
- Ensure a copy of Java™ Runtime Environment software, version 1.4.2, 1.5.0 or higher, is installed on the PC. (The software version may be referred to 4.2 and 5.0.) A copy of Java software is included on the CD ROM provided with the *DGy 201x* or it can be downloaded free of charge from the official Sun Microsystems web site at **http://www.java.com/en/download/manual.jsp**
- Ensure that a PC (or controlling device) is connected to the *DGy 201x* Web Control Panel. For details, refer to the **DGy Control Panel** section in Chapter 2.

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DGy CONTROL PANEL

The figure below illustrates a standard DGy Control Panel and Advanced Playback Console:

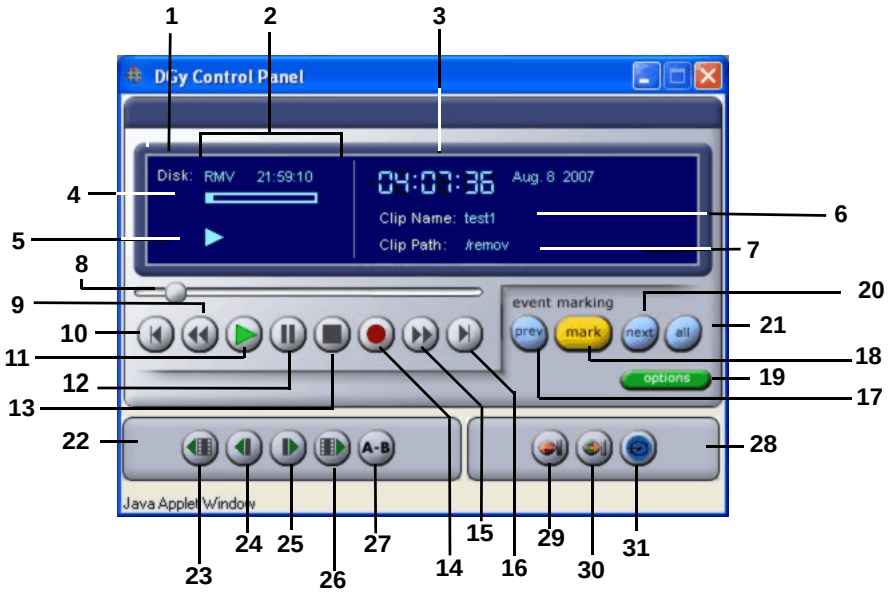


Figure 3-1 DGy Control Panel Features

1)	Disk	12)	Pause	23)	Previous Frame
2)	Disk Status	13)	Stop	24)	Slow Reverse
3)	Clip Status	14)	Record	25)	Slow Forward
4)	Disk Capacity Indicator Bar	15)	Fast Forward	26)	Next Frame
5)	Machine Status	16)	Next Clip	27)	A-B Loop Playback
6)	Clip Name	17)	Goto Previous Mark	28)	Streaming Control Panel
7)	Clip Path	18)	Set Mark	29)	Send Multicast Stream
8)	Current Position Slider	19)	Options	30)	Receive Multicast Stream
9)	Fast Reverse	20)	Goto Next Mark	31)	Stream Live Input
10)	Previous Clip	21)	Show All Marks		
11)	Play	22)	Advanced Playback Console		

1) Disk

Indicates the currently mounted disk.

2) Disk Status

This region indicates the amount of disk space remaining in **H:M:S** (hour:minutes:seconds) format.

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3) Clip Status

This display provides timecode status for the selected clip. Click the display to toggle between different counters:

- In ***Stop*** mode, the counter always indicates the date and time at the start of the recording for the selected clip.
- In ***Play*** mode, the counter displays the traversing Timecode of the original recording.
- Click on the time field to switch the display to Elapsed Time.
- Click again on the time field to switch the display to Time Remaining.
- Click on the time field to return the display to Timecode.

4) Disk Capacity Indicator Bar

This bar visually indicates the available space on the selected disk drive. The solid blue area represents the amount of disk used, as a percentage of the whole.

5) Machine Status

Icons appear in this area to indicate the ***Record/Play*** status:

- ▶ ***Play***
- ⏸ ***Pause***
- ● ***Record***
- ⏩ ***Fast or Slow Forward*** (+ speed)
- ⏪ ***Fast or Slow Reverse*** (+ speed)
- **A -** Entry point set for play loop (pending exit point)
- **A - B** ***Play Loop*** active

6) Clip Name

This line indicates the name of the clip currently recording or playing back. Click the **Clip Name** label to display the **Clip Browser** window, which enables the selection of clips for playback or recording. Refer to the **Clip Browser Window** on page 35 for details.

7) Clip Path

This line indicates the current clip path. Click the **Clip Path** label to display the **Clip Browser** window to select clips for playing or recording and set the desired path. Refer to the **Clip Browser Window** on page 35 for details.

8) Current Position Slider

The **Current Position Slider** represents the full clip duration. During playback, the “dot” moves to indicate the relative playback point within the clip.

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To randomly access any point within a clip, click and drag the “dot” to cue to a new position within the clip; the *DGy 201x* must be in ***Play*** or ***Pause*** mode. The ***Pause*** mode is enabled and the DGy is cued to this new position.

9) Fast Reverse

The five reverse play speeds are:

- -x 2
- -x 4
- -x 8
- -x 16
- -x 32

The Fast Reverse mode is available only when the *DGy 201x* is in the **Play** mode.

To select the Fast Reverse mode:

- Select the desired clip.
- Click the **Play** button.
- Click the **Fast Reverse** button.
- To play at a faster reverse speed, click on the **Fast Reverse** button again. Each click of the button will increase the speed to the next speed increment.

To return to normal (1x) play speed directly from any speed, click on the **Play** button.

If **Pause** is used during playback while in the ***Fast Reverse*** mode, clicking on **Pause** again will continue in ***Fast Reverse*** at the previously selected speed.

If **Fast Forward** is selected while in the Fast Reverse mode, the *DGy 201x* will change direction and play at the first fast forward speed.

Pressing the **Stop** button will cause play to stop and also cancel the Fast Reverse speed setting.

10) Previous Clip

Click the **Previous Clip** button to move to the clip prior to the clip currently selected. This command is active only in the ***Play*** or ***Pause*** modes, and is inactive in the ***Stop*** mode.

Clicking the **Previous Clip** button in the ***Play*** or ***Pause*** mode causes *DGy 201x* to cue to the beginning of the previous clip in the clip list (see **Clip Browser Window**, page 35) and automatically enter the ***Pause*** mode. To begin playback click on the **Play** or **Pause** buttons.

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11) Play

Click **Play** to play the clip forward at 1x normal play speed. The ▶ symbol appears in the status area.

12) Pause

Click **Pause** to pause recording or playback. The ⏸ symbol appears in the status area. To resume playback click on the **Play** or **Pause** button; to resume recording click on **Record** or **Pause**.

13) Stop

- In ***Record*** mode clicking the **Stop** button halts the recording.
- In ***Play*** mode clicking the **Stop** button halts playback and re-cues to the beginning of the clip.

14) Record

Click **Record** to record to the current clip name and path, using parameters set on the **Record** tab in the **Options** window. The ● symbol appears in the status area. When recording begins, the *DGy 201x* records the video coming into the graphics input port.

If clip auto-naming is enabled (see **Enable Clip Auto Naming** on page 41), recording will begin immediately upon clicking the record button. If auto-naming is not enabled, a prompt for a new clip name is displayed. If the named clip has already been recorded, a prompt to confirm to overwrite the clip is displayed.

15) Fast Forward

There are a total of five fast forward speeds as shown below:

- x 2
- x 4
- x 8
- x 16
- x 32

The ***Fast Forward*** mode is available only when the *DGy 201x* is in the ***Play*** mode.

To select the ***Fast Forward*** mode use the following procedure:

- Select the desired clip. Click on the **Clip Name** label and select a clip from the **Clip Browser** window.
- Click the **Play** button.
- Click the **Fast Forward** button.
- To play at a faster forward speed, click on the **Fast Forward** button again. Each click of the button will increase the speed to the next speed increment.

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To return to normal (1x) playspeed immediately from any playspeed click on the **Play** button.

If **Pause** is clicked in the fast forward mode, clicking on **Pause** again will continue in fast forward at the previously selected speed.

If **Fast Reverse** is selected while in the ***Fast Forward*** mode, the *DGy 201x* will reverse direction and play at the lowest reverse speed.

Pressing the **Stop** button will cause play to stop and cancel the fast forward speed setting.

16) Next Clip

Click the **Next Clip** button to move to the clip subsequent to the clip currently selected. This command is active only when in the ***Play*** or ***Pause*** mode, and is inactive in the ***Stop*** mode.

- Clicking the **Next Clip** button in the ***Play*** mode causes *DGy 201x* to cue to the beginning of the next clip in the clip list (see **Clip Browser Window**) and automatically enter the ***Pause*** mode. To begin playback click on the **Play** or **Pause** buttons.
- Clicking the **Next Clip** button in the ***Pause*** mode causes *DGy 201x* to cue to the beginning of the next clip in the clip list (see **Clip Browser Window**). To begin playback click on the **Play** or **Pause** buttons.

17) Goto Previous Mark

After some Event Marks have been entered in the Event list (see **Set Mark** in the following section), the **Prev** and **Next** mark buttons can be used.

Click **Prev** to cue to the previous event mark.

Click on **Play** or **Pause** to continue playback from the new cue point. This command works in ***Play*** or ***Pause*** modes only.

18) Set Mark

A mark can be set while in the ***Record*** or ***Play*** mode. In ***Record***, click **Mark** to set a mark immediately. In ***Play***, click **Mark** at the current playback position of the clip. A mark will be entered in the **Event Marking** list. Marks are automatically provided with a unique mark number derived from the timecode on the recording. Once an Event mark is created, it can be named. See **Show All Marks** for information on how to name an event mark.

19) Options

Click **Options** to display the **Options** window, used to set a variety of system options, including audio, video, recording, and streaming parameters. Refer to the **Options Window** on page 39 for details.

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20) Goto Next Mark

With marks established, click **Next** to instantly jump to the next mark and cue clip playback. Click on **Play** or **Pause** to continue playback from the new cue point. This command works in ***Play*** or ***Pause*** modes only.

21) Show All Marks

Click **All** to display the **Event Marking** window, used to view, manage and edit marks. A sample window is shown below.

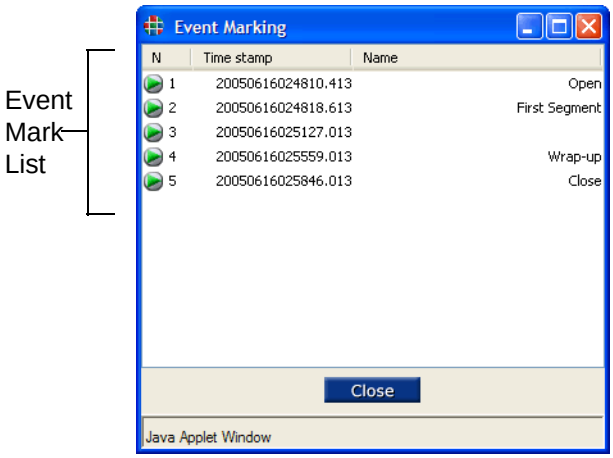


Figure 3-2 Event Marking Window

Go directly to an Event Mark by using the Event Mark List as shown in Figure 3-2 above. Double click on the desired Event Mark's time stamp and the *DGy 201x* will stop playback, cue to the selected Event Mark and enter the ***Pause*** mode. Click on the **Play** or **Pause** button to continue playback from the selected Event Mark.

To name an Event Mark, double click in the Name column of the desired Event Mark. Type a name and press **ENTER** on the keyboard.

To delete an Event Mark, highlight the desired Mark, right click the PC mouse and select **Delete** from the drop down menu.

22) Advanced Playback Console

Controls enabling slow playback and single frame step modes are provided in the Advanced Playback Console.



Figure 3-3 Advanced Playback Console

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The Advanced Playback Console (**Figure 3-3**) is located immediately below the DGy Control Panel Player Screen (**Figure 3-1**). When the DGy Control Panel is first opened, the Advanced Playback Console is activated. To turn off the Advanced Playback Console:

- On the DGy Control Panel Player Screen, click the **Options** button.
- Select the **Playback** tab on the **Options** window.
- Uncheck the **Enable Advanced Playback Console** box (**Figure 3-4**).

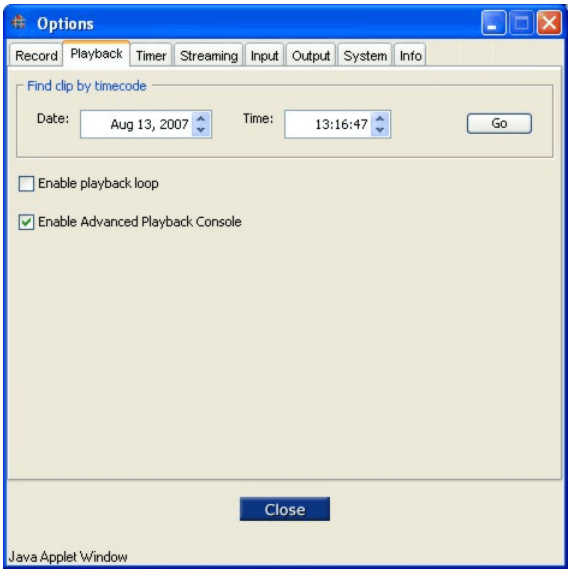


Figure 3-4 Options Playback Tab

If the Advanced Playback Console is not displayed then it has been de-activated. Two methods can be used to activate the Advanced Playback Console.

- On the DGy Control Panel Player Screen select **Play** or **Pause**.
- Click either the **Fast Forward** or the **Fast Reverse** button.

  The Advanced Playback Console will be displayed.

OR

- On the DGy Control Panel Player window, click the **Option** button (**Options**).
- Select the **Playback** tab in the **Options** window.
- Check the **Enable Advanced Playback Console** box (**Figure 3-4**).

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The functions provided by the Advanced Playback Console are described in the following sections.

23) Previous Frame

The **Next Frame** and **Previous Frame** buttons are used to step through a clip one frame at a time. This function is available in ***Pause*** mode only.

To step backwards a frame:

- Select the desired clip. Click on the **Clip Name** label and select a clip from the Clip Browser list.
- Click the **Play** button.
- Click the ***Pause*** button.
- Click the **Previous Frame** button.

Each click of the **Previous Frame** button will move the displayed image to the next frame until the end of clip is reached.

To cancel the ***Previous Frame*** mode click the **Play** or **Stop** button.

24) Slow Reverse

There are total of four slow reverse speeds:

- -x 0.8 (80% of normal speed)
- -x 0.5 (50% of normal speed)
- -x 0.3 (30% of normal speed)
- -x 0.1 (10% of normal speed)

The ***Slow Reverse*** mode is available only when the *DGy 201x* is in the ***Play*** or ***Play-Pause*** mode. To select the ***Slow Reverse*** mode use the following procedure:

- Select the clip to play. Click on the **Clip Name** label and select a clip from the Clip Browser list.
- Click the **Play** button.
- Click the **Slow Reverse** button.
- To play at a slower reverse speed, click on the **Slow Reverse** button again. Each click of the button will decrease the speed to the next speed increment.

To return to normal (1x) playspeed immediately from any play speed click on the **Play** button.

Pressing the **Stop** button will cause playback to stop and cancel the Slow Reverse setting.

25) Slow Forward

There are total of four slow forward speeds:

- x 0.8 (80% of normal speed)
- x 0.5 (50% of normal speed)
- x 0.3 (30% of normal speed)
- x 0.1 (10% of normal speed)

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The ***Slow Forward*** mode is available only when the *DGy 201x* is in the ***Play*** or ***Play-Pause*** mode.

To select the **Slow Forward**:

- Select the clip to play. Click on the **Clip Name** label and select a clip from the Clip Browser list.
- Click the **Play** button.
- Click the **Slow Forward** button.
- To play at a slower forward speed, click on the **Slow Forward** button again. Each click of the button will decrease the speed to the next speed increment.

To return to normal (1x) playspeed immediately from any playspeed click the **Play** button.

Pressing the **Stop** button will cause playback to cease and the Slow Forward setting will be canceled.

26) Next Frame

The **Next Frame** and **Previous Frame** buttons can be used to step through a clip one frame at a time. These functions are only available in the ***Pause*** mode.

To step forward a frame use the following procedure:

- Select the clip to play. Click on the **Clip Name** label and select a clip from the Clip Browser list.
- Click the **Play** button.
- Click the **Pause** button.
- Click the **Next Frame** button.

Each click of the **Next Frame** button will move the displayed image to the next frame until the end of clip is reached.

To cancel the ***Next Frame*** mode click the **Play** or **Stop** button.

27) A-B Loop Playback

The A-B button is used to set the beginning (A) and end (B) of a playback loop within a clip. To set up a play loop:

- Start playing the desired clip from a point before the point of the loop start.
- When the loop start point is reached, click the **A-B** button. The machine status indicator will display **A-** (without the B) to confirm that a play loop start point has been set.
- Continue playing the clip to the desired loop end and click the **A-B** button again. The machine status indicator will display **A-B** indicating that the end point has been set and the unit is in the ***Play Loop*** mode.

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To cancel the ***Play Loop*** mode click the **A-B** button. The looping function can be canceled at any point during the loop.

28) Streaming Control Panel



Figure 3-5 Streaming Control Panel

29) Send Multicast Stream

Click this button to begin transmitting a multicast stream of a live input signal.

30) Receive Multicast Stream

Click this button to begin receiving, decoding, and viewing a multicast stream.

31) Stream Live Input

Click this button before initiating the multicast stream to set the DGy to encode a live input signal.

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CLIP BROWSER WINDOW

The **Clip Browser** window is used to select clips for playback.

To access the **Clip Browser** window, click on **Clip Path** on the DGy Control Panel. The figure below shows a typical **Clip Browser** and indicates portions of the window.

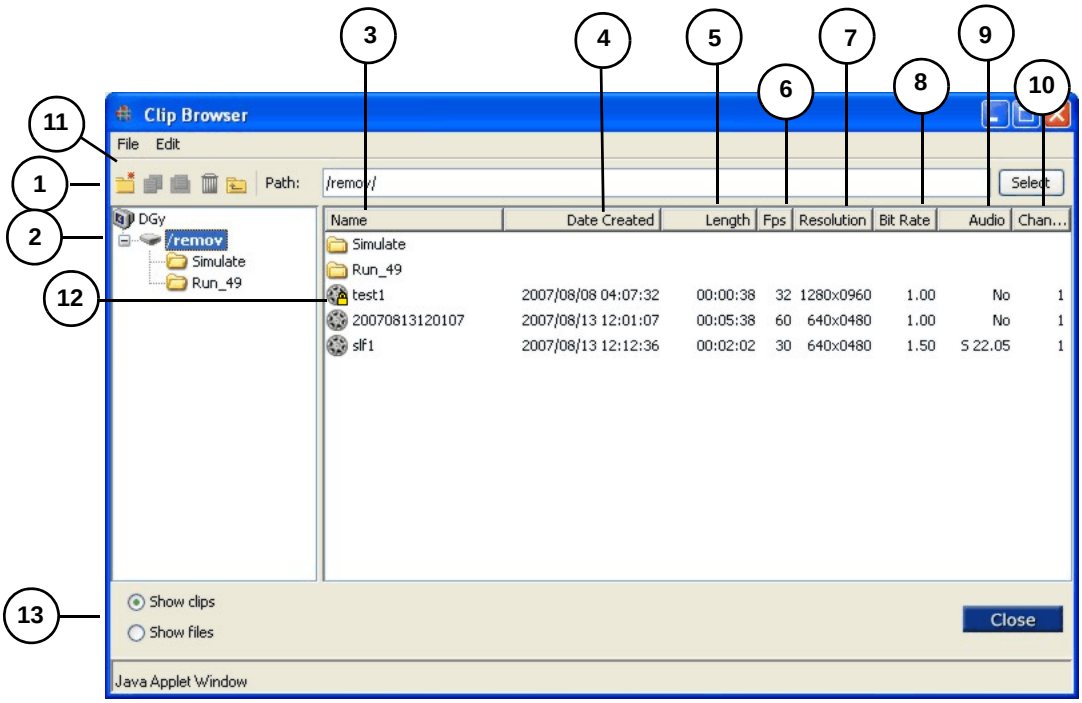


Figure 3-6 Clip Browser Window

1)	Browser Tools	6)	Frame Rate per Second	11)	Tool Bar
2)	Disk Directory	7)	Resolution	12)	Clip Protection
3)	Name Field	8)	Bit Rate (quality setting)	13)	Show clips/Show files
4)	Date Created	9)	Audio		
5)	Length	10)	Recorded Channels		

1) Browser Tools

The **Browser Tools** section includes icons for the following functions:

- Create a new folder.
- Copy clip.
- Paste clip.
- Move up one level.

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2) Disk Directory

The **Disk Directory** column displays all folders and paths in the selected disk drive, using the standard Windows tree approach.

3) Name Field

The **Name** field displays the name of each clip in the list. When in ***Stop*** mode, double click on a clip name to select the clip and initiate playback automatically.

4) Date Created

Displays the time and date at the beginning of the clip when the clip was originally recorded.

5) Length

Displays the length of the clip.

6) Frame Rate per Second

Displays the recorded frame rate in frames per second (fps).

7) Resolution

Displays the resolution (in pixels) of the recorded image (HxV).

8) Bit Rate (quality setting)

Indicates the bit rate of the clip. See **Table 1-2** on page 2 for additional information.

0.7 - low quality

1.0 (default) - medium quality

1.5 - high quality

Quality is set on the **Record** tab of the **Options** window before a recording is made.

9) Audio

Indicates the audio sample rate of the clip.

- 44.1 kHz (CD sample rate; default setting)
- 22.05 kHz
- 11.025 kHz

All recorded audio will be stereo, indicated by an **S**. If no audio is recorded, this field will display **No**.

10) Recorded Channels

The *DGy 201x* supports only single-channel record and playback.

11) Toolbar

The Clip Browser toolbar is located at the top of the **Clip Browser** window (see **Figure 3-6**). The toolbar provides access to the **File** and **Edit** menus.

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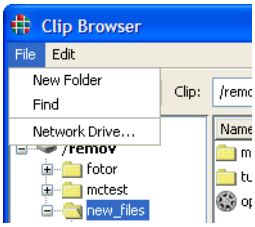


Figure 3-7 Clip Browser File Menu

The Clip Browser **File** menu provides the following functions:

- Create a **New Folder**.
- **Find** a clip.
- Mount a remote **Network Drive** (option).

  See **Mounting a Remote Disk Option** on page 61 for more information on the optional Remote Disk Mount feature.



Figure 3-8 Clip Browser Toolbar Edit Menu

The Clip Browser Toolbar **Edit** menu provides the following functions:

- **Copy** clip to clipboard.
- **Paste** contents of clipboard to a selected folder.
- **Delete** selected clip.
- **Rename** selected clip.
- **Protect** selected clip.

The Clip Browser tool icons also provide a quick way to access the **Copy**, **Paste**, **Delete** and **New folder** commands.

12) Clip Protection

See **Clip Protection** on page 65 for details.

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13) Sho**w clips/Show files**

It is generally convenient to display recordings in the **Clip Browser** as clips. Clips, however, are created as a sequence of underlying files. In some situations it is useful to be able to display clips as the list of all the files that comprise the full clip. Click the **Show files** radio button to view a list of the underlying files.

The first file of a clip is <clip name>.mj2. Subsequent files are named <clip name>nnnnnn.mj2 starting at 000000 then numbered sequentially.

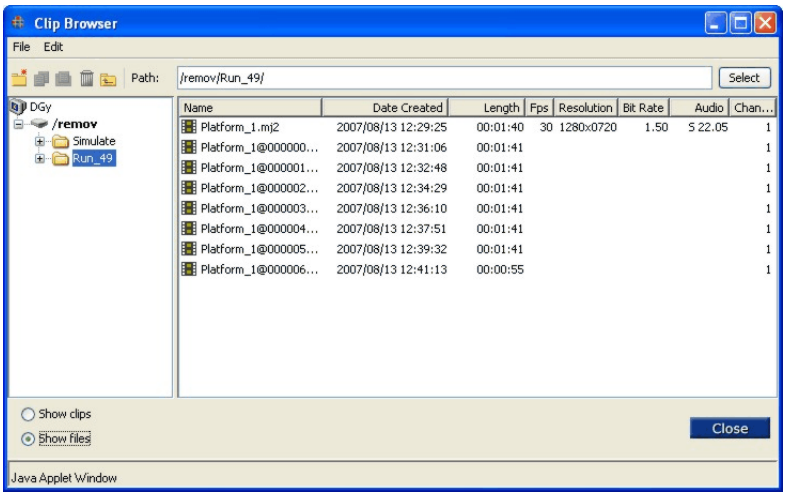


Figure 3-9 Clip Files

The maximum size of each file in a clip is 512 MB which represents a record time of about 1.7 mins/file with a resolution of 1280 x 1024 at 30 frames per second and a medium quality setting, 1.0 bit rate. The record rate depends upon the resolution of the image, the frame rate and the choice of quality level. As an example a record rate of 5MB/s is required to record a 1280 x 1024 image at a 30 Hz frame rate and mid level (24:1) quality setting.

Table 3-1 Maximum File Size in Minutes

Resolution	Quality Setting		
	High (16:1)	Medium (24:1)	Low (34:1)
1024 x 768 @ 30 Hz	1.9 mins.	2.9 mins.	4.1 mins.
1280 x 1024 @ 30 Hz	1.2 mins.	1.7 mins.	2.5 mins.
1600 x 1200 @ 20Hz	1.2 mins.	1.8 mins.	2.5 mins.

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- **Example**: A 1024 x 768 @ 30Hz image is recorded at medium level quality with a clip length of 38 minutes. From Table 3-1 above, the maximum file size at this resolution is about 1.7 minutes in length. The total number of files created to support this clip will then be 38/1.7 **=** 23.

To use the clip browser to show files contained within the clips click on the **Show files** radio button.

To show clips in the clip browser click on the **Show clips** radio button.

OPTIONS WINDOW

The **Options** window uses tabs to set a variety of system, record, playback, and setup parameters. The tabs are:

- **Playback Tab**
- **Record Tab**
- **Timer Tab**
- **Streaming Tab**
- **Input Tab**
- **Output Tab**
- **System Tab**
- **Info Tab**

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RECORD TAB

The **Record** tab, shown in the figure below, allows selection of the source to record and set the frame rate and quality of the recorded image. An audible alarm to warn the when the disk is approaching full capacity can be set.

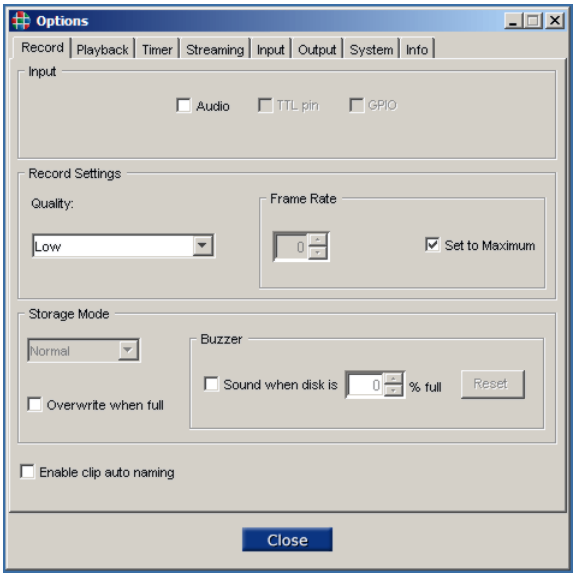


Figure 3-10 Record Tab

INPUT

With nothing checked, only video is recorded. Check **Audio** to record audio input signals together with the video.

Note

TTL Pin and **GPIO** are not currently implemented on the *DGy 201x*.

RECORD SETTINGS

- **Quality:** Use the pull-down menu to set the desired recording quality, from **High** to **Low**. When set to **High** the Record Bit Rate is set to 1.5 bits per pixel (16:1 compression). For most applications the Medium setting is recommended (default). The Medium setting provides compression of 1.0 bits per pixel (compression ratio 24:1). Low quality records at 0.7 bits per pixel (34:1 compression).
- **Frame Rate**: Check **Set to Maximum** to record at the maximum frame rate allowable for the selected input resolution. The DGy will automatically compute and set the frame rate based upon the selected input resolution and the quality setting. Alternately, uncheck the box to manually set the frame rate with the up/down selector.

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If a frame rate is selected that exceeds the maximum value for the current input resolution and quality setting, the *DGy 201x* will record at the maximum frame rate compatible with the current quality setting and input resolution.

STORAGE MODE

- **Overwrite when full**: Check this box to activate the record overwrite feature. When checked, the *DGy 201x* will overwrite old recordings when the disk is full.
- **Sound buzzer when full**: Check this box to enable an audible alert and flashing front panel lights when the selected disk reaches the threshold level set in the **% full** entry box.

  If the buzzer sounds, click **Reset** to silence the buzzer.

ENABLE CLIP AUTO NAMING

Check **Enable clip auto naming** to automatically create and name new clips when the **Record** button is clicked. Automatically naming a clip provides the advantage that the *DGy 201x* will begin recording right away without first prompting for a clip name.

When unchecked, a clip name is required and the DGy Control Panel prompts for a name entry when recording is initiated. Numbers and letters can be used in names; spaces cannot be used. The default is automatic naming. Automatic naming is numeric, based on the time and date the recording was initiated. Refer to the **Recording Clips** on page 61 for details.

Note Recorded clips can be renamed as desired.

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PLAYBACK TAB

The figure below shows the **Options** window with the **Playback** tab selected**.**

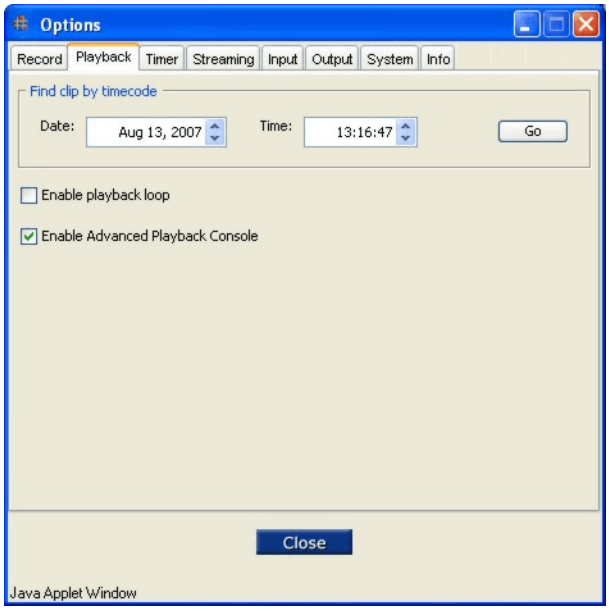


Figure 3-11 Playback Tab

FIND CLIP BY TIMECODE

When a recording is made the recording is stamped with a timecode. The **Playback** tab provides the ability to go directly to a timecode position providing random access to any point within a clip. This is equivalent to the **RealTimeSeek** command. Seeking to a timecode can be done when the *DGy 201x* is in either ***Play***, ***Pause*** or ***Stop*** mode.

Use the following procedure to go to a specific timecode:

1) From the **DGy Control Panel** (Figure 3-1) click on the **Options** button.
2) In the **Options** window select the **Playback** tab.
3) Select the date of the clip by entering directly into the Date field or using the spin controls.
4) Select the desired seek time by entering it directly into the Time field or use the spin controls.
5) Click on the **Go** button.
6) The *DGy 201x* will cue to the specified timecode if the timecode is within the scope of the current clip.
7) Click on **Play** to commence playback from the specified point.

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PLAYBACK LOOPING

The **Enable playback loop** check box enables the *DGy 201x* to repeatedly play the entire current clip.

ADVANCED PLAYBACK CONSOLE

Check the **Enable Advanced Playback Console** box to enable or uncheck to disable the display of the console in the **DGy Control Panel** window.

TIMER TAB

The **Timer** tab provides the ability to record a new clip or playback an existing clip at a user defined time like preprogramming a VCR. Either a **Record Timer** or **Play Timer** can be set.

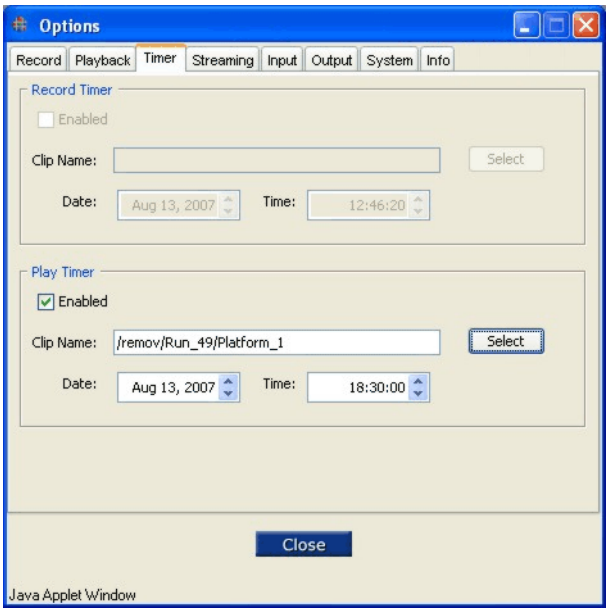


Figure 3-12 Timer Tab

RECORD TIMER

To set a ***Record Timer*** event:

~ Enter a clip name into the **Record Timer Clip Name** dialog box. A quick way to set the path name is to use the **Select** button to navigate to the desired folder, and type a file name.

Important If the name of an existing clip is entered it will be replaced by the new recording. No warning message will be displayed.

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- Enter the desired start date in the **Date** box.
- Enter the desired record start time into the **Time** box.
- Click in the **Enable** check box to activate the Timer.

To cancel a Record Timer event:

- If the Record Timer that has not yet started, uncheck the ***Record Timer*** **Enabled** box.
- If a ***Record Timer*** that has already started, click the **Stop** button on the DGy Control Panel.

PLAY TIMER

To set a ***Play Timer*** event:

- Enter a clip name into the **Player Timer Clip Name** dialog box. A quick way to set the path name is to use the **Select** button to navigate to the desired folder and select the desired clip.
- Enter the required start date into the **Date** box.
- Enter the required start time into the **Time** box.
- Click in the **Enable** box to activate the ***Play Timer***.

To cancel a Play Timer event:

- If the ***Player Timer*** that has not yet started, uncheck the ***Play Timer*** **Enable**.
- If the ***Player Timer*** that has already started, click the **Stop** button on the DGy Control Panel

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STREAMING TAB

The streaming tab is used to set parameters for multicast streaming. A multicast stream directs encoded live input to a network port on the DGy selected as the server for remote viewing through one or more DGy decoder clients.

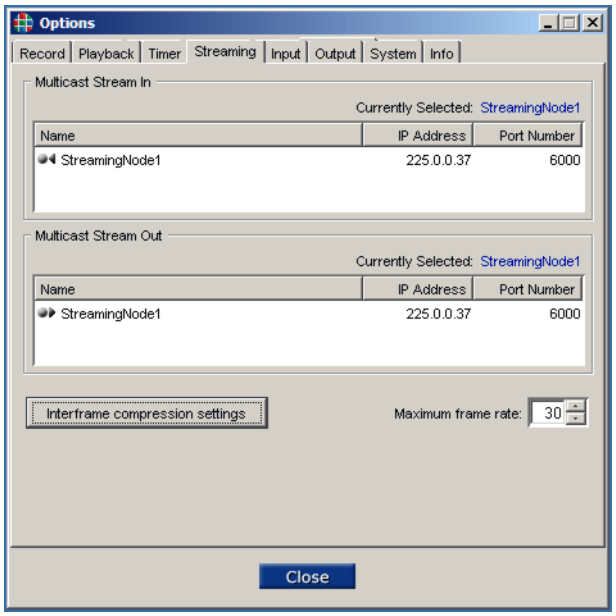


Figure 3-13 Streaming Tab

MAXIMUM FRAME RATE

Set the maximum frame rate for streaming. Set the maximum frame rate to 0; the DGy will automatically compute the maximum frame rate.

Important

If the **Frame Rate - Set to Maximum** box was checked on the Record tab, the value displayed on the **Streaming** tab will be zero also. The frame rate must be set to 0.

INTERFRAME COMPRESSION

Interframe compression for live input streaming reduces the bandwidth required to transmit video data over a network. In interframe compression, each frame is compared to the previous frame. When differences between frames meet criteria defined by parameters set by the user, new *anchor* frames are transmitted; if the criteria are not met, new frames are not sent and an exact repeat of the last encoded anchor

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frame is used; the client receiving the compressed data repeats the current anchor frame until a new one is received. This frame repeat pr0cess reduces network bandwidth as transmission of new frames is not performed.The level of contrast in an image and the degree of motion between frames are factors in setting interframe compression parameters.

When the **Interframe compression settings** button on the **Streaming** tab is clicked, the **Interframe Compression** adjustment window opens. See **Figure 3-14**.

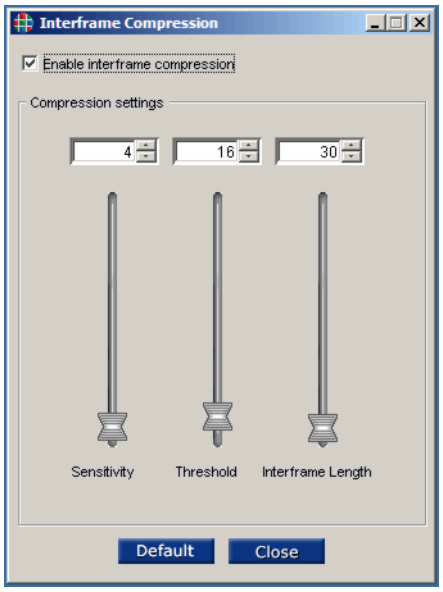


Figure 3-14 Interframe Compression Adjustment Window

Check **Enable interframe compression** to use interframe compression during multicast streaming.

Interframe compression parameter values may be entered by typing a number in the box, using the arrows to increase or decrease a value, or by using the slider. Interframe compression parameters are:

- **Sensitivity** - The *DGy 201x* evaluates changes by examining blocks of pixels. This parameter sets the number of block changes which will trigger the transmission of a new anchor frame. Sensitivity may be set to a number between 0 and 255 with a default of 4.

  ▲ **Example**: A 1600 x 1200 has about 60,000 pixel blocks. If the sensitivity is set to 20 and only 10 blocks have changed edge state since the previous frame, then the sensitivity value will not have been exceeded and a new frame is not sent. If the sensitivity is set to 20 and 400 blocks have changed, the sensitivity level has been exceeded and a new anchor frame is transmitted.

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- **Threshold** - When edge differences between blocks in successive frames exceeds the threshold value, a change is registered. The threshold value may be set to a number between 0 and 255 with a default of 16. A low threshold number requires small edge differences between blocks to be considered a change; a high threshold number allows greater differences before a change is indicated.

  ▲ **Example**: A black foreground airplane against a blue and white sky can use a high threshold of 240. This threshold allows the DGy to locate only edges associated with the airplane while ignoring edges between sky and clouds. The threshold parameter would have to be lowered, possibly to 50, if edges of a light gray airplane needed to be located against a medium gray cloud background.

- **Interframe Length** - The interframe length establishes a minimum rate for the transmission of a new anchor frame regardless of the threshold or sensitivity setting. This insures that even slow, incremental changes are captured. Interframe length may be set to a value between 0 and 4095 with a default of 30. Interframe length should be adjusted after threshold and sensitivity parameters have been set.

  To calculate the refresh rate:

  $$\frac{\text{Signal frame rate}}{\text{Interframe length}} = \text{Refresh rate in Hz}$$

▲ **Example 1**: For a frame rate of 15 fps and an interframe length of 5, the minimum frame update rate would be:

$$\frac{15}{5} = 3 \text{ Hz or 3 frames per second.}$$

▲ **Example 2**: For a frame rate of 30 fps and an interframe length of 59 the minimum update rate would be:

$$\frac{30}{60} = \frac{1}{2} \text{ Hz or once every 2 seconds.}$$

The optimal interframe compression settings for an input depend on the nature of the image; some experimentation may be required. Set interframe compression values low for an image with a high degree of motion; this will keep the motion smooth. Higher settings may be used for an image with little motion. The higher the interframe length, the greater the reduction of network bandwidth used.

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INPUT TAB

The **Input** tab is used to select the video input source, the type of audio, image settings, and load specific input signal timing parameters. **Figure 3-15** illustrates the **Input** tab.

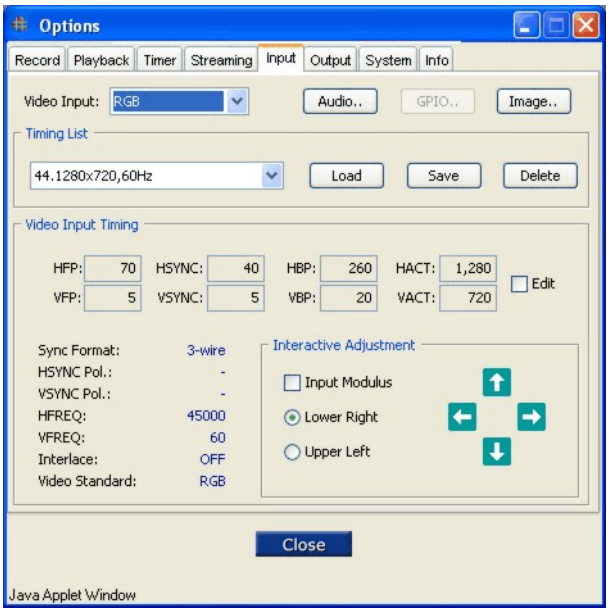


Figure 3-15 Input Tab

VIDEO INPUT

At the top of the **Input** tab, use the pull-down **Video Input** menu to select the DVI or RGB video input.

AUDIO

Click on the **Audio** button to open the **Audio Settings** dialog box shown in **Figure 3-16**. Use this dialog to set the audio inputs to accept line or microphone level input signals.

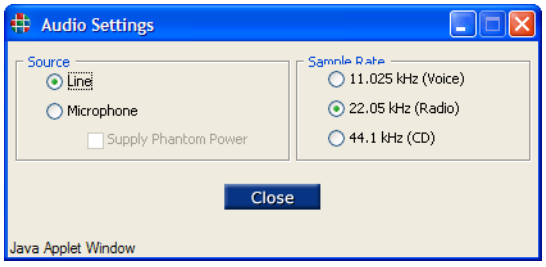


Figure 3-16 Audio Settings Dialog

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- Select the **Source** of the Audio input to **Line** or **Microphone**.
- If using a microphone input that requires power to supply the microphone, select the **Phantom Power** check box.
- Set the **Audio Sampling Rate** based upon the desired quality level. Full CD quality audio is provided using the default 44.1 kHz sample option. This is equivalent to a data rate of 176 kBytes per second.

IMAGE ADJUSTMENTS

When the **Video Input** is set to RGB, click **Image** to display the **Image Adjustment** window.

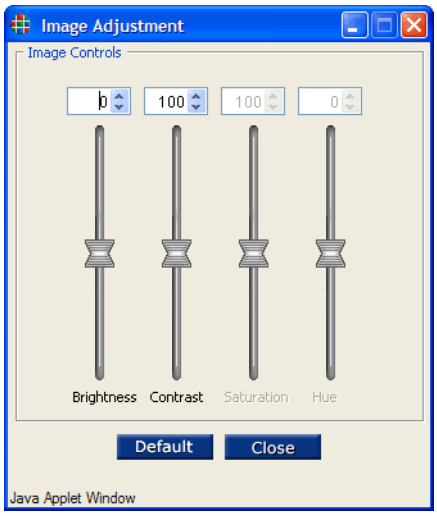


Figure 3-17 Image Adjustment Window

Two image adjustments can be made to the input signal:

- Brightness
- Contrast

These categories are enabled dynamically, depending on the selected input. To adjust a parameter, use the associated slider control or adjust numerically with the up/down selector.

MAKING TIMING ADJUSTMENTS

Timing List parameters can be used when the **Video Input** has been set to **RGB**. It is not generally necessary to manually set Input Timing if Autosync, the default, is enabled. In the default mode, the timing is synchronized to the input signal. If the source is slightly unstable, the autosync circuitry must constantly re-acquire the signal; selecting the timing from the list

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or manually setting parameters prevents this from happening. For more details on preset and user-defined timings please see the **Factory Timing List** section in Chapter 6.

- ~ Use the pull-down Input **Timing List** to select a pre-defined or user-defined set of input timing parameters. Once selected, the parameters can be loaded or saved. If the timing is user-defined, it can also be deleted.
- ~ Click **Load** to load the selected set of timing parameters into the system's active input registers. If desired, the parameters can be edited using the fields in the **Video Input Timing** section.
- ~ Click **Save** to save a modified set of timing parameters. Registers 100 - 160 are reserved for user-defined parameters. A prompt will ask to select and name a register.
- ~ Click **Delete** to delete a selected user-defined timing register. Preset registers can not be deleted.

- The timing parameters displayed in the **Video Input Timing** section of the page relate to the settings currently in use. When a set of timing parameters is selected from the drop-down menu, the timings shown in the **Video Input Timing** section are not updated until **Load** has been clicked. To view the timing values before loading them, check the **Show Timing Values** check box. When the box is checked and a new entry is selected the values associated with the new entry will be displayed in the **Video Input Timing** section in red.
- In the **Video Input Timing** section, click **Edit** to activate all input timing fields for modification. In Chapter 6, refer to the **INputTiMing** command description for technical details on all input parameters.

Important Only qualified engineering personnel should adjust or modify video input timing parameters.

The parameters are:

HFP	Horizontal Front Porch	**VFP**	Vertical Front Porch
HSYNC	Horizontal Sync	**VSYNC**	Vertical Sync
HBP	Horizontal Back Porch	**VBP**	Vertical Back Porch
HACT	Horizontal Active	**VACT**	Vertical Active

Modified timing parameters can be saved using **Save**.

- In the **Interactive Adjustment** section, controls are provided to enable qualified engineering personnel to interactively adjust input timing and input modulus parameters for the active screen area. Interactive adjustments can be used to fine tune the settings for non-standard video input signals.

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To return to autosync for RGB again select **RGB** for **Video Input**. Input video Autosync is restored.

CREATING A NEW TIMING ENTRY

If there is no entry in the timing list that matches a specific signal, a new one can be created. Find an entry in the list that is very close to the required parameters. Load the entry, modify it, and then save the new entry to the user defined timing list. There are over 100 available user entries.

Use the following procedure to create a new (user defined) entry in the timing list:

- Click the **Edit** button in the **Input Timing** section of the **Input Timing** page.
- Enter new timing parameters into each of the timing parameter boxes.
- Scroll to an empty timing list number above #100 in the **Timing List** entry box.
- Click the **SAVE** button.

  A dialog box will open allowing you to name the new entry.
- Enter a name for the new timing entry and click **OK**.

  The name can be up to 23 characters in length and can contain upper and lower and numeric characters. Avoid the use of a space or the / or \ characters.

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OUTPUT TAB

Use the **Output** tab to view the current output timing settings and to loading different settings. Typically, the output timing matches the timing parameters of the recorded image (***Playback*** mode).

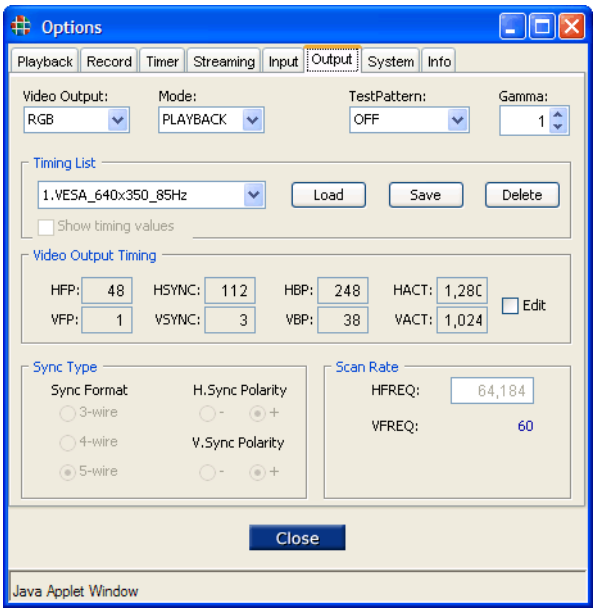


Figure 3-18 Output Tab

VIDEO OUTPUTS

Use the pull-down **Video Output** menu to select the desired output format: **RGB** or **DVI**. When one format is enabled, the other is disabled.

OUTPUT DISPLAY MODE

Select the **Mode** between the ***Playback*** and ***Freerun*** modes. In the ***Playback*** mode, the output timing parameters are automatically loaded to match the format of the played clip. In the ***Freerun*** mode, the output timing can be changed to suit the output device; the **Timing List** is enabled.

TEST PATTERN

Select a test pattern to display on the output port. Use a test pattern to confirm that the output is correctly connected to a display device.

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GAMMA

Use this adjustment when the replay device has a different gamma than that of the recorded image. An example would be between a CRT and an LCD monitor. The range is from 0.5 to 2 in increments of 0.05.

Note

The gamma of the input image recorded to disk is preserved. The **Gamma** control does not apply to the input image.

TIMING LIST

When the output **Mode** is set to **Freerun**, use the **Timing List** section of the **Output** tab to set the output format. Select the required format from the drop down **Timing List** and click on the **Load** button.

The timing parameters associated with the format selected from the **Timing List** are displayed in the **Video Output Timing** section of the **Output** tab. Click the **Edit** box to make changes to the parameters. Modified settings may then be saved to the **Timing List** by selecting an unused entry in the list, between 100 and 160, and clicking the **Save** button. Unwanted entries to the **Timing List** can be deleted by selecting an entry and clicking **Delete**.

To return to the default autosync mode, set the output **Mode** to ***Playback***.

VIDEO OUTPUT TIMING

Output timing parameters are displayed for the timing selected from the **Timing List**. These parameters may be edited checking the **Edit** box.

Important

Changing timing parameters should be done by experienced video engineers only.

See **Making Timing Adjustments** on page 49 for more information on timing parameters.

SYNC TYPE

Select the synchronization parameters as required.

SCAN RATE

Set the **Scan Rate** parameters as required.

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SYSTEM TAB

The **System** tab is used to view and set communications and clock parameters.

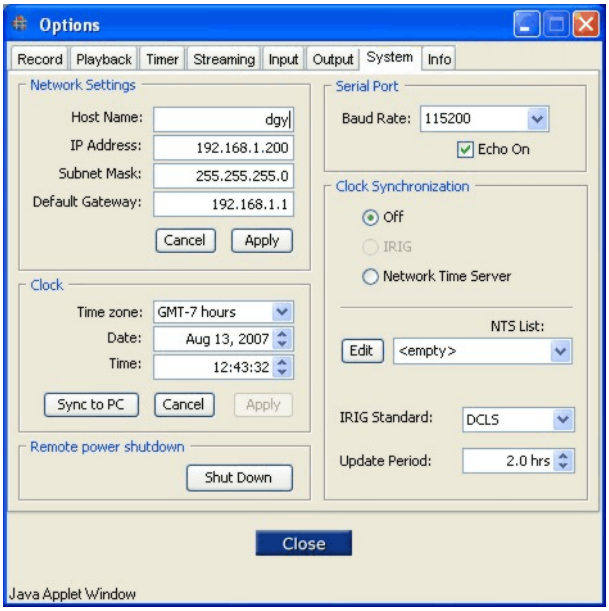


Figure 3-19 System Tab

NETWORK SETTINGS

- In the **Network Settings** section:
  - ~ Fields are provided to display current settings or to change the system's IP address, host name, subnet mask, and default gateway.
  - ~ After changes are made, click **Apply** to apply the new settings to the *DGy 201x*.

    Changes to network settings will not be applied to the *DGy 201x* until the unit has restarted. When **Apply** is clicked, the **Restart Warning** is displayed. (**Figure 3-20**.) Click **No** to cancel the reboot and go back to the old network settings; click **Yes** to restart the *DGy 201x* using the new network settings.

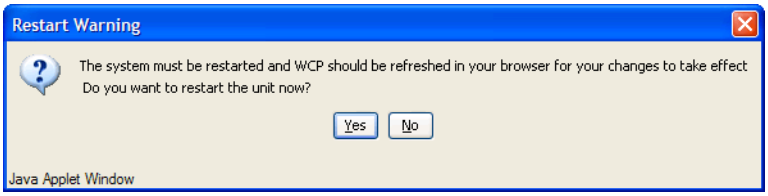


Figure 3-20 Restart Warning Message

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The DGy Control Panel will lose communication with the *DGy 201x* as soon as the restart procedure begins. If the IP address of the *DGy 201x* has been changed, the new network settings must be used to reconnect to it. After the connection has been dropped, the WCP or Telnet session must be restarted.

SERIAL PORT SETTINGS

The current serial port baud rate is displayed and can be changed in this section of the **Systems** tab. Available baud rates range from 9600 baud to 115,200 baud. It is recommended that the default baud rate, 115k baud, be used. To change the serial port parameters:

- Use the pull-down **Baud Rate** menu to set the baud rate for the system's RS-232 serial port. The default value is 115,200 baud.
- Check the **Echo On** box to enable echo.

CLOCK SETTINGS

The *DGy 201x* uses an internal real-time clock to time stamp the recordings.

The DGy system time and date can be set manually or synchronized to the PC controlling the *DGy 201x*.

- In the **Clock** section:
  - Click **Sync to PC** to load the PC's local time into the *DGy 201x*'s temporary clock register.
  - Use the **Date** and **Time** up/down selectors to adjust the date and time as necessary.
  - Identify the Time Zone the *DGy 201x* is located in by using the drop down **Time Zone** box.
  - Click **Apply** to upload the new time setting into *DGy 201x*'s active clock register.

OR

  - Specify the time zone the *DGy 201x* is in by using the drop down **Time Zone** box.
  - Use the entry boxes to manually set the **Date** and **Time**.
  - Click **Apply** to upload the new time setting into *DGy 201x* active clock register.

    When **Apply** is clicked, a **Restart Warning** is displayed. (**Figure 3-20**.) Click **No** to cancel the reboot and go back to the old time and date values; click **Yes** to restart the *DGy 201x* using the time and date values. A

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warning message is displayed asking to reboot immediately. If the DGy is rebooted, the WCP or Telnet session must be reactivated.

CLOCK SYNCHRONIZATION

The *DGy 201x* internal real time clock can be synchronized to an external time reference so that it is always set accurately. Accurate time references are provided by conventional Network Time Servers (NTS) over the internet using the Network Time Protocol (NTP). Alternatively an optional IRIG-B time reference can be used. The Clock synchronization section provides the ability to set operation with either type of external time reference.

Radio buttons are provided to set the *DGy 201x*'s timecode synchronization functions, including NTS and IRIG (IRIG-B is an optional *DGy 201x* feature) assignments.

NTS Time Synchronization

- At least one IP address must be in the NTS List before the **Network Time Server** radio button can be selected. Up to three IP addresses can be set. Be sure that the *DGy 201x* can access the time server over the network connection. In Chapter 6, refer to the **RealTimeClockSYNC** command description for details.
- To put an entry into the NTS list box, click on the **Edit** button associated with the NTS list.
- Enter the new server IP address and press **ENTER**.
- To change an existing entry, first select the desired device using the drop down **NTS** list box. Click on the **Edit** button. Enter the new server IP address into the **NTS** list box and press **ENTER**.
- Click the **Network Time Server** radio button to activate NTS synchronization.

OR

IRIG-B Time Synchronization

- If the IRIG option is installed, the **IRIG Standard** must be selected before the IRIG radio button can be selected. Select the required input type, DCLS or 1kHz modulated, using the drop down menu.
- In the **Clock Synchronization** section click the **IRIG** radio button to activate IRIG synchronization.

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Update Period

The internal clock is synchronized to the currently selected reference signal (NTS or IRIG) periodically. Adjust the length of time between updates by defining the update period in the entry box provided. The default period is 2 hours but the rate may be set from a minimum update period of 30 minutes to a maximum update period of 24 hours; entries may be made in increments of 30 minutes. Having a short update period may be required when using multiple *DGy 201x* recorders in a time-synchronized application.

REMOTE SHUTDOWN

Click the **Shutdown** button to remotely power off the *DGy 201x*. The recorder will go through the same shutdown procedure as when the front panel power switch is used. Follow the on-screen prompts to confirm or cancel shutdown. Shutdown will take 10 to 15 seconds to complete. During shutdown, the power indicator on the DGy will remain lit, but the system will be inoperable. When shutdown is complete, the WCP may be closed.

Important

Do not remove the power cord from the rear of the DGy until the shutdown process is complete. Failure to wait for the normal shutdown procedure to execute may cause loss of data.

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INFO TAB

The figure below illustrates the **Info** tab:

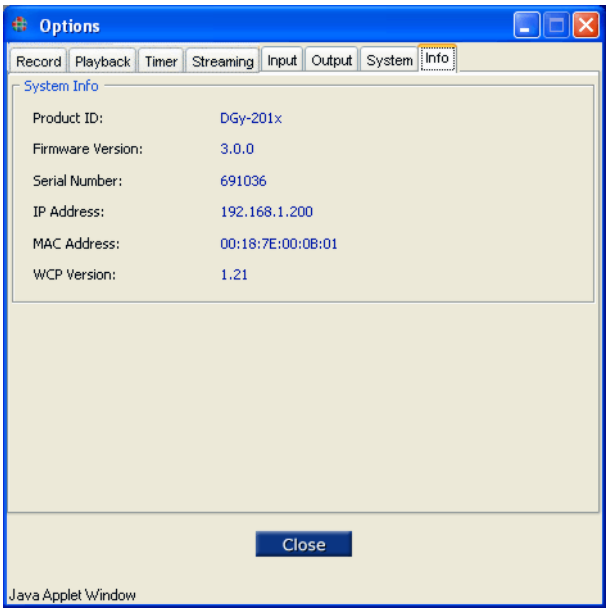


Figure 3-21 Info Tab

The **Info** tab displays information about the *DGy 201x* including:

- Product ID
- Firmware version
- DGy Control Panel version
- Serial number
- IP address
- MAC address
- WCP version

COMMAND LINE CONTROL

The WCP provides a terminal emulator that can be used to issue serial commands from a PC and to read commands as they are issued from the DGy Control Panel. This is useful when developing scripts for controlling *DGy 201x* from an external controller. For details about serial commands see **Chapter 6** on page 85.

- To open the Terminal Window:
  - ~ Locate the DGy Web Control Panel Configuration Page that opens automatically when the *DGy 201x* WCP is launched (**Figure 3-22**).

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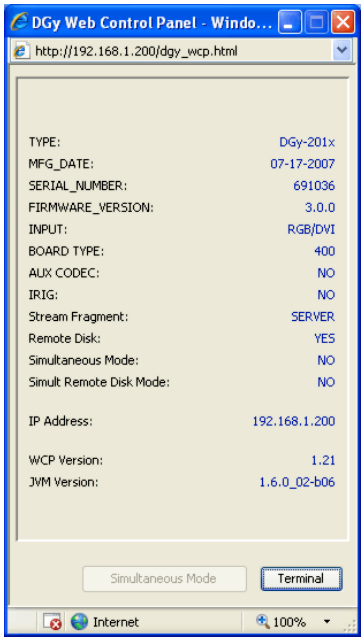


Figure 3-22 DGy WCP Configuration Page

~ Click on the **Terminal** button at the bottom of the **Configuration Page**. A **Terminal** window similar to that shown in **Figure 3-23** will appear.

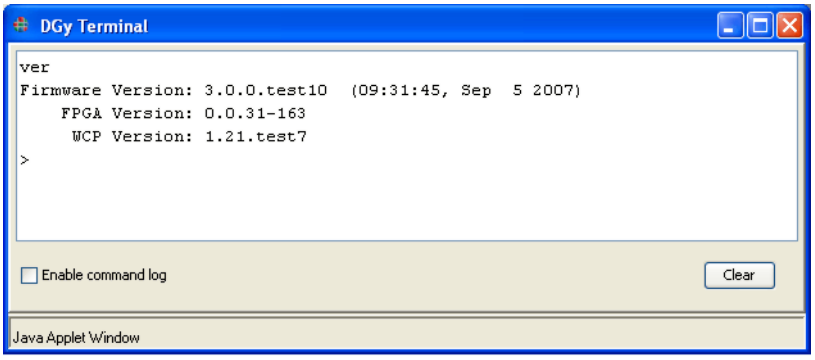


Figure 3-23 Terminal Window

- Using the **Terminal** window:
  - ~ When the terminal window is open it is ready to use; click inside the window to begin making entries.
  - ~ Type the desired command at the command prompt including any optional or required arguments and press **ENTER**.

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▲ **Example:** To test the terminal operation, type **ver** at the terminal command prompt and press **ENTER**. The terminal should respond with a message similar to that shown in **Figure 3-23**.

- Enable command log

  When the **Enable command log** box is checked all commands entered from the terminal or issued from the DGy Control Panel are displayed. When unchecked, only terminal commands and system responses are displayed.

Important

Only use the command log as a guide to controlling the *DGy 201x* from the command set. The DGy Web Control Panel application supports functions not available in the command set. Use the log as a starting point and be ready to simplify the result.

- Clearing the Terminal window

  ~ To clear the contents of the Terminal window click on the **Clear** button at the bottom of the Terminal window.

COMMAND LOG

The **Terminal** window can be used to log commands that are sent from the DGy Control Panel to the *DGy 201x*. This is particularly useful for debugging or in the development of a script for an external controller using the command line interface. See **Chapter 6** for details about each command.

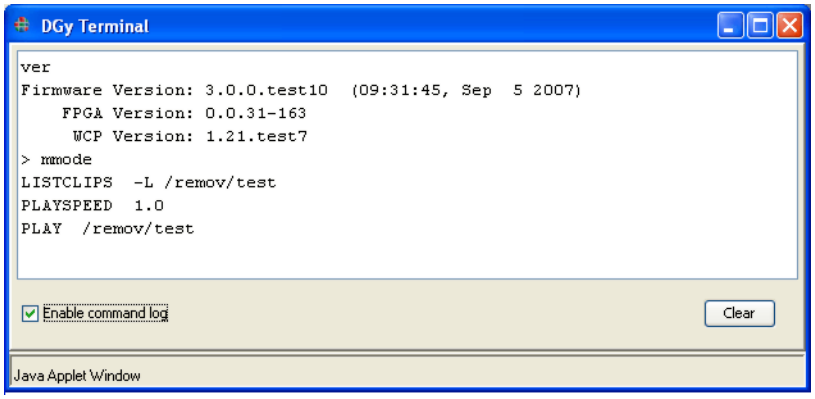


Figure 3-24 Terminal Window Configured for Logging

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RECORDING CLIPS

Before proceeding with this setup, refer to **Before Starting** on page 24 for important setup and connection information.

The first step in making a recording is to decide where to store the recording. The recording can be stored on the local removable drive, optional fixed drive or on an optional remote network attached storage device. A file may be stored in a particular directory or a new directory may be created.

MOUNTING A REMOTE DISK OPTION

If the *DGy 201x* has the Remote Disk Mount option, an external disk can be mounted over a network. Before beginning the process of mounting a remote disk, the NFS server on the remote device must be set up. The *DGy 201x* supports remote disk mount activity only with Allegro for Windows PC platform, or Linux based NFS servers. Allegro is a low cost server for the Windows platform and can be downloaded from the following web site: **http://nfsforwindows.com/home**

It is strongly recommended that the IT manager be consulted for assistance before proceeding.

Use the following procedure to mount a remote disk.

1) Open the **Clip Browser** from the **DGy Control Panel** window by clicking in the **Clip Path** section. See **Clip Browser Window** on page 35.

2) Click on **File** in the Clip Browser tool bar.

3) Select **Network Drive ...** from the **File** drop down menu.

4) Enter the path name to the remote disk in the **Mount Network Drive** pop-up window (**Figure 3-25**). The path name consists of two parts, the IP address of the remote storage device, and the name of the shared space that has been created on the device (known as the NFS name). Obtain this information from the IT manager or network support specialist.

▲ **Example**: If the IP address of the network drive is 192.168.1.59, and the storage area on the drive has been set up as usr/dgy, enter the following into the **Mount Network Drive** address line:

192.168.1.59:/usr/dgy

5. Click the **Mount** button.

If the remote drive is found it will be displayed with the other drives in the left pane of the **Clip Browser** and listed as **\remot**.

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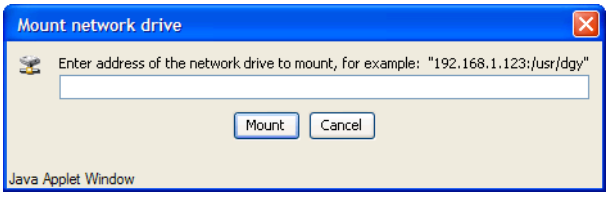


Figure 3-25 Remote Disk Mount Network Drive Window

Note

To unmount a network drive, an alternate drive must first be selected. From the **File** menu, select **Network Drive,** then **Unmount**.

CHOOSING A RECORD DESTINATION

Recordings can be made to the internal disk (removable or optional fixed disk) or an externally mounted drive (NFS disk mount option). Selection of the destination is made from the **Clip Browser** using the following procedure.

Note

The removable drive is named **/remov**, the fixed drive is named **/fixed** and the remote NFS drive is named **/remot.** Do not to confuse the remote and removable disk names.

1. If the **Clip Browser** is not open, open it from the **DGy Control Panel** by clicking the **Clip Path**. See **Clip Browser Window** on page 35.
2. Use the left pane of the browser (**Figure 3-6**) to navigate the desired drive and folder.
3. To create a new folder click on the **New Folder** icon on the **Clip Browser** toolbar or select **New Folder** from the **File** menu. Enter a name in the pop-up dialog box and click **OK**.

RECORDING A CLIP

Use the following procedure to record a clip with *DGy 201x*.

1. From the DGy Control Panel, click **Options** to display the **Options** window.
2. Click the **Record** tab and set the desired recording parameters, including input signal selection, quality level, frame rate, and auto-naming. Refer to the **Record Tab** section on page 40 for details.

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3. Click the **Input** tab and to set up input parameters, including RGB/DVI input selection, audio recording parameters, and image adjustments. If the *DGy 201x* has not automatically locked to the input source then the timing parameters can be selected from the **Timing List**. In the **Timing List** section, select the timing that matches the input signal and click **Load**. Refer to the **Input Tab** section on page 48 for details.
4. Click **Close** to return to the **DGy Control Panel**.
5. On the **DGy Control Panel**, click the **Record** button to begin recording the new clip.
6. If the **Enable Clip Auto Naming** box (page 41) was checked on the **Record** tab of the **Options** window, recording will begin immediately. If the autoname is disabled, a clip name dialog box will open providing the opportunity to name the clip.

Note Spaces cannot be used in clip names.

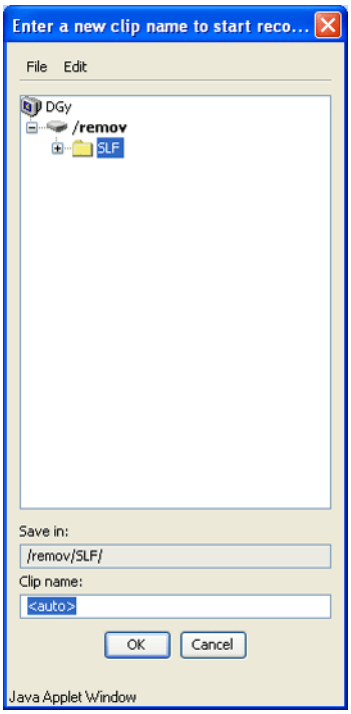


Figure 3-26 Entering a New Clip Name

Navigate to the desired drive or folder. Enter a new clip name or leave <auto> in the **Clip name** box and click **OK** to begin recording.

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7. As required, click the **Pause** button to pause recording, or the **Stop** button to stop recording. Once stopped, the recording can be played back. Refer to the **Playing Clips** section on page 64 for details.

PLAYING CLIPS

Before proceeding with this setup, refer to **Before Starting** on page 24 for important setup and connection information.

To play back a clip from an optional remote disk drive connect to the disk using the procedure described in the **Mounting a Remote Disk Option** section on page 61.

CHOOSING A PLAYBACK DRIVE

Playing back a recording can be done from the removable drive, optional fixed drive, or from a remote drive using the optional NFS mount.

1. If the **Clip Browser** is not open, open it from the **DGy Control Panel** by clicking **Clip Path**. See **Clip Browser Window** on page 35.
2. Use the left pane of the browser (**Figure 3-6**) to navigate to the drive and folder that contains the desired clip.

   The removable drive is named /remov and the remote drive (NFS) is named /remot. Do not to confuse the names.

PLAYBACK A CLIP

Use the following steps to play back a clip with *DGy 201x*.

1. If a clip was just recorded on the **DGy Control Panel**, simply click the **Play** button to play back the same clip.
2. To play back a different clip, click the **Clip Name** label to display the **Clip Browser** window**.**

Note

> The Player/Recorder must be stopped before a clip selection can be made.

3. In the **Clip Browser**, highlight the desired clip and click **Select**. The clip is transferred to the Clip Name field in the **DGy Control Panel**. Click the **Play** button.

   OR

   Double click the desired clip name in the Clip Browser window to immediately begin play.

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4. To play the *previous* clip in the **Clip Directory** without accessing the **Clip Browser** window, click the **Previous Clip** button. *DGy 201x* will cue to the beginning of the clip. Click on the **Play** or **Pause** button to play back the clip.
5. To play back the *next* clip in the **Clip Directory** without accessing the **Clip Browser** window, click the **Next Clip** button. *DGy 201x* will cue to the beginning of the clip. Click on the **Play** or **Pause** button to play back the clip.

Note

> **Next Clip** and **Previous Clip** work in the ***Play*** and ***Pause*** modes only.

CLIP PROTECTION

Clips can be protected to prevent accidental overwrite or deletion. Please note, event marks cannot be inserted to a protected clip. The protect status of each clip is shown in the **Clip Browser**. In Figure 3-27, clip **test1** is protected as indicated by the lock icon.

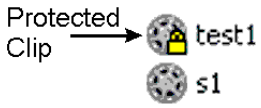


Figure 3-27 Protected Clip

To set the protection on a clip:

1) Open the **Clip Browser**.
2) Click on the desired clip.
3) Click on the **Edit** button on the **Clip Browser** tool bar.
4) Click on **Protected** (check mark will indicate protected clip).

To remove the clip protection.

1) Open the **Clip Browser**.
2) Click on the desired clip.
3) Click on the **Edit** button on the **Clip Browser** tool bar.
4) Click on **Unprotected**. The check mark will clear indicating an unprotected clip.

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MULTICAST STREAMING

The *DGy 201x* offers multicast streaming capability to send live, single-channel, high resolution graphics images with audio from one DGy to one or more remote DGy units. Multicast streaming encodes the input signal on the host DGy for network transmission to remote client DGy codecs. Remote DGy codecs subscribe to a multicast stream, receive the stream, and instantly decode it for live viewing with synchronized audio. DGy decoder units can be in any physical location with no limit on the number of multicast participants.

Examples of multicast streaming performance are:

- 1280 x 1024 at up to 30 frames per second
- 1600 x 1200 at up to 20 frames per second.

The Table 3-2 lists the basic information regarding Multicast streaming on the *DGy 201x*.

Table 3-2 Multicast Streaming Info

Stream Type	Protocol	Default Port	Default IP Address	Client Platform
Multicast	UDP	6001	225.0.0.37	*DGy 201x*

Multicast streaming uses a Class D IP address and port on the *DGy 201x* acting as the stream-out server. The client *DGy 201x*(s) can then subscribe to the stream by connecting to the IP address and port. Refer to **Figure 1-3**, page 9 for a setup diagram.

Note

The inclusion of audio and the audio frequency for multicast streaming will be set according to the settings in the Audio Settings dialog (**Figure 3-16**) of the **Input Tab**. The shortest latency occurs when Multicasting only video. Latency increases with a decrease in audio frequency. For the lowest latency while Multicasting with audio, set the audio frequency to 44.1 kHz.

STREAMING CONTROL PANEL

The streaming control panel is located at the bottom right corner of the standard DGy Control Panel. The panel is shown below.

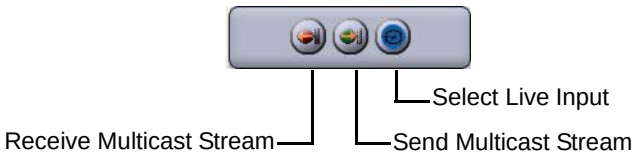


Figure 3-28 Streaming Control Panel

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SETTING UP A MULTICAST SERVER

Follow the steps below to setup the multicast server.

- Click on the **Stop** button to halt playback or record.
- If the simultaneous control panel is open, close it and open the standard **DGy Control Panel.**
- Click on **Options** and select the **Streaming** tab. Default parameters for **Multicast Stream In** and **Multicast Stream Out** are displayed. To change the stream out **IP Address** or **Port Number**, double-click on the respective field and enter the desired value.
- To use interframe compression, click the button on the **Streaming** tab to display the interframe compression adjustment window. See page 45 for a description of the window and for a full discussion of interframe compression use. After settings have been made, close the window.
- Close the **Options** Window.
- On the streaming control panel, click the Select Live Input button.
- On the streaming control panel click the **Send Multicast Stream** button. The **Multicast Stream Info** window for the output shown below will open.

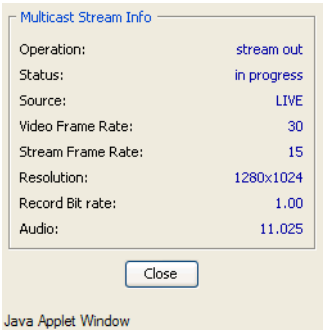


Figure 3-29 Multicast Stream Out Info

- Stop the multicast stream out by pressing the **Stop** button on the **DGy Control Panel Player** screen.

SETTING UP A MULTICAST CLIENT

Each *DGy 201x* designated a client to receive the multicast transmission needs to select the proper Stream In IP address and port number that were assigned on the DGy multicast server.

Follow the steps below to setup the multicast client.

- Click on the **Stop** button to halt all playback.
- If the simultaneous control panel is open, close it and open the standard **DGy Control Panel**.
- Click on **Options** and select the **Streaming** tab.

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- Set the **Multicast Stream In IP Address** and **Port Number** to match the values of the **Multicast Stream Out** of the server DGy.
- Close the **Options** tab.
- Click the **Receive Multicast Stream** buttonon the streaming control panel. The **Multicast Stream Info** window for the incoming signal is shown in **Figure 3-30**.

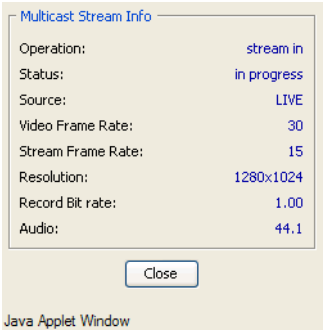


Figure 3-30 Multicast Stream In Info

- Stop receiving the multicast stream by pressing the **Stop** button on the DGy Control Panel.

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SIMULTANEOUS RECORD/PLAY OPTION

When the simultaneous record/play option is installed, the WCP Configuration window provides a button to switch between the standard and simultaneous mode, displaying the associated DGy Control Panel. See **DGy Control Panel** on page 22.

When the **Simultaneous Mode** is selected, the DGy Control Panel displays separate control panels for Record and Playback channels. The Playback Channel display and controls are identical to those in the standard DGy Control Panel with the Record button removed. See the **DGy Control Panel** on page 25.

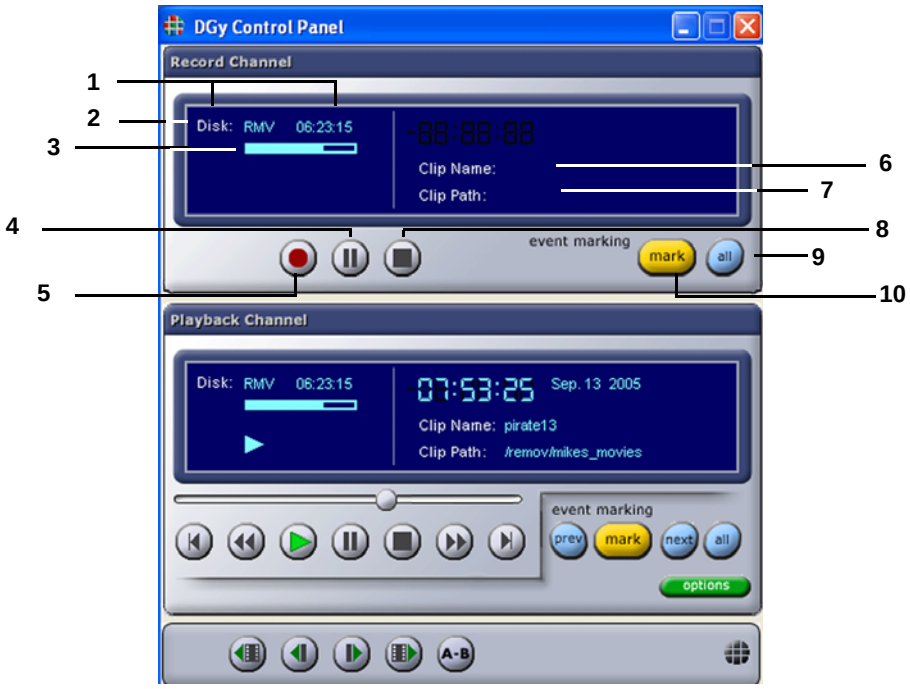


Figure 3-31 Simultaneous Record/Play DGy Control Panel

The **Record Channel** functions are:

1	**Record Disk Status**	6	**Record Clip Name**
2	**Record Disk**	7	**Record Clip Path**
3	**Record Disk Capacity Indicator Bar**	8	**Record Stop**
4	**Record Pause**	9	**Show All Record Event Marks**
5	**Record**	10	**Place Mark**

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1) Record Disk Status

This region indicates the selected disk drive and the amount of disk space remaining in **H:M:S** (hour:minutes:seconds).

2) Record Disk

Indicates the currently selected mounted disk, internal or remote.

3) Record Disk Capacity Indicator Bar

This bar visually indicates the available record time on the selected disk drive. The blue area represents the used portion of the disk as a percentage of the whole.

4) Record Pause

Click **Record Pause** to pause a recording. The ⏸ symbol appears in the status area. To resume recording click on the **Record** or **Pause** button.

5) Record

Note

> Recording must **precede** playback when operating in simultaneous record/playback mode. Press **Stop** in the player control panel.

The recording will use the parameters established on the **Record Tab** in the **Options Window** on page 39.

The recording will be stored using the **Record Clip Name** and **Record Clip Path**. See below for details.

The ● symbol appears in the status area. When recording begins, the *DGy 201x* records the visuals from the graphics input port.

If autonaming is enabled, recording begins immediately. If the clip name has already been used, you will be asked to confirm to overwrite the clip.

6) Record Clip Name

This area indicates the name of the clip currently recording. Click the **Record Clip Name** label to display the **Clip Browser** to select clips for playback or recording. Refer to the **Clip Browser Window** on page 35 for details.

7) Record Clip Path

This area indicates the path of the current clip. Click the **Record Clip Path** label to display the **Clip Browser**. Use the browser to select clips for recording and set the desired path. Refer to the **Clip Browser Window** on page 35 for details.

8) Record Stop

Click the **Stop** button to halt the recording.

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9) Show All Record Event Marks

Click **All** to display the **Event Marking** window. See **Figure 3-2**, Event Marking Window, on page 30 and the succeeding paragraphs for more information on Event Marks.

10) Place Mark

During a recording, click **Mark** to set a mark immediately. A mark will be entered in the **Event Marking** list. Marks are automatically provided with a unique mark number derived from the timecode on the recording. The Event marks are saved with the clip and are accessible when played back.

Simultaneous Record/Play Operation

1. The Record and Play resolution of each clip must be identical. Use the **Clip Browser** to determine the value for the playback clip. This value is set on the Record and **Input** tabs of the Options window.
2. Simultaneous Record/Play functions only in single-channel mode.
3. The **Input Timing** and **Output Timing** must be identical.
4. The maximum settings are:

Quality	Medium, 1.0 bit rate
Frame Rate	15 fps
Resolution	1280x1024

OR

Quality	0.9 bit rate
Frame Rate	7 fps
Resolution	1600x1200

5. Event marks may be placed or deleted in simultaneous mode.
6. The following are **not** supported in simultaneous mode:
   - **Next Clip** or **Previous Clip**.
   - **Next Frame** or **Previous Frame**.
   - **Current Position Slider**.
   - Variable speed playback: slow reverse, fast reverse, slow forward, or fast forward.
   - **Goto Previous Mark** or **Goto Next Mark**.

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4 TRANSFERRING RECORDINGS

IN THIS CHAPTER

This chapter describes transferring recordings between a *DGy 201x* and an external storage device.

- File Transfers
- Transferring Files from the DGy
- Transferring Recordings to the DGy

Use of the FTP Client to update firmware is described in Appendix C.

FILE TRANSFERS

The *DGy 201x* records video and audio to disk. The disk can be a removable or optional fixed, or optional remote disk. Recordings, stored as one or more data files, can be transferred to an external device for subsequent viewing on a PC using the RGB Spectrum software player in conjunction with the Windows Media Player.

It is also possible to transfer files from an external drive to a *DGy 201x* for later replay on the *DGy 201x*. This method can be used if it is necessary to clone a *DGy 201x* recorder.

Transfer is accomplished using the *DGy 201x* FTP (File Transfer Protocol) client.

FTP TRANSFER TIME

Transfers can involve very large file sizes. The transfer rate on a typical network connection is similar to the rate at which the image can be stored to disk. This means that the transfer of files is approximately real-time; a clip that is 15 minutes in length will take approximately 15 minutes to transfer.

STARTING THE FTP CLIENT

The FTP Client is started from the **DGy Applications Suite** shown in Figure 4-1. See Connecting to the DGy Applications Suite on page 19.

Important If the **WCP** is currently open, close it. The **WCP** and **FTP** cannot operate at the same time.

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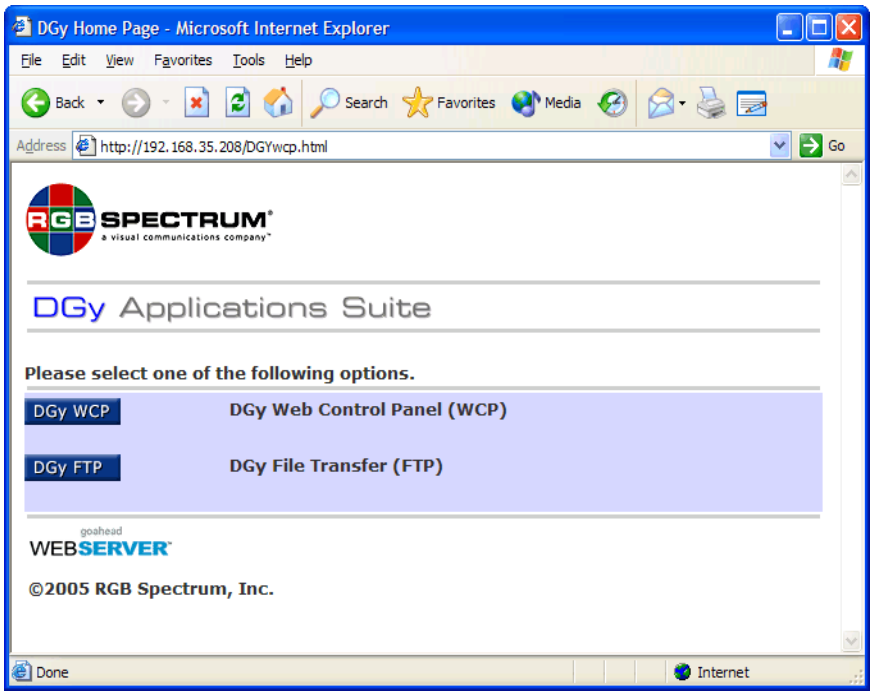


Figure 4-1 *DGy 201x* Application Suite Page

- Click on **DGy FTP** to open the file transfer window.

  A download file dialog similar to the one shown in **Figure 4-2** is displayed.

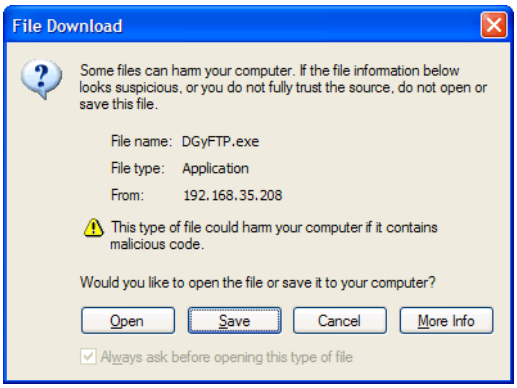


Figure 4-2 File Download Dialog Box

- To continue with setting up the FTP session click on the **Open** or **Run** in the **File Download** dialog box. If additional dialog boxes appear, due to security applications, select **Run** or **OK**, depending on the software. After a pause of about 15 - 20 seconds, the ***DGy 201x* FTP Client** window will be displayed.

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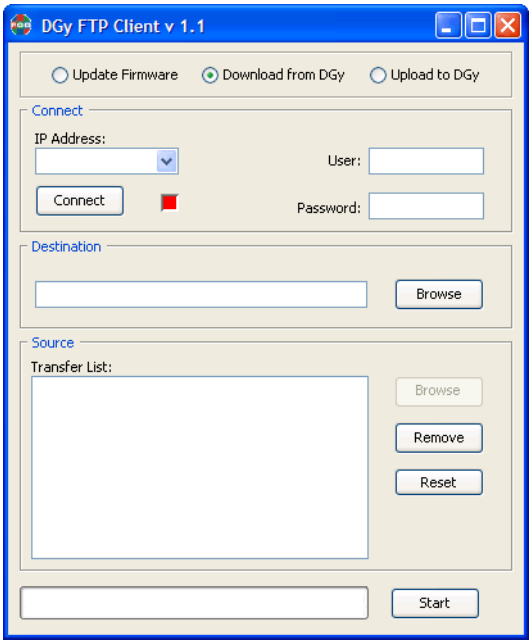


Figure 4-3 DGy FTP Client Window

CONNECTING TO THE DGy

1. Enter the IP address of the *DGy 201x* in the **IP address** entry box.
2. Type **rgb** into the **User** entry box (lower case only).
3. Type **spectrum** into the **Password** entry box (lower case only). The password will be hidden from view with each character replaced by the "*" symbol.
4. Click on the **Connect** button and wait for the status icon to the right of the button to change from red to green (this may take from 30 to 90 seconds depending on network traffic). The green icon indicates successful connection to the *DGy 201x* and that it is ready to download clips. See **Figure 4-4** below.

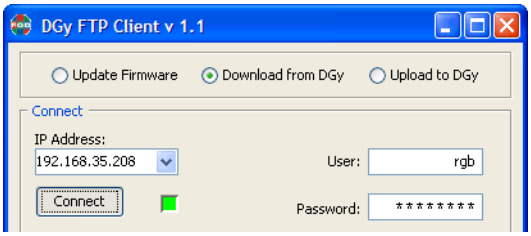


Figure 4-4 FTP Download Connection Established

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TRANSFERRING FILES FROM THE DGy

Use the following steps to set up and transfer files from the *DGy 201x* to a local computer.

1. Start the DGy FTP client. See **Starting the FTP Client** on page 72.
2. Connect to the DGy. See **Connecting to the DGy** on page 74.
3. Click the **Download from DGy** radio button to display the FTP download options as shown in **Figure 4-3**.
4. Click on the **Browse** button next to the **Destination** box to navigate to the desired device and folder in which to store the transferred files (see **Figure 4-5** below). Alternatively, if the path name is known, it can be typed directly into the **Destination** box.

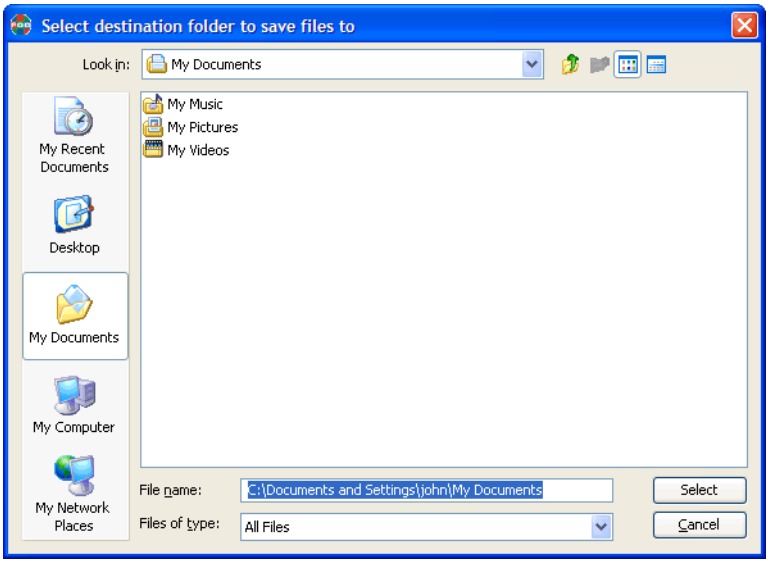


Figure 4-5 FTP Select Download Destination Folder

5. Click on the **Browse** button by the **Source** window to open the **Clip Browser** window shown in **Figure 4-6**.

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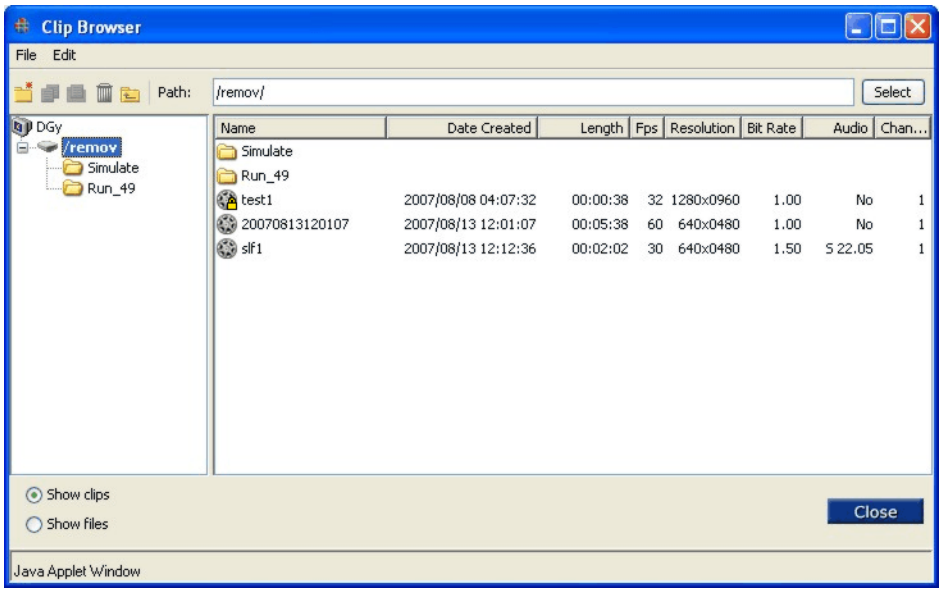


Figure 4-6 FTP Select Files to Download

6. Choose between the **Show clips** and **Show files** radio buttons at the bottom of the **Clip Browser** to view either a list of clips or a list of files.

Important

It is recommended that **Show clips** be used to make sure all the files associated with a clip are transferred. Failure to transfer all clip files will result in errors which will make the clip unusable.

7. Click on the clip or file to transfer and then click on the **Select** button or double click on the clip or file to add it to the **Source Transfer list** (Figure 4-8). Repeat this step for each clip or file to transfer.

Note

When a clip is selected, all underlying files associated with the clip will be added to the **Source Transfer List** and will be shown sequentially.

When all clips or files have been selected, the **Clip Browser** window may be closed or it may be left open to transfer files later.

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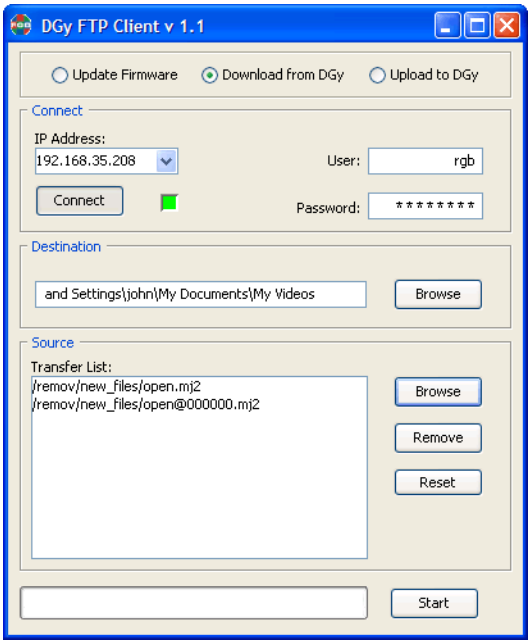


Figure 4-7 FTP Ready to Download Files

Important

No warning message will be displayed if the transfer will result in overwriting existing files with same-named files.

8. Click on the **Start** button to initiate the transfer of the files in the **Transfer list**. The clip files will be automatically transferred sequentially from the file transfer list. The file that is currently being transferred is indicated in the **File transfer** screen that appears as soon as the transfer process has been started (shown in the following figure).

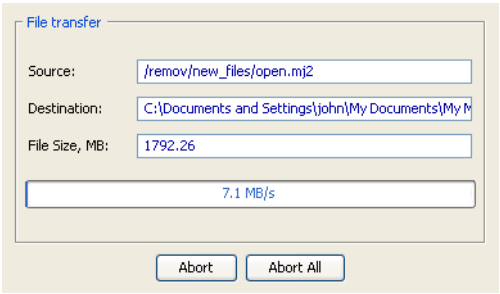


Figure 4-8 File Transfer Screen

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To terminate the transfer of the current file, click on the **Abort** button at the bottom of the **File transfer** window. To terminate the whole session click on the **Abort All** button. A dialog box will be displayed asking to complete the termination or resume the transfer.

The status of files in the **Source Transfer list** is indicated by color:

Black	Untransferred file
Gray	Transferred file
Green	File currently being transferred
Red	Transfer aborted file

TRANSFERRING RECORDINGS TO THE DGy

Although files are typically transferred from *DGy 201x* to an external device, they can also be imported from an external device to the *DGy 201x* using either the **DGy FTP Client** or the command line ftp method. Both methods are described in the following pages.

UPLOADING FILES VIA THE FTP CLIENT

Use the following steps to transfer files to a *DGy 201x*.

1. Start the DGy FTP client. See **Starting the FTP Client** on page 72.
2. Connect to the DGy. See **Connecting to the DGy** on page 74.
3. Click the **Upload to DGy** radio button to display the FTP upload options as shown in **Figure 4-9**.

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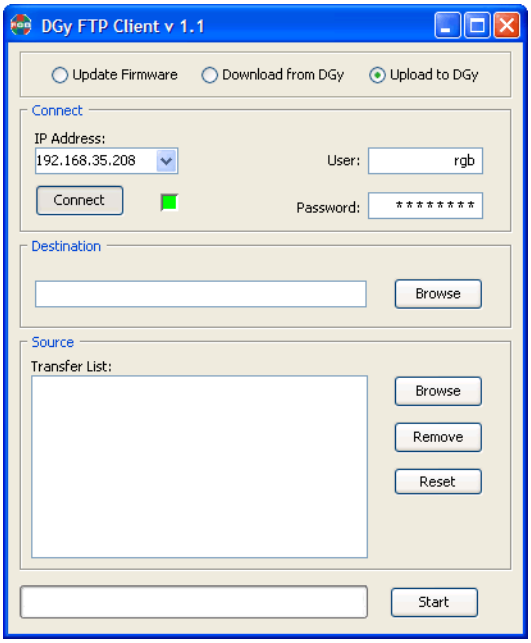


Figure 4-9 FTP Upload Dialog Box

4. Click on the **Browse** button next to the **Destination** box to navigate to the destination location within the *DGy 201x* for the transferred files and click **Ok**. See **Figure 4-10**. Alternatively, if the complete path is known, it can be typed directly into the **Destination** entry box.



Figure 4-10 FTP Upload Destination Folder

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5. Click on the **Browse** button next to the **Source Transfer List** to open the **Select files to upload to DGy** window shown in **Figure 4-6**.

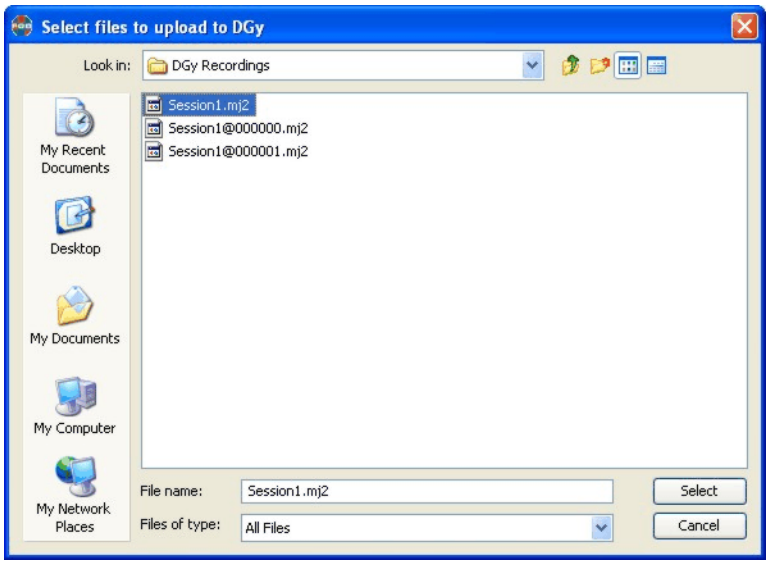


Figure 4-11 FTP Select Files Window

6. Click on the clip file to be transferred and click the **Select** button or double-click on the file. The file will then be added to the **Source Transfer list** (**Figure 4-8**). Repeat this step for each clip file to be transferred.

Important

Be certain that all files associated with a clip are included in the transfer list. Failure to transfer all files will result in errors which will make the clip unusable.

- To remove a file from the **Source Transfer list**, highlight the desired file and click **Remove**.
- To remove all clip files from the **Source Transfer list**, click **Reset**.

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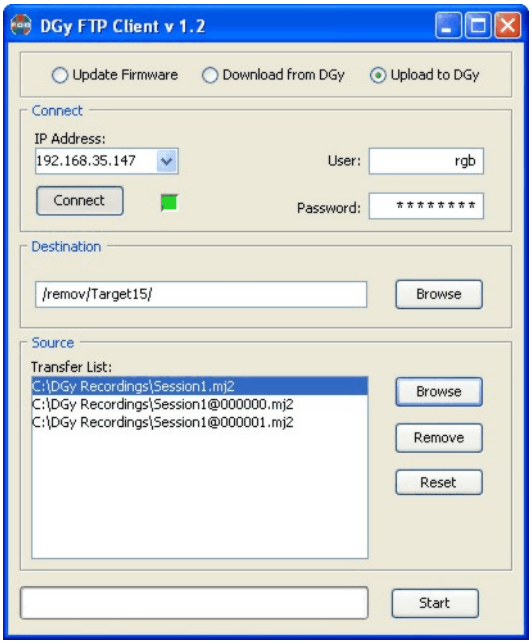


Figure 4-12 FTP Upload Transfer List

Important

No warning message will be displayed if the transfer will result in overwriting existing files with same-named files.

7. Click on the **Start** button to initiate the transfer of the files in the **Source Transfer list**. The clip files will be automatically transferred sequentially from the file transfer list. The file that is currently being transferred is indicated in the **File Transfer** screen that appears as soon as the transfer process has been started. See **Figure 4-13**.

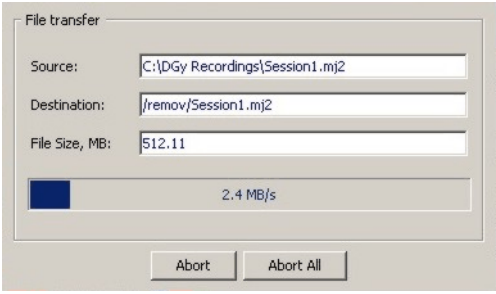


Figure 4-13 File Transfer Screen

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To terminate the transfer of the current file, click **Abort** at the bottom of the **File Transfer** screen. To terminate the whole session click on the **Abort All** button. A dialog box will request confirmation to terminate the process or to complete the transfer process.

The status of files in the **Source Transfer list** is indicated by color:

Black	Untransferred file
Gray	Transferred file
Green	File currently being transferred
Red	Transfer aborted file

UPLOADING FILES VIA FTP COMMAND LINE

Before starting to upload files using a command line, the correct path of all source clip files and the desired DGy destination folder must be known.

Use the following steps to transfer clip files via command line from a PC running Windows software to the *DGy 201x*.

Important All files associated with a clip must be uploaded. Failure to transfer all clip files will result in errors which will make the clip unusable.

1. From the Windows **START** menu, select **RUN**.
2. In the **RUN** dialog box, type: **cmd** then press **OK**
3. At the prompt, type: **ftp** <*ipadddress of the DGy*> then press **ENTER**.
   - **Example**: ftp 192.168.1.200
4. The *DGy 201x* will respond with a prompt requesting a user name. Type: **rgb** (lower case) and press **ENTER**.
5. The *DGy 201x* will respond with a prompt requesting a password.Type: **spectrum** (lower case) and press **ENTER**.
6. When the login confirmation message is displayed, select the binary file transfer mode by typing: **bin** and pressing **ENTER**.
7. From the prompt, type: **pwd** and press **ENTER**. This will report the DGy directory currently logged into (typically reported as **/rgb**).

   To copy files to the *DGy 201x* removable drive, type: **cd /remov** and press **ENTER**.

   To copy files to the *DGy 201x* fixed drive, type: **cd /fixed** and press **ENTER**.

   To copy files to a specific folder on a drive, type: **cd /<drive name>/<folder_name>** and press **ENTER**.

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To verify that the correct path has been selected, type **pwd** and press **ENTER**. The current path will be displayed.

8. Select the source directory on the PC hard disk by typing: **lcd <PC drive>\< PC directory>** and pressing **ENTER** (where **<PC drive>\<PC directory>** is the source directory path name)

   ▲ **Example**: lcd c:\DGy_Samples

Important

No warning message will be displayed if the transfer will result in overwriting existing files with same-named files.

9. To copy a single file from the PC to the *DGy 201x*, type: **put <filename>** and press **ENTER**

   To copy multiple files use the ftp **mput** function. *DGy 201x* recorded files have the file extension .mj2. To copy all files with that extension use the ftp command **mput *.mj2** and press **ENTER**.

10. To exit the FTP process, type: **bye** and press **ENTER**.

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5

PC PLAYBACK:
BASIC PC SOFTWARE PLAYER

IN THIS CHAPTER

This chapter provides installation information for the *DGy 201x* Basic PC software player plug-in for the standard Windows Media Player (version 10 or later).

PC SOFTWARE PLAYER

The *DGy 201x* encodes the input images using standard JPEG 2000 compression. Files recorded on the *DGy 201x* can be played on a PC running the Windows operating system. A copy of the Windows Media Player plug-in is included on the CD ROM provided with the *DGy 201x*.

To install the JPEG 2000 plug-in for the Windows Media Player:

1. Open the CD that contains the **DGy Basic PC Player** software.
2. Double click on **DGy PC Player Software Setup**. This will launch the familiar Install Shield Wizard.
3. Follow the prompts to load the software onto the PC.
4. Copy the **Simulator Sample** file to a folder on the PC's hard drive.
5. Launch the Windows Media Player.
6. From the Media Player **File**, choose **Open**, then select **All Files *.*.** Navigate to the folder which contains the sample file.
7. Click on the **Simulator Sample** file and click **OK**.

   If a pop-up message is displayed stating that the Media Player does not recognize the file extension, choose the option to let the Media Player attempt to play the clip anyway and click on the box to prevent this message box from being displayed again.

   The selected clip will load into Media Player and commence playback.

   To display the clip full-screen, use the keystroke sequence **ALT ENTER**. To return to normal size press the **ESC** key.

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6 COMMAND LINE INTERFACE

IN THIS CHAPTER

This chapter discusses the *DGy 201x* control command set, which provides access to all of the unit's functions. The factory timing list is also provided.

The following topics are discussed:

- **Command Overview**
- **Command Format**
- **Commands**
- **Commands**
- **Factory Timing List**

COMMAND OVERVIEW

All *DGy 201x* functions are accessible by means of ASCII commands that are used to set one or more system parameters (or values). The command set is made up of ASCII characters. Note that commands associated with file and path names are case sensitive. These commands may be used to control *DGy 201x* via the RS-232 serial port or via the Ethernet port using the internal *DGy 201x* Telnet server.

The *DGy 201x* can also be controlled using the supplied DGy Control Panel graphical user interface used on a PC with a standard web browser. Remote control is typically accomplished using a third-party controller connected to either the serial or Ethernet port.

COMMAND FORMAT

The following topics are discussed in this section:

- **Command Line Usage**
- **Command Help**
- **Predefined Parameter Values**
- **Query the Current Setting**
- **Parameter Ranges**
- **Optional Parameters**

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COMMAND LINE USAGE

All commands take the following form:

```
COMMAND_NAME <value1> <value2>...
```

... followed by **ENTER**.

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

▲ **Example**: Set *DGy 201x*'s baud rate to 115,200 bps:

```
BAUDRATE 115200
```

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 an abbreviation of the command name.

Note

With the exception of some interactive functions, commands are not case sensitive. In the **Command Index** and command descriptions, upper case characters in the long form version indicate the letters required for the command short form.

In the example above, the command `BAUDrate` could be entered in four ways:

```
BAUDRATE
baudrate
BAUD
baud
```



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

COMMAND HELP

▲ **Commands:** Help

There are two ways to use the *DGy 201x*'s help feature:

- Type `HELP` to list all *DGy 201x* commands.
- Type `HELP` followed by the command to get command-specific help.
  - ▲ **Example:** Type `H PLAY` to get help on the **Play** command.

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- **Example:** Type `H PLAYLOOP` to get help on the **PLAYLOOP** command.

- Type `HELP` followed by the first character or characters of the command name to get a list of all commands beginning with those characters.
  - **Example:** Type `H IP` to get help on the commands associated with IP addressing.

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:

```
<1200 | 2400 | 9600 | 19200 | 38400 | 57600 |
115200>
```

QUERY THE CURRENT SETTING

Many commands will report back on the current parameter settings. To establish the current parameters associated with the command, enter the command without any arguments. *DGy 201x* will respond with the current settings of the selected parameter.

- **Example:** To determine the current *DGy 201x* selection of input source, use the INputSouRCe command without entering an argument (this example assumes that the current input source is set DVI).

  The command:

```
INSRC
```

  would return:

```
DVI
```

PARAMETER RANGES

Parameter values may be a range indicated as:

```
<value1 ... value2>
```

- **Example**: The value of `GAMma` is a number in the range of

```
<0.5 .. 2.0>
```

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]
```

In this example, `<value>` is a required parameter and `[value2]` is an optional parameter.

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COMMANDS

The following sections list the commands used for controlling the *DGy 201x*. A table of all commands is provided, followed by lists arranged according to categories.

- **Command Summary**
- **Input Commands**
- **Image Commands**
- **Audio Commands**
- **Output Commands**
- **Play and Record Commands**
- **Streaming Commands**
- **Clip and Disk Commands**
- **Time Commands**
- **Miscellaneous Commands**

Note

Take the time to review each of these command lists, trying as many commands as possible with the *DGy 201x*. This will ensure familiarity with the full capabilities of the *DGy 201x*.

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COMMAND SUMMARY

This section provides a hyperlinked index of all *DGy 201x* commands in alphabetical order. Click the hyperlink to see a detailed description of the associated command.

Table 6-1 Alphabetical Command Summary

Command	Category	Description
AUDioFREQuency	Audio	Sets the sample rate (in kHz) of the audio input.
AUDioMoDe	Audio	Determines which, if any, audio source is recorded.
AUDioPHANTom	Audio	Supplies the low voltage phantom power, required by some microphones.
AUDioSouRCe	Audio	Determines whether input sensitivity is appropriate for microphone or line level signals.
BAUDrate	Miscellaneous	Sets the serial port baud rate.
BRIghtness	Image	Sets brightness value of the analog RGB video input.
BUZZerFUNCtion	Clip/Disk	Enables buzzer to sound when disk contents exceed the user specified threshold.
BUZZerReSeT	Clip/Disk	Turns the buzzer off, without changing *buzzfunc*.
CD	Clip/Disk	Changes to a new directory.
COMPressionINTerFRaMe	Record/Play	Turns interframe compression on or off.
COMPressionINTerFRaMe LENgth	Record/Play	Sets the maximum frame length for interframe compression.
COMPressionSENsitivity	Record/Play	Sets the amount of motion required to trigger interframe compression.
COMPressionTHReshold	Record/Play	Sets the variance per pixel to qualify as a change for interframe compression.
CONTrast	Image	Sets contrast value of the analog RGB video input.
CoPyCLIP	Clip/Disk	Creates clipname2 as an identical copy of clipname1.
CurrentCLIP	Clip/Disk	Displays the path and name of the clip currently being played.
CurrentTIME	Time	Displays current time of the DGy internal clock.
DELeteCLIP	Clip/Disk	Deletes named clip.
DELeteDIR	Clip/Disk	Removes the named (empty) directory.
DeleteMARK	Record/Play	Deletes the specified event mark if the event mark is in the clip currently being played.
ECHO	Miscellaneous	Turns the serial echo On/Off.
EditMARK	Record/Play	Names (or renames) the specified event mark.
ERASEFIXEDDISK	Clip/Disk	Erases the DGy (optional) fixed disk.
ERASEREMOVABLEDISK	Clip/Disk	Erases the DGy removable disk.
FrameNext	Record/Play	Steps to the next frame of a paused clip.
FramePrevious	Record/Play	Steps to the previous frame of a paused clip.

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Table 6-1 Alphabetical Command Summary (Continued)

Command	Category	Description
GAMma	Output	Sets the playback gamma.
HANDShaking	Miscellaneous	Selects hardware or software handshaking for the serial control port.
Help	Miscellaneous	Help, without an argument will display the entire serial command set.
HOSTNAME	Miscellaneous	Sets Ethernet hostname.
ID	Miscellaneous	Displays product ID, serial number, name, firmware version, date of manufacture and more.
INputAutoSync	Input	Engages the RGB input autosync circuitry.
INputFormat	Input	Reports the type of signal selected for record.
INputLOAD	Input	Loads the indicated entry from the Timing List to the RGB input channel.
INputMODulus	Input	Adjusts the sample point of the analog RGB analog/digital converter to optimize the digitized picture quality.
INputNAME	Input	Assigns a name to the input and its timing characteristics.
INputSAVE	Input	Saves the RGB input characteristic to the selected entry in the Timing List.
INputSouRCe	Input	Selects between DVI and RGB input types.
INputTiMing	Input	Sets the timing of the analog RGB input.
IPADDRess	Miscellaneous	Sets or reports the *DGy 201x* IP address.
IPGateWay	Miscellaneous	Sets or reports the IP gateway address.
IPSubNET	Miscellaneous	Sets or reports the system subnet mask.
IRIGSTandarD	Time	Sets the type of IRIG signal to be connected to the IRIG input.
LiStCLIPs	Clip/Disk	Displays a list of all recorded clips in the current directory.
ListEVeryMARK	Record/Play	Lists the timecode and description of all event marks in all clips on both disks.
ListMARK	Record/Play	Displays the timecode and description of the mark number specified.
MACADDRess	Miscellaneous	Displays the *DGy 201x* MAC address.
MachineSTATus	Record/Play	Displays the operational state of the DGy.
MARK	Record/Play	Creates an event mark within the current clip.
MKDIR	Clip/Disk	Makes a new directory. Relative or absolute pathnames are allowed.
MOUNT	Clip/Disk	Mounts an optional remote drive to the DGy file system.
NextCLIP	Record/Play	Moves from the current clip (in ***Play*** or ***Pause***) to the beginning of the next clip.
NEXTMARK	Record/Play	Sends the recorder to the next event mark from the current position and cues there.

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Table 6-1 Alphabetical Command Summary (Continued)

Command	Category	Description
NTSIP	Time	Sets the addresses of Network Time Servers used to synchronize the internal DGy clock.
OUTPUT	Output	A query command which returns information on the current output timing.
OutPuTForMaT	Output	This command selects the active format, analog RGB or DVI.
OutputMode	Output	Sets the output mode to ***FreeRun*** or ***PlayBack***.
OutPutTiMing	Output	Sets the timing for the current output.
OutPutTiMingLOAD	Output	Sets the output raster to the timing selected from the Timing List.
OutPutTiMingNAME	Output	Assigns a name to the current output timing.
OutPutTiMingSAVE	Output	Saves the timing data of the current output raster into the Timing List.
PAUSE	Record/Play	This command pauses the ***Play*** or ***Record*** mode.
PLAY	Record/Play	Switches the DGy to Playback mode and plays a previously made recording.
PLAYLOOP	Record/Play	Plays the current clip or list of clips to the end and automatically replays the list until stopped.
PLAYSPeeD	Record/Play	Set the playback speed. Applies to ***Forward*** and ***Reverse*** play modes.
PrevCLIP	Record/Play	Moves DGy from the current clip (in ***Play*** or ***Pause***) to the beginning of the previous clip.
PREVMARK	Record/Play	Sends the recorder to the previous event mark from the current position and cues there.
PROTECTCLIP	Clip/Disk	Change the status of an unprotected clip to protected.
PWD	Clip/Disk	Gives the absolute path of the current directory.
RealTimeClockSET	Time	Sets the internal DGy real time clock.
RealTimeClockSYNC	Time	Provides a means to synchronize a DGy to an external time reference or other DGy units.
RealTimeClockSYNCPERiod	Time	Sets the update rate for synchronizing the DGy internal clock to an external time reference.
RealTimeSeek	Clip/Disk	Places the DGy at the selected recording real-time within the selected clip.
RECord	Record/Play	This command switches the DGy to Recording mode.
RECordBitRate	Record/Play	Sets the degree of compression i.e. quality level (Stated in bits/pixel).
RECordFrameRate	Record/Play	Sets the rate at which input frames are compressed and stored to disk.
RECordLOOP	Record/Play	Enables or disables the disk overwrite feature.
RENameCLIP	Clip/Disk	Renames clipname1 to clipname2.

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Table 6-1 Alphabetical Command Summary (Continued)

Command	Category	Description
RestoreFactoryDefaults	Miscellaneous	Restores all user settings to their factory default values.
SeekToMARK	Record/Play	Sends the recorder to the specified event mark and cues there.
SHUTDOWN	Miscellaneous	Remotely shuts down the *DGy 201x*.
STOP	Record/Play	This command cancels *Play, Pause*, and *Record* functions.
StreamFragmentSTATus	Stream	Reports the multicast streaming state of the system.
STREAMIN	Stream	Initiates the incoming multicast stream for decoding and viewing.
STREAMINADDR	Stream	Sets or displays the incoming multicast stream IP address.
STREAMINPORT	Stream	Sets or displays the incoming multicast stream port.
STREAMINSTOP	Stream	Stops the incoming multicast stream.
STREAMOUT	Stream	Initiates the outgoing multicast stream transmission.
STREAMOUTADDR	Stream	Sets or displays the outgoing multicast stream IP address.
STREAMOUTPORT	Stream	Sets or displays the outgoing multicast stream transmission port.
STREAMOUTSTOP	Stream	Stops the outgoing multicast stream transmission.
SYNChronizedPLAY	Record/Play	Sets up the DGy to start playback of a specified clip at a pre-determined time.
SYNChronizedRECord	Record/Play	Sets up the DGy to start recording at a pre-determined time.
SYNChronizedSTATus	Record/Play	Reports the status of any queued synchronized commands.
SYNChronizedSTOP	Record/Play	Cancels all pending queued synchronized commands.
SYStemReSet	Miscellaneous	Restarts the DGy firmware.
TestPattern	Miscellaneous	Enables or disables the internal test patterns.
TimeCodeQuery	Record/Play	Returns the timecode at the current clip position.
TimeZone	Time	Sets the time zone relative to UTC.
TiMingDELete	Input	Deletes the specified timing entry from the Timing List.
TiMingLIST	Input	Displays the list of saved input and output timings.
TiMingLISTCLEAR	Input	Deletes all user entries from the Timing List.
TiMingLISTLOAD	Input	Create and save a custom timing list entry into the user space.
UMOUNT	Clip/Disk	Unmounts a remote drive from the DGy file system.
UNPROTECTCLIP	Clip/Disk	Change the status of a protected clip to unprotected.
UpdateFirmWare	Miscellaneous	Updates the firmware for the DGy.
VERsion	Miscellaneous	Displays the version numbers of the installed firmware components.
VOLumeINFO	Clip/Disk	Displays disk storage parameters.
VOLumeNAME	Clip/Disk	Used to read or write the DGy disk volume name.

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INPUT COMMANDS

The table below lists all *DGy 201x* input commands, their arguments and detailed descriptions.

Table 6-2 Input Commands

Command	Arguments	Description
INput**A**uto**S**ync	<AUTO | LOCK | DEBUG>	AUTO engages the input autosync circuitry. LOCK turns the autosync circuitry off. If the source is slightly unstable this prevents the autosync circuitry from constantly re-acquiring the signal. DEBUG provides information on input status, and reports changes to measured parameters (serial port only). Default: AUTO
INputFormat	(none)	INputFormat is a read only command that reports the type of signal selected for recording.
INput**LOAD**	<1..160>	Loads the indicated entry from the Timing List to the RGB input channel. This command only operates when an analog RGB signal is present and selected (with the **INputSouRCe** command). Otherwise an error message will be returned. Refer to the **Factory Timing List** section for additional details.
INput**MOD**ulus	(none)	This command provides a way to optimize the input timing for the analog RGB input to exactly sample the center of each pixel. A reasonably busy image is required for alignment (for example a screen with fine vertical lines or a screen with lots of fine text). After issuing the command the following letters may be pressed to make changes. i = increase modulus m =decrease modulus j = decrease phase l= increase phase J = move left L = move right I = move up M = move down **Note**: these are case sensitive. With the image properly adjusted, quit the utility: q = quit If the timing of the analog source is known, it should be entered with the **INputTiMing** command, but the INputMODulus command may still be used to set the sampling phase interactively.

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Table 6-2 Input Commands (Continued)

Command	Arguments	Description
INput**NAME**	<name>	Assigns a name to the input and its signal characteristics. The argument can be up to 23 alphanumeric characters with no spaces (underscore is acceptable). Default: Auto_1 This command only operates when an analog RGB signal is present and selected (with the **INputSouRCe** command). Otherwise an error message is returned.
INput**SAVE**	<100..160>	Saves the RGB input timing parameters to the selected entry in the Timing List. These settings are recalled whenever the signal is detected by the autosync circuitry, and the RGB input is selected. This command only operates when an analog RGB signal is present and selected (with the **INputSouRCe** command). Otherwise an error message is returned. If **INputSAVE** is issued for an already occupied position, the *DGy 201x* requests overwrite confirmation. Refer to the **Factory Timing List** section for additional details.
INput**SouRCe**	<RGB | DVI>	This command selects between an RGB or DVI input source. Default: RGB
INput**TiM**ing	<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>	This command sets the timing of the analog RGB input. The command can be used in two different ways. The syntax described here provides the ability to change or read the complete set of timing parameters with a single command. An alternate method allowing a change to a single parameter is shown in the next description (see below). **Note**: The vertical total can not be changed from the measured value; that is, the total of <vfp> + <vs> + <vbp> + <vact> must remain constant.
INput**TiM**ing (Alternate syntax)	<HFP | HS | HBP | HACT | VFP | VS | VBP |VACT| PHASE>[<value>]	Using the InputTiming command with the alternate syntax shown here provides the ability to change or read a single parameter of the current input timing. See above for the syntax that supports setting or reading all Input timing parameters as a single command.
TiMing**DEL**ete	<100..160>	Deletes the specified timing entry from the Timing List. Refer to the **Factory Timing List** section for details.

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Table 6-2 Input Commands (Continued)

Command	Arguments	Description
TiMing**LIST**	[<1..160> [<1..160>]] | [ACTIVE]	Displays the list of saved input and output timings. If two numeric arguments are supplied, displays all entries in the range. ACTIVE, displays only the active timings.
TiMing**LISTCLEAR**	(none)	Deletes all user entries from the Timing List.
TiMing**LISTLOAD**	<100 ...160> <name> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> <hfreq> <sync> <hpol> <vpol> <il>	This command is used to create and save a user timing set to the Timing List. User defined entries may be saved to the list using slots 100 - 160. Timing slots 1 - 99 are reserved for factory defined timing settings. The name parameter is a name that is used to identify the timing set (for example *mytiming3*). **hfp** - width of the horizontal front porch (pixels) **hs** - width of the horizontal sync pulse (pixels) **hbp** - width of horizontal back porch (pixels) **hact** - width of the active picture area (pixels) **vfp** - width of the vertical front porch (pixels) **vs** - width of the vertical sync pulse (pixels) **vbp** - width of vertical back porch (pixels) **vact** - height of the active picture area (pixels) **hfreq** - horizontal frequency (Hz) **sync** - type of sync signal (analog 3, 4 or 5 wire) **hpol** - polarity of horizontal sync pulse (0=negative, 1=positive) **vpol** - polarity of vertical sync pulse (0= negative, 1=positive) **il** - interlace (0 = non interlace, 1 = interlace)

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IMAGE COMMANDS

The table below lists all *DGy 201x* image commands, their arguments and detailed descriptions.

Table 6-3 Image Commands

Command	Arguments	Description
BRIghtness	<-500..500>	Sets brightness value of the selected input. Only valid for **INputSouRCe** of RGB. **Note**: This command is not active in the ***Play*** mode. The brightness or contrast cannot be adjusted during playback. Default: 0
CONTrast	<0..200>	Sets contrast value of the selected input. Only valid for **INputSouRCe** of RGB. **Note** This command is not active in the ***Play*** mode. The brightness or contrast cannot be adjusted during playback. Default: 100

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AUDIO COMMANDS

The table below lists all *DGy 201x* audio commands, their arguments and detailed descriptions.

Table 6-4 Audio Commands

Command	Arguments	Description
AUDio**FREQ**uency	<11.025 | 22.05 | 44.1>	Sets the sample rate in kHz of the audio input. Default: 44.1 (CD quality).
AUDio**M**o**D**e	<L | R | Stereo | OFF>	Determines which, if any, audio source is recorded. If **AUDioMoDe** is set to *L* or *R*, the audio is routed to both output channels on replay. If **AUDioMoDe** is set to Stereo, the Left and Right audio channels are routed independently to the Left and Right audio output connectors (Stereo or separate audio). If **AUDioMoDe** is set to OFF, audio is not recorded. **Note**: This command does not affect playback. A clip containing audio will be replayed independent of the setting of this command. Default: OFF
AUDio**PHANT**om	<ON | OFF>	Supplies the low voltage phantom power, required by some electronic microphones. The setting of **AUDioPHANTom** is ignored unless **AUDioSouRCe** is *MIC*. Default: OFF
AUDio**S**ou**RC**e	<MIC | LINE>	Determines whether input sensitivity is appropriate for microphone or line level signals. If **AUDioSouRCe** is set to *LINE*, phantom power is disabled automatically (but the setting of **AUDioPHANTom** remains unchanged). Default: LINE

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OUTPUT COMMANDS

The table below lists all *DGy 201x* output commands, their arguments and detailed descriptions.

Table 6-5 Output Commands

Command	Arguments	Description
GAMma	<0.5...2.0>	Sets the playback gamma. Default: 1.0
OUTPUT	(none)	A query command which returns information on the current output timing.
Out**P**ut**T**i**M**ing**LOAD**	<1..160>	Sets the output raster to the timing selected from the Timing List. In order to load the output timing parameters the *DGy 201x* must be in the ***FreeRun*** mode. (see **OutputMode**) Refer to **Factory Timing List**, page 118 for details.
Out**P**ut**T**i**M**ing**NAME**	<name>	Assigns a name to the current output timing. The argument can be up to 23 alphanumeric characters with no spaces (underscore is acceptable).
Out**P**ut**T**i**M**ing**SAVE**	<100..160>	Saves the timing data of the current output raster into the Timing List. The argument specifies which Timing List position is used. If **OutPutTiMingSAVE** is issued for an already occupied position, the DGy requests overwrite confirmation. Refer to the **Factory Timing List** section for additional details.
Out**P**ut**T**i**M**ing	<hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> <hfreq> <sync> <hpol> <vpol> <il>	Sets the timing for the current output.
Out**P**ut**T**i**M**ing (Alternate)	<HFP | HS | HBP | HACT | VFP | VS | VBP |VACT| HFREQ| SYNC | HPOL | VPOL | IL>[<value>]	Changes (or reports) one parameter of the current output timing.

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Table 6-5 Output Commands (Continued)

Command	Arguments	Description
Output**M**ode	[FreeRun | PlayBack]	In ***FreeRun*** mode, the output reflects the Output Timing numbers. In ***PlayBack*** mode, the output has the same timing as that of the recorded signal being played back. If the DGy is not in ***Playback*** mode, the output timing reflects the last clip played. Default: Playback
Out**P**u**TF**or**M**a**T**	[RGB | DVI]	The DGy has a DVI-I output connector, capable of carrying analog and digital outputs. Only one output format is active at any time. This command selects the format of the active output signal. Default: RGB

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PLAY AND RECORD COMMANDS

The table below describes the *DGy 201x* play and record commands, including event marks.

Note Clipname entries are case sensitive.

Table 6-6 *DGy 201x* Play and Record Commands

Command	Arguments	Description
Machine**STAT**us		Displays the operational state of the DGy. Record Record Pause Play Play Pause Stop Send Stream Receive Stream When the Simultaneous Record/Play option is installed, multiple values will be returned.
RECord	[-P] [clipname]	This command switches the DGy to ***Record*** mode. If an argument is given, that argument is used as the name of the clip. If no argument is given, the clip name reflects the record start time, in the form yyyymmddhhmmss. The optional -P argument places the recording into a ***Record Pause*** mode. In this mode the recorder will enter the record mode, but will not start recording until a subsequent **RECord** command is received. This provides the ability to set up the recorder for an instant start. **Note**: To switch from **Record** to any other recorder function, first issue the **STOP** command.

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Table 6-6 *DGy 201x* Play and Record Commands (Continued)

Command	Arguments	Description
SYNChronized**REC**ord	<clipname> <starttime>	The *SYNChronizedREC*ord command is used to schedule recording of a clip at a specified time. A clipname must be provided, and the start time must be specified using the time format yyyymmddhhmmss (24 hour time). **Example:** Start recording a clip named Rec227 at 3:05pm, June 9th 2005. `syncrec Rec227 20050609150500` The **SYNChronizedREC** command is typically used to synchronize multiple DGy recorders so that they will perform as a multi-channel recorder. Before using the DGy in this mode it is recommended that the real-time clocks of each recorder be synchronized using either an IRIG or NTS time reference (synchronizing is then automatic). The **SYNChronizedREC** command should then be issued to each machine using the same time argument.
RECord**F**rame**R**ate	<0 .. 100>	Sets the rate at which input frames are recorded. This command would most likely be used to save disk space by recording at a lower frame rate. For example, a 1280 x 1024 image can typically be recorded at 30 frames/second. A setting of 15 would record at half the rate, with double the available recording storage time. An argument of 0 always allows recording at the maximum rate which is calculated automatically by the DGy. **Note**: **RECordFrameRate** must be set to 0 for multicast streaming with interframe compression enabled. Default: 0
RECord**B**it**R**ate	<0.1 .. 8.0>	Sets the degree of compression i.e. quality level (Stated in bits/pixel). **RECordBitRate** effectively controls the trade-off of bit-rate versus quality. Without regard to recording frame rate, an argument of 0.1 reflects a 240:1 compression, with an argument of 8 reflecting a 3:1 compression. (Compression is measured relative to a 24-bit pixel) Quality levels are related to compression level, for example: RECordBitRate 0.7 is low quality (34:1) RECordBitRate 1.0 is medium quality (24:1) RECordBitRate 1.5 is high quality (16:1) Default: 1.0 (medium quality)

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Table 6-6 *DGy 201x* Play and Record Commands (Continued)

Command	Arguments	Description
RECord**LOOP**	<ON | OFF>	If **RECLOOP** is *ON*, recording will be continuous. Note that only the current clip is overwritten. Disk overwrite will begin when there is only 4 GB of remaining disk space. Overwrite begins with the oldest part of the clip. Default: OFF

PLAY	[-P] [playlist]	This command switches the unit to ***Play*** mode and plays a previously made recording.
		The **PLAY** command plays back the items in the optional playlist.The playlist may contain up to 5 clipnames. Clips in the playlist will be played in the order they appear in the playlist.
		Note: Playlist capability can only operate at normal playback speed.
		If a playlist is not entered, the most recently recorded clip in the current directory will be played.
		It the optional -P argument is supplied, the DGy will be queued for playing but will immediately enter the ***Play Pause*** mode. To start playback from Pause a **PLAY** command must be issued. This provides the ability to set up a play back and to instantly start playback and is particularly useful in controlling multiple DGy recorders.
		Example: Play the clips named clip1, clip7 and latest_clip using the ***PLAY PAUSE*** mode.
		`PLAY - P clip1 clip7 latest_clip`
		`PLAY`

SYNChronized**PLAY**	<clipname> <starttime>	The **SYNChronizedPLAY** command is used to schedule playback of a clip at a specified time. The start time must be specified using the time format yyyymmddhhmmss (24-hour time). **Example**: Start playback from the beginning of a clip named Rec227 at 8:15 pm, June 11th 2005. `syncrec Rec227 20050611201500` The **SYNChronizedPLAY** command is typically used to synchronize multiple DGy recorders so that they will perform as a multi-channel playback system. Before using the DGy in this mode it is recommended that the real-time clocks of each DGy be synchronized using either an IRIG or NTS time reference (synchronizing is then automatic). The **SYNChronizedPLAY** command should then be issued to each machine using the same time argument.
SYNChronized**STOP**	(none)	Cancels any queued synchronized command. See **SYNChronizedPLAY** and **SYNChronizedRECord**.

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Table 6-6 *DGy 201x* Play and Record Commands (Continued)

Command	Arguments	Description
PLAYLOOP	<ON | OFF>	This command modifies the behavior of **PLAY**. If **PLAYLOOP** is **OFF** then **PLAY** plays its clip (or list of clips) once, then stops. If **PLAYLOOP** is **ON**, **PLAY** plays the listed clip(s) in a loop until **STOP** is issued. Default: OFF
SYNChronized**STAT**us	(none)	Lists information about any queued synchronized command. See **SYNChronizedPLAY** and **SYNChronizedRECord**.

PLAYSPee**D**	[-100.0 ... 100.0]	This command sets the *DGy 201x* play speed.
		PLAYSPeeD = 1.0 represents normal speed in the forward direction.
		Positive **PLAYSPeeD** values represent playback in the forward direction.
		To play in fast forward use a positive value of **PLAYSPeeD** greater than 1.0.
		To play in slow motion, use a positive value between 1.0 and 0.0.
		Negative **PLAYSPeeD** values represent playback in reverse.
		To play in fast reverse use a negative value greater than -1.0
		To play in slow reverse use a negative value between -1.0. and 0.0.
		Example: Set the play speed for 8 times normal in the reverse direction.
		`PLAYSPD -8.0`
		Example: Set the play speed for 1/10 normal speed in the forward direction.
		`PLAYSPD 0.1`
		Default: 1.0

PAUSE	(none)	In ***Play*** mode, this command pauses playback. Playback resumes when the **Play** command is sent. In ***Record*** mode, this command pauses record. Record resumes when the **Record** command is sent.
Next**CLIP**	(none)	Cues the DGy from the currently playing clip to the beginning of the next recorded clip. Works in ***Play*** or ***Pause*** modes.
Prev**CLIP**	(none)	Moves the DGy from the currently playing clip to the beginning of the previously recorded clip, then cues. Works in ***Play*** or ***Pause*** modes.

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Table 6-6 *DGy 201x* Play and Record Commands (Continued)

Command	Arguments	Description
Frame**N**ext	(none)	Advances to the next frame of a paused clip. Operates in ***Pause*** mode only.
Frame**P**revious	(none)	Steps back to the pervious frame of a paused clip. Operates in ***Pause*** mode only.
STOP	(none)	This command cancels the **Play**, **Pause**, and **Record** recorder functions.
Delete**MARK**	<marknumber | markname | -ALL>	The **DMARK** command deletes the given event mark if the event mark is within the clip currently being played (or paused). With the argument "-ALL," **DeleteMark** deletes all event marks within the current clip. Without an argument, this command deletes the currently selected event mark (if the DGy is paused on an event mark).
Edit**MARK**	<marknumber | markname> <newmarkname>	The **EMARK** command names (or renames) the specified event mark, if the event mark is in the clip currently being played or paused. Initially each event mark is assigned a number. The **EditMARK** command may be used to associate a descriptive name with that number. MarkNames must have at least one alpha character and must contain no white space. The markName ALL is illegal.
List**EV**ery**MARK**	(none)	The **LEVMARK** command lists the timecode and description of all event marks in all clips on all disks. Retrieval time will be dependent upon the total number of event marks.
List**MARK**	<marknumber | markname | -ALL>	The **LMARK** command displays the timecode and description of the mark number specified, if the mark is in the clip currently being played or paused. The optional "-ALL" argument provides a list of all marks. **Example**: List all marks of the current clip (player currently paused on the clip). `lmark -all`
MARK	(none)	Event marks can be made during record or playback. If a **MARK** is issued during record the event mark is created using the current record time. If a MARK is issued during playback the event mark is created using the time stamp of the original recording.

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Table 6-6 *DGy 201x* Play and Record Commands (Continued)

Command	Arguments	Description
NEXTMARK	(none)	The **NEXTMARK** command sends the *DGy 201x* to the next event mark from the current position, and cues there. To play from that spot, issue a **PLAY** command. This command is valid only in ***Play*** and ***Play/Pause*** modes. **NEXTMARK** will only seek within the current clip, and will not wrap.
PREVMARK	(none)	The **PREVMARK** command sends the recorder to the previous event mark from the current position, and cues there. To play from that spot you must issue a **PLAY** or **PAUSE** command. This command is valid only in ***Play*** and ***Play/Pause*** modes. **PREVMARK** will only seek within the current clip, and will not wrap.
Seek**T**o**MARK**	<marknumber | markname>	The **STMARK** command sends the recorder to the specified event mark, and cues there. To play from that spot you must issue a **PLAY** command. **STMARK** will only seek within the current clip.
Time**C**ode**Q**uery	[H | F]	Returns the timecode at the current disk position. Only valid in ***PLAY*** or ***PAUSE*** modes. When used without an argument, the TimeCodeQuery command returns the time in the format yyyymmddhhmmss. When used with the optional H argument, the TimeCodeQuery returns the replay timecode with resolution in milliseconds with the format yyyymmddhhmmssxxx where the final three digits (xxx) represent the fractional time in milliseconds. When used with the optional F argument, the TimeCodeQuery command returns the replay timecode using the frame number. The first frame in a file is identified as frame 0. Note that a clip may consist of multiple files and that the maximum file size is approximately 512 MB. This command option is typically used for debug only.

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STREAMING COMMANDS

The table below lists *DGy 201x* streaming commands.

Table 6-7 Streaming Commands

Command	Arguments	Description
Stream**F**ragment**STAT**us	(none)	Returns the current state of multicast streaming by displaying either ON or OFF for both the **STREAMIN** and **STREAMOUT** functions.
STREAMIN	(none)	Initiates the incoming multicast stream to be received, decoded, and viewed on the client *DGy 201x* decoder. To begin subscribing to a multicast stream, first set the **STREAMINADDR** and **STREAMINPORT**.
STREAMINADDR	[ddd.ddd.ddd.ddd]	Sets or displays the incoming multicast stream IP address. To determine the current multicast stream IP address without changing it, use the command without an argument. Default: 225.0.0.37
STREAMINPORT	<5001...65535>	Sets or displays the incoming multicast stream transmission port. To determine the current port without changing it, use the command without an argument. Default: 6000
STREAMINSTOP	(none)	Stops the incoming multicast stream.
STREAMOUT	(none)	Initiates the outgoing multicast stream transmission from the server *DGy 201x*.
STREAMOUTADDR	[ddd.ddd.ddd.ddd]	Sets or displays the outgoing multicast stream IP address. To determine the current IP address without changing it, use the command without an argument. Default: 225.0.0.37
STREAMOUTPORT	<5001...65535>	Sets or displays the outgoing multicast stream transmission port. To determine the current port without changing it, use the command without an argument. Default port setting: 6000
STREAMOUTSTOP	(none)	Stops the outgoing multicast stream transmission.
RECord**F**rame**R**ate	<0 .. 100>	When streaming, this must be set to 0 to allow the DGy to automatically calculate the maximum rate. Default: 0

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Table 6-7 Streaming Commands (Continued)

Command	Arguments	Description
COMPression**INT**er**FR**a**M**e	[ON | OFF]	Turns interframe compression on or off for multicast streaming. Default: Off
COMPression**INT**er**FR**a **M**e**LEN**gth	1 to 4095	This is the maximum number of frames before a new anchor frame is transmitted. See **Interframe Compression** on page 45 for details. Default is 30.
COMPression**SEN**sitivity	<0...255>	This value determines the amount of motion required to trigger interframe compression. Lower values provide greater sensitivity; higher values provide higher compression. A setting of 0 will result in no interframe compression. Default: 4
COMPression**THR**eshold	<0...255>	Sets the amount of variance per pixel to qualify as a change for interframe compression. Typically, only the default value is used. Default: 16

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CLIP AND DISK COMMANDS

Individual recordings are known as clips. Clip and disk management commands are described in this section.

Table 6-8 Clip and Disk Commands

Command	Argument	Description
BUZZer**FUNC**tion	<OFF | FULL | [1..100]>	Sets when the buzzer will sound and the front panel LED indicators will flash. *FULL* causes the buzzer to sound when there is no disk space left. The numeric argument causes the buzzer to sound when that percentage of the disk space has been used. For example, with **BUZZFUNC** set to 95, the buzzer will sound (and the front panel disk-full lights will blink) when there is about 12 GB of a 238 GB drive available. **Notes**: The buzzer never sounds if **RECordLOOP** is ON. If **BUZZFUNC** is OFF the buzzer doesn't sound. Default: 95
BUZZer**R**e**S**e**T**	(none)	Turns the buzzer off. **Note**: Using this command does not change the settings of **BUZZerFUNCtion**.
Co**P**y**CLIP**	<clipname1> <clipname2>	Creates *clipname2* as an identical copy of *clipname1*. Relative or absolute pathnames are allowed.
Current**CLIP**	(none)	Gives the name of the clip currently being played.
DELete**CLIP**	[-R] <clipname>	Deletes named clip. *Clipname* can contain Unix style wild cards, and may be used to specify multiple clips. **DELCLIP *** deletes all clips in the directory. The -R flag indicates that **DELCLIP** should recurse through subdirectories in an attempt to find clips to delete.

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Table 6-8 Clip and Disk Commands (Continued)

Command	Argument	Description
LiStCLIPs	[-R] [-L] [-F] [-P] [clipname]	With no argument, **LiStCLIP** displays a listing of all recorded clips in the current directory. For each clip, the real time, elapsed time, and recording length are listed. Clips are listed chronologically with the earliest clip at the beginning of the list. *Clipname* can contain Unix style wild cards, and is used to qualify the search (not valid for the **-P** flag described below). The following optional command flags are supported: **-F** Identifies directories by displaying a trailing / **-L** Provides additional clip information including: record frame rate, quality mode, quality level and protection status. **-R** Provides a recursive listing of clips. **-P** Provides a list of the individual files that make up the current clip. **Example**: Show a listing of the file “jnew“ displaying details about frame rate and quality level. Type: `lsclip -L jnew`
REName**CLIP**	<clipname1> <clipname2>	Renames *clipname1* to *clipname2*. Relative or absolute pathnames are allowed. Only renames to the same disk. An attempt to rename a clip to a location on the other disk will return an error.
PROTECTCLIP	<clipname>	Write protects named clip. *Clipname* can contain Unix style wild cards, and may be used to specify multiple clips. **Note**: Event marks cannot be placed into a protected clip.
UNPROTECTCLIP	<clipname>	Removes write protection from named clip. *Clipname* can contain Unix style wild cards, and may be used to specify multiple clips.
Real**T**ime**S**eek	<yyyymmddhhmmss[xxx]>	The **RealTimeSeek** command cues the DGy to the specified real time recording time within the current clip. The time argument can be provided with resolution in seconds, or in milliseconds by adding the final three digits (xxx) at the end of the **RealTimeSeek** argument.

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Table 6-8 Clip and Disk Commands (Continued)

Command	Argument	Description
Time**C**ode**Q**uery	[F | H]	The **TCQ** command returns the timecode of the current clip position. This command is valid in ***Play*** or ***Play Pause*** modes only. When used with the **F** argument, the **TCQ** command returns the relative frame number. When used with the **H** argument the **TCQ** command returns the time code with resolution in milliseconds.
CD	<dirname>	Changes to a new directory on the current drive. Relative or absolute pathnames are allowed. The path name to the removable disk is /remov/. The path name to the (optional) fixed disk is /fixed/. Use the **PWD** command to report your current directory and drive. **Example**: If you are currently using the fixed drive and wish to change to the directory “myclips” on the removable drive use the following command: `cd /remov/myclips`
DELete**DIR**	<dirname>	Removes the named (empty) directory. Relative or absolute pathnames are allowed.
MKDIR	<dirname>	Makes a new directory. Relative or absolute pathnames are allowed. **Example**: Create the directory “myclips”: `mkdir myclips`
PWD	(none)	Gives the absolute path of the current directory.
ERASEFIXEDDISK	(none)	This command erases the entire contents of the optional fixed disk drive. This is an interactive command that will prompt for confirmation that you wish to proceed. The process may take several minutes, and the DGy will automatically reboot as soon as the procedure is complete. Note that only recorded data is stored on the disk. The DGy application software (firmware) is not stored on disk. **WARNING:** This command does not have an undo feature.

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Table 6-8 Clip and Disk Commands (Continued)

Command	Argument	Description
ERASEREMOVABLEDISK	(none)	This command erases the entire contents of the removable disk drive. This is an interactive command that will prompt for confirmation that you wish to proceed. The process may take several minutes, and the DGy will automatically reboot as soon as the procedure is complete. Only recorded data is stored on the disk. The DGy application software is not stored on disk. **WARNING:** This command does not have an undo feature.
MOUNT	<ipaddress:sharename>	This *DGy 201x* optional feature supports the ability to mount an external network mapped disk drive for recording and replaying clips. Note that this capability requires the use of Linux or an Allegro network file server software for the Windows OS. The **MOUNT** command provides the ability to set up a network mapped NFS remote disk drive that the DGy can use to store and recall recordings. The location of the remote drive is identified by the network address (*ipaddress*) and *sharename* is the name of the shared drive as configured in the NFS server on the remote host; the syntax of this name may vary with different NFS servers. It is recommended that the IT manager consulted before executing the mounting procedure. **Example**: To mount the /usr/dgy NFS share on a Linux host at IP node 192.168.1.123, issue the following: `mount 192.168.1.123:/usr/dgy` Once the disk is mounted the drive will be identified in the Clip Browser as \remot. To record, play or list clips on the remote drive execute the command *CD/rgb/mp1* followed by the desired clip command (**PLAY***,* **RECORD** ...). The settings associated with the remote drive are saved in non-volatile memory, and the DGy will automatically attempt to reconnect after a reboot. To select a new remote drive you must first unmount the current drive (see the **UMOUNT** command for details). **Note**: After mounting a drive verify that the drive is mounted can be accomplished using the **VOLINFO** command (see **VOLumeINFO** for details).

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Table 6-8 Clip and Disk Commands (Continued)

Command	Argument	Description
UMOUNT	(none)	The **UMOUNT** command will unmount the current remote drive if this option is installed. **Note**: An alternate drive or volume must be mounted before executing the **UNMOUNT** command. See also **MOUNT**
VOLume**INFO**	[-f | -n]	Displays disk storage parameters: total disk record time, used disk time, remaining disk record time, and disk volume name. If no argument is supplied **VOLINFO** responds with the information for the removable drive. Use the -f flag argument to display parameters for the fixed drive. Use the -n flag argument to display the parameters for the remote (NFS) drive.
VOLume**NAME**	[name] [-f]	**VOLNAME** can be used to read or write the DGy disk volume name. The name can be up to 30 characters in length and may include spaces and punctuation characters. If no name is specified, **VOLNAME** prints the current name of the disk. If the *-f* flag is not specified, **VOLNAME** relates to the removable disk. Use the *-f* flag to display parameters for the fixed drive.

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TIME COMMANDS

The *DGy 201x* recorder uses an internal real time clock to time stamp recordings. This clock can be set manually or can be synchronized automatically on a periodic basis to an external time reference. *DGy 201x* supports the use of a Network Time Server (using the NTP protocol) or as an option may be connected to an IRIG-B time standard.

Table 6-9 Time Commands

Command	Arguments	Description
Current**TIME**	[RAW]	Displays currently computed local time of DGy internal clock with the date in mm/dd/yyyy format and time displayed in hh:mm:ss format. The time displayed is the current local time. If the time zone is changed the local time will also be changed. To display the time as an unformatted data string use the optional RAW argument. For example if the current date and time are 3/02/2005 8:01:23, then using the RAW argument DGy will respond with the string 2005302080123.
Real**T**ime**C**lock**SET**	<yyyymmddhhmmss>	Sets the internal DGy real time clock. This should only be used if no other method of timesetting is available.
Time**Z**one	<-12 ... +12>	Sets the timezone relative to UTC, For example Pacific Standard Time (PSRT) is -8 (8 hours behind UTC). DGy must be rebooted before the new time zone takes effect.
IRIGMaster	<ON | OFF>	Configures the IRIG output circuitry. When ON, an IRIG-B timecodes in the DCLS format will be generated on the output based on the current time on the DGy. When OFF, the output will be a loop of the input.
IRIGSTandar**D**	[DCLS | MOD1K]	The **IRIGSTD** command is used to set the optional IRIG-B (format B123) input to accept either a DCLS (DC Level shift) or MOD1K (modulated 1kHz) reference signal. Default: DCLS
NTSIP	[Network Time Server IP address]	Sets the IP address of a Network Time Server. Up to three IP addresses can be set. See also the commands: **RealTimeClockSYNC** and **RealTimeClockSYNCPERiod**

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Table 6-9 Time Commands (Continued)

Command	Arguments	Description
Real**T**ime**C**lock**SYNC**	<OFF | IRIG | NetworkTimeServer>	The internal DGy real time clock can be automatically synchronized to an external network time server. When the **RTCSYNC** is set to OFF, the DGy internal clock is not synchronized to an external time reference (IRIG or NTS). When the **RTCSYNC** is set to *NetworkTimeServer* the DGy will automatically synchronize its internal clock to the network time server first specified by the NTSIP command. Note that when using the NTSIP to display your local time correctly, you must set the Time Zone to correspond with your geographical location. **Note:** DGy requires a full time Internet connection to provide this capability. See also: **NTSIP** and **TimeZone**. When the **RTCSYNC** is set to *IRIG*, the DGy will automatically synchronize it's internal clock to the external (optional) IRIG time reference connected to the IRIG input (see also **IRIGSTandarD**). Default: OFF
Real**T**ime**C**lock**SYNCPER**iod	[30 ... 1440]	Sets the update interval period for the NTS or (optional) IRIG reference time servers. The period is set in minutes, 30 to 1440 minutes in 30 minute intervals. Default: 120

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MISCELLANEOUS COMMANDS

The table below lists all *DGy 201x* miscellaneous commands, their arguments and detailed descriptions.

Table 6-10 Miscellaneous Commands

Command	Arguments	Description
Help	[<command>]	**Help**, without an argument will display the entire serial command set. **Help**, with a command as an argument will display detailed information about that command.
ID	(none)	Displays the following DGy information: • Product type • Date of manufacture • Serial number • Firmware version number • Input type
VERsion	(none)	Displays the following DGy information: • Firmware version • FPGA version number, • Web Control Panel (WCP) version number.
BAUDrate	<9600 | 19200 | 38400 | 57600 | 115200>	Sets the serial port baud rate. Operation of the serial port at the highest possible speed is recommended. Default: 115,200
ECHO	<ON | OFF>	Turns the serial echo On/Off. The echo is only on commands typed and sent to the unit. **Note**: The Echo setting has no effect on responses issued by the DGy; responses are always visible, regardless of the Echo status. Default: ON
HANDShaking	<HardWare | SoftWare>	Sets the type of flow control on the serial port. The HardWare handshaking uses CTS/RTS control. The SoftWare handshaking protocol is XON-XOFF. Default: SoftWare
HOSTNAME	<hostname>	Sets Ethernet hostname. Default: DGy

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Table 6-10 Miscellaneous Commands (Continued)

Command	Arguments	Description
IPADDRess	[ddd.ddd.ddd.ddd]	Without an argument, this command reports the DGy current IP address. To change the DGy IP address, enter the command followed by an argument. **Example**: To set the IP address to 192.168.35.101, type `IPADDR 192.168.35.101` and press **Enter** Use the **SYStemReSet** command to reboot the unit to activate the new IP address. Default 192.168.1.200
IPSub**NET**	[ddd.ddd.ddd.ddd]	Without an argument, this command reports the DGy current IP subnet mask. To change the IP subnet enter the command followed by argument. **Example**: To set the IP subnet mask to 255.255.255.1, type `IPSNET 255.255.255.1` and press **Enter** Use the **SYStemReSet** command to reboot the unit to activate the new IP subnet mask. Default: 255.255.255.000
IPGate**W**ay	[ddd.ddd.ddd.ddd]	Without an argument, this command reports the DGy current IP gateway address. To change the gateway address, enter the command followed by an argument. **Example**: To set the gateway address to 192.168.35.1, type `IPGW 192.168.35.1` and press **Enter** Use the **SYStemReSet** command to reboot the unit to activate the new IP gateway.
MACADDRess	(none)	Reports the physical Ethernet (Media Access Controller) address.
Restore**F**actory**D**efaults	(none)	Restores all user settings to their factory default values.
SYStem**R**e**S**et	(none)	Causes the DGy to reboot. This command allows the system firmware to be restarted without having to use the front panel power switch.
SHUTDOWN	(none)	Remotely shuts down the DGy. **Important**: Do not remove the power cord from the DGy until one to two minutes after issuing the command. During shutdown, the power indicator on the front panel will remain on, but the DGy is inoperable. Failure to wait for the normal shutdown procedure to execute may cause loss of data.

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Table 6-10 Miscellaneous Commands (Continued)

Command	Arguments	Description
Test**P**attern	<CBAR | BOX | RAMP | PRBS | GRATE | OFF>	This command selects which internal test pattern is displayed or turns the test pattern generator off. It can be used to confirm that the output connections are working correctly. Test patterns include: CBAR - 100% color bars BOX - a box indicating the extent of the output image RAMP - a horizontal luminance ramp PRBS - a test sequence for the DVI output GRATE - an fs/2 vertical grate Default: OFF
Update**F**irm**W**are	(none)	This command updates the firmware for the DGy.The firmware file must be transferred to the *DGy 201x* using FTP prior to using this command. See Appendix C, **Firmware Upgrade** on page 139 for more details.

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FACTORY TIMING LIST

The table below lists all of *DGy 201x*'s preset timings that can be used for **Output** or **Input** timing settings. User-defined settings can also be added to this list. These settings are used to match the system's output to that of the display device or can be used to manually define input timing.

Columns are provided for the timing ID, plus all of the individual parameters such as frequency, sync, polarity, interlace and many more.

Please note:

- Entries 1 - 44 are factory defined timing parameters.
- Entries 45 - 99 are reserved for future pre-defined parameters.
- Entries 100 - 160 are for user-defined timings.
- Because all parameters can be modified with the **OutPutTiMing** and **INputTiMing** commands, advanced users can "tweak" settings and then store them using the **OutPutTiMingSAVE** or **INputSAVE** command.
- Custom settings can also be named using the **OutPutTiMingNAME** and **INputNAME** commands.
- If desired, print this list and keep a record of any user-defined settings.

Table 6-11 Factory Timing 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 @ 43 Hz	8	176	56	1024	35.601	0	4	20	768	5	1	1	1
14	VESA 1024 x 768 @ 60Hz	24	136	160	1024	48.363	3	6	29	768	5	0	0	0
15	VESA 1024 x 768 @ 70Hz	24	136	144	1024	56.476	3	6	29	768	5	0	0	0
16	VESA 1024 x 768 @ 75Hz	16	96	176	1024	60.023	1	3	28	768	5	1	1	0
17	VESA 1024 x 768 @ 85Hz	48	96	208	1024	68.677	1	3	36	768	5	1	1	0
18	VESA 1152 x 864 @ 75Hz	64	128	256	1152	67.500	1	3	32	864	5	1	1	0

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Table 6-11 Factory Timing List (Continued)

ID	TYPE	HFP	HS	HBP	HACT	HFRQ	VFP	VS	VBP	VACT	SYNC	HPOL	VPOL	IL
19	VESA 1280 x 960 @ 60Hz	96	112	312	1280	60.000	1	3	36	960	5	1	1	0
20	VESA 1280 x 960 @ 85Hz	64	160	224	1280	85.938	1	3	47	960	5	1	1	0
21	VESA 1280 x 1024 @ 60Hz	48	112	248	1280	63.981	1	3	38	1024	5	1	1	0
22	VESA 1280 x 1024 @ 75Hz	16	144	248	1280	79.976	1	3	38	1024	5	1	1	0
23	VESA 1600 x 1200 @ 60Hz	64	192	304	1600	75.000	1	3	46	1200	5	1	1	0
24	EIA-343-A 675 lines	16	56	64	832	20.253	2.5	2.5	20	312	4	1	1	1
25	EIA-343-A 729 lines	20	64	80	900	21.870	2.5	2.5	22	337	4	1	1	1
26	EIA-343-A 875 lines	26	96	118	1080	26.245	3	3	27	404	4	1	1	1
27	EIA-343-A 945 lines	36	112	140	1164	28.343	3	3	29	437	4	1	1	1
28	EIA-343-A 1023 lines	44	136	164	1260	30.692	4	4	30	473	4	1	1	1
29	720 x 480, 29.97i	16	61	61	720	15.734	3	3	14	242	3	0	0	1
30	720 x 576, 25i	12	66	66	720	15.625	2.5	2.5	20	287	3	0	0	1
31	960 x 480, 29.97i	23	69	92	960	15.734	3	3	14	242	3	0	0	1
32	960 x 576, 25i	23	69	100	960	15.625	2.5	2.5	20	287	3	0	0	1
33	1280 x 720, 24	70	40	260	1280	18.000	5	5	20	720	3	0	0	0
34	1280 x 720, 30	70	40	260	1280	22.500	5	5	20	720	3	0	0	0
35	1280 x 720, 60	70	40	260	1280	45.000	5	5	20	720	3	0	0	0
36	1920 x 1080, 24i	594	44	192	1920	27.000	2	5	15.5	540	3	0	0	1
37	1920 x 1080, 24p	594	44	192	1920	27.000	4	5	36	1080	3	0	0	0
38	1920 x 1080, 30i	44	44	192	1920	33.750	2	5	15.5	540	3	0	0	1
39	1920 x 1080, 30p	44	44	192	1920	33.750	4	5	36	1080	3	0	0	0
40	1920 x 1080, 60p	44	44	192	1920	67.500	4	5	36	1080	3	0	0	0
41	1920 x 1035, 30i	44	44	192	1920	33.750	5	5	35.5	517	3	0	0	1
42	1365 x 768, 60p	51	50	60	1365	47.280	4	4	12	768	5	1	1	0
43	1360 x 768, 60p	64	176	192	1360	47.712	3	6	18	768	5	1	1	0
44	1920 x 1200, 60p	48	32	80	1920	74.038	3	6	26	1200	5	1	0	0

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TECHNICAL SPECIFICATIONS

IN THIS APPENDIX

This appendix provides functional and performance specifications for the *DGy 201x* and in addition a description of connector and pin out information.

GENERAL SPECIFICATIONS

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

- **High Resolution Analog Input**
- **Digital Input Specifications**
- **Graphic Output Specifications**
- **Storage Capacity**
- **Control Specifications**
- **IRIG Time Code**
- **Power and Physical Specifications**

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HIGH RESOLUTION ANALOG INPUT

The following tables indicate the *DGy 201x* input capability.

Table A-1 Analog Graphics Input Characteristics

Parameter	Specification
Scanning	Interlaced or non-interlaced
Number of inputs	1
Signal formats	RGB - **Note**: RGB inputs operate in single-channel mode only.
Signal level	Nominal 0.7 V peak-to-peak
Input impedance	75 ohms, nominal
Sample rate	Up to 170 MHz
Resolution	640 x 480 to 1600 x 1200
Sync	3-wire (sync on green) 4-wire (separate composite sync) 5-wire (separate H & V sync)
Sync Level	0.3 V peak-to-peak (3-wire) 1 to 5 V (4 and 5-wire)

DIGITAL INPUT SPECIFICATIONS

The table below lists the high resolution digital input specifications.

Table A-2 Digital Input Specifications

Parameter	Specification
Type	DVI - single link
Number of inputs	1
Maximum bandwidth	165 MHz
Resolution	640 x 480 to 1600 x 1200
Connector type	DVI-I integrated digital/analog connector (see **DVI-I Connector**).

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GRAPHIC OUTPUT SPECIFICATIONS

The tables below list the high resolution analog and digital output specifications.

Table A-3 Analog Output Specifications

Parameter	Specification
Number of outputs	1
Output level	Nominal 0.7V. peak-to-peak (excluding sync)
Output impedance	75 ohms, nominal
Sample rate	Up to 240 MHz
Resolution	Up to 1600 x 1200, progressive scan
Sync type	Available sync types: • 3-wire (sync on green), • 4-wire (separate composite sync) • 5-wire (separate H and V sync)
Sync level	0.3 V peak-to-peak (3-wire), 5 V maximum (4 and 5-wire)

Table A-4 Digital Output Specifications

Parameter	Specification
Number of outputs	1
Type	1 DVI single-link
Max bandwidth	Up to 165 MHz
Connector type	DVI-I Integrated digital/analog connector (see **DVI-I Connector**)

STORAGE CAPACITY

The table below lists the storage capacity for the internal drives.

Table A-5 Storage Capacity

Parameter	Specification
Removable Disk	238 GB IDE
Optional Fixed Disk	238 GB IDE
Optional Removable Disk	476 GB IDE

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How much time does this storage capacity provide? The amount of material recorded on the drive is related to the following variables:

- Image resolution
- Frame rate
- Compression level (quality level)

Examples of record times for a signal with various frame rates and quality levels are shown in the table below:

Table A-6 *DGy 201x* Record Time - 238 GB Disk

Resolution	Quality Setting (Compression Ratio)		
	High (16:1)	Mid (24:1)	Low (34:1)
1280 x 1024 @ 5 fps	53.8 hrs.	80.7hrs.	114.3hrs.
1280 x 1024 @ 10 fps	26.9 hrs.	40.4 hrs.	57.2 hrs.
1280 x 1024 @ 20 fps	13.5 hrs.	20.2 hrs.	28.6 hrs.
1280 x 1024 @ 30 fps	9 hrs.	13.5 hrs.	19.1 hrs.
1600x 1200 @ 5 fps		55.1 hrs.	78.0 hrs.
1600x 1200 @ 10 fps		27.5 hrs.	39.0 hrs.
1600x 1200 @ 20 fps		13.9 hrs.	19.5 hrs.

Note Double these record times when using an optional 476 GB removable disk drive.

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CONTROL SPECIFICATIONS

The table below lists *DGy 201x* control specifications:

Table A-7 Control Specifications

Parameter	Specification
Control Protocol	*DGy 201x* control is accomplished by use of the *DGy 201x* ASCII based command set. This command set may be used with the serial and Ethernet control ports listed below. (see the **Commands** section in Chapter 6 for details).
Ethernet	100/1000 Base-T Ethernet port. • Supports control of the full set of *DGy 201x* commands over a network connection using a Telnet server/client architecture. • Internal *DGy 201x* web server provides the Web Control Panel (WCP) a graphical user interface used with a standard web browser. • The *DGy 201x* Ethernet port connector is a standard RJ45 modular connector (see the **Ethernet Connector** on page 128).
RS-232 Port	*DGy 201x* 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 (default), 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 *DGy 201x* RS-232 port connector type is a 9-pin, sub miniature D connector (see the **RS-232 Connector** section on page 120 for details).

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IRIG TIME CODE

The table below lists specifications for the optional IRIG-B timecode interface. The interface is designed in accordance with the requirements of the Range Commanders Council (RCC) document 200-04 (Defense Technical Information Center).

Table A-8 IRIG Timecode Specification

Parameter	Specification
IRIG Type	IRIG-B (time frame of 1 sec, BCD time of year, SBS)
Format	B123
Interface	DCLS (dc level shift code) 1 kHz amplitude modulated.
Signal Level	2 -3 V peak-to-peak (10 V maximum)
Connector Type	BNC female (looping input, bridging impedance)

POWER AND PHYSICAL SPECIFICATIONS

The table below lists *DGy 201x* power and physical specifications:

Table A-9 Power and Physical Specifications

Parameter	Specification
Input Voltage	100-240 VAC
Frequency	50Hz - 60 Hz
Power Consumption	65 VA
Power Factor Correction	Compliant with EN 61000-3-2
Size	17.25"W (excluding rack mount ears) x 19.0"D x 1.75"H
Rack Mount Kit	Included
Weight	16 pounds (7.3 kg)

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CONNECTORS AND PINOUTS

This section provides information about the signal and control connectors used in *DGy 201x*.

- **DVI-I Connector**
- **Ethernet Connector**
- **Ethernet Connector**
- **RS-232 Connector**

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 *DGy 201x* 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 *DGy 201x* DVI input and output signals.

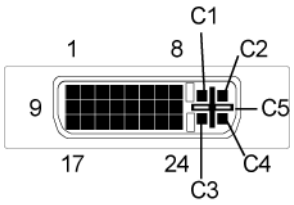


Figure A-1 DVI-I Digital/Analog Connector

The 29-pin DVI-I connector (Molex #74320) has the following pin assignments:

Table A-10 DVI-I Connector Pinout

Pin	Signal
1	TMDS Data 2-
2	TMDS Data 2+
3	TMDS Data 2/4 shield
4	NC
5	NC
6	DDC Clock
7	DDC Data

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Table A-10 DVI-I Connector Pinout (Continued)

Pin	Signal
8	Analog Vertical Sync
9	TMDS Data 1-
10	TMDS Data 1+
11	TMDS Data 1/3 shield
12	NC
13	NC
14	+5V Power
15	Ground
16	Hot Plug Detect
17	TMDS Data 0-
18	TMDS Data 0+
19	TMDS Data 0/5 shield
20	NC
21	NC
22	TMDS Clock shield
23	TMDS Clock+
24	TMDS Clock-
C1	Analog Red
C2	Analog Green
C3	Analog Blue
C4	Analog H sync
C5	Analog Ground

INPUT CABLES

Digital inputs can be connected to the *DGy 201x* directly using DVI cables. Analog RGB signals can be connected using DVI to 15-pin sub miniature D adapters that are provided as a standard accessory with *DGy 201x* units.

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OUTPUT CABLES

Both the digital and analog outputs of the *DGy 201x* are provided on the graphics output connector. Purpose built cables are available commercially to provide connections for digital interfaces or analog interfaces. The *DGy 201x* is provided with DVI 15-pin adapters 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.

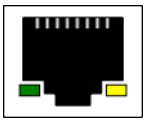


Figure A-2 Ethernet Connector

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

Table A-11 Ethernet Connector Pinouts (EIA/TIA 568B)

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 *DGy 201x* directly to the network — typically using an Ethernet hub or switch. To connect directly from a PC to the *DGy 201x*, a crossover cable must be used (see the following section for details).

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CROSSOVER CABLES

To connect directly from a PC (such as a laptop) to the *DGy 201x* without connecting to the network, an Ethernet crossover cable must be used. Crossover cables are available commercially.

In a crossover cable, one end of the cable is wired as a straight through cable, using the pin assignments shown in **Table A-11**. 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 A-11**. 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 *DGy 201x* can be explicitly controlled with ASCII Command Set instructions sent via the RS-232 serial port from either a computer or an ASCII terminal. Refer to **Chapter 6**, 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.

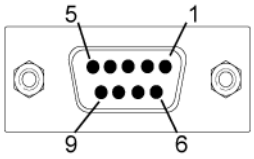


Figure A-3 RS-232 Female Connector

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

Table A-12 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)

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Table A-12 RS-232 Serial Connector Pinouts (Continued)

Pin	Circuit	Description
6	DSR	Data Set Ready
7	CTS	Clear to Send
8	RTS	Request to Send
9		(not connected)

NULL MODEM

Connecting the *DGy 201x*'s serial port to a computer configured as Data Communications Equipment (DCE) 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.

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B

COMMUNICATIONS SETUP

IN THIS APPENDIX

This appendix provides specific communications setup procedures that are referenced in Chapter 2, **Installation and Set Up**. The following topics are discussed:

- **Serial Communications**
- **Ethernet Control**

SERIAL COMMUNICATIONS

LAUNCHING A HYPERTERMINAL WINDOW

A command line interface is provided for *DGy 201x* using the serial port. A full description of available commands is provided in **Command Line Interface** on page 85.

PCs running the Windows Operating system are provided with serial emulation software known as Hyperterminal. This provides a convenient method to communicate with the *DGy 201x*.

Use the following steps to launch a Hyperterminal window on a PC:

1. On the PC, click **Start > Programs > Accessories > Communications > Hyperterminal**.

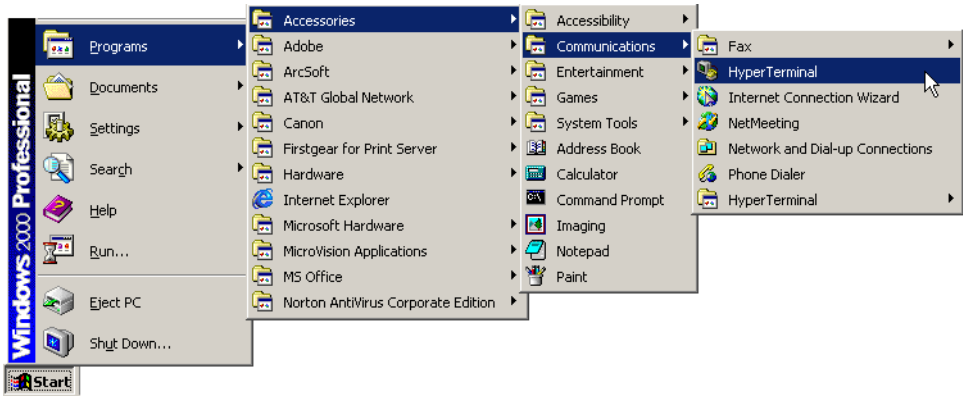


Figure B-1 Hyperterminal Path

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This action displays the **Connection Description Dialog**, an example is shown below.

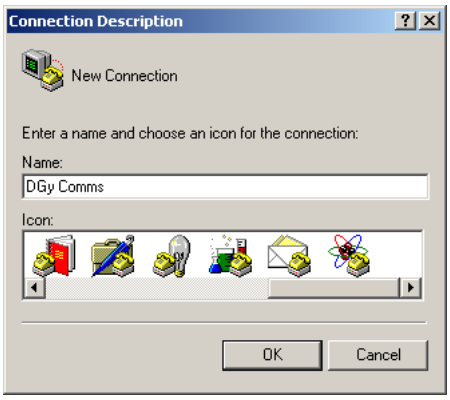


Figure B-2 Connection Description Dialog Example

2. In the dialog:
   - ~ Enter a name
   - ~ Choose an icon
   - ~ Click **OK** to display the **Connect To Dialog**.



Figure B-3 Connect To Dialog Box

3. In the **Connect To** dialog, ignore the **Country**, **Area Code** and **Phone Number** fields. In the **Connect Using** field, select the PC's COM port to which the serial cable from *DGy 201x* is connected.
4. Click **OK** to display the **COM Properties** dialog.

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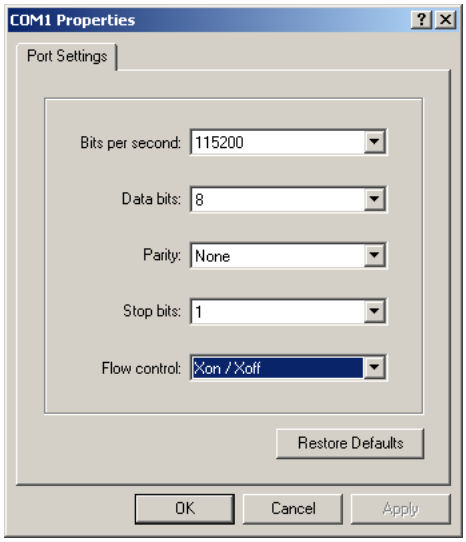


Figure B-4 COM Properties Dialog Box

5. Configure the PC to match *DGy 201x*'s pre-configured factory settings, as follows:
   - Bits per second (baud): **115,200** (default)
   - Data bits: **8**
   - Parity: **None**
   - Stop bits: **1**
   - Flow control: **XOn / XOff**

   The *DGy 201x* can be configured to operate at baud rates from 9600 baud to 115 kbaud. The recommended baud rate is 115 kbaud (default baud rate). In Chapter 6, refer to the **Commands** on page 88 for details about changing baud rates.
6. Click **OK** to display the Hyperterminal window.
7. In Chapter 2, please continue with the **Installation** on page 17.

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ETHERNET CONTROL

The *DGy 201x* can be controlled from the 100/1000 Base-T Ethernet port using a command line interface (Telnet) or an embedded GUI (Web Control Panel) via a standard web browser. The same set up procedure is used for either type of control. The *DGy 201x* can be connected to a standard LAN or directly as a peer-to-peer connection. Network settings must be set prior to using it in either configuration.

The following topics are discussed in this section:

- **Introduction to IP Addresses**
- **IP Address Setup via Serial Port**
- **IP Address Setup via Ethernet**

INTRODUCTION TO IP ADDRESSES

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**) is required.

For proper operation, *DGy 201x* requires a fixed IP address (also known as a *static* IP address). At the factory, *DGy 201x* is programmed with a default IP address (**192.168.1.200**), but this address must be changed if the *DGy 201x* will be used on a network.

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

▲ **Recommendation**: To use a *DGy 201x* on a Local Area Network (LAN), change the unit's IP address before putting it on the network. This can be accomplished in one of two ways:

~ Use the serial port to change the unit's IP address. Refer to the **IP Address Setup via Serial Port** section below.

~ Connect a *DGy 201x* directly to a PC using *DGy 201x*'s Ethernet port. Refer to **IP Address Setup via Ethernet** on page 136 for details.

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IP ADDRESS SETUP VIA SERIAL PORT

Use the following steps to change the *DGy 201x* IP address using the serial port:

1. Connect *DGy 201x* as outlined in the **Installation** section in Chapter 2 and set up the Hyperterminal as described in the **Serial Communications** section on page 131 of this chapter.
2. In the Hyperterminal window, type:

   ```
   IPADDR
   ```

   ... and press **ENTER**.

   DGy 201x responds 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 (as provided to by the network administrator).

▲ **Example**: If the new IP address is **192.168.1.190**, type:

```
IPADDR 192.168.1.190
```

... and press **ENTER**.

4. *DGy 201x* responds 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 *DGy 201x* and use the newly assigned IP address.

   ~ Press **n** to retain the current IP address, and discard the new address.
5. After the *DGy 201x* restarts, confirm the new setting by typing the command `IPADDR`. If the *DGy 201x* has accepted the command, it responds with the new IP address just entered.

Once IP address has been set, connect the PC to the *DGy 201x* using Ethernet. In Chapter 2, refer to the **DGy Applications Suite** section for instructions.

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IP ADDRESS SETUP VIA ETHERNET

DGy 201x's IP address can be set directly via Ethernet, using a Telnet session that enables remote login to the *DGy 201x* from a computer. This procedure is not required if the IP address was set using the method described in the **IP Address Setup via Serial Port** section on page 135.

Use the following procedure to set up the IP address with a Telnet session:

1. Use an Ethernet crossover cable or Ethernet hub to connect directly between the *DGy 201x*'s Ethernet port the network port of the PC.

Note

> For this procedure, the *direct* connection method is recommended over the network method. This avoids potential conflicts between *DGy 201x*'s default IP address and the network.

2. From the Start menu at the bottom of the Windows desktop select **Run**...
3. In the **Open** dialog box type **cmd** as shown in the following figure.

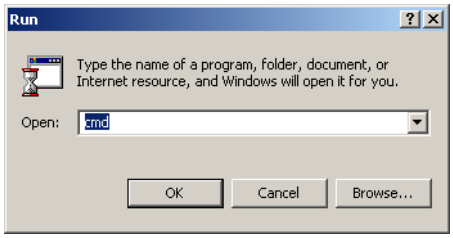


Figure B-5 Run Dialog Box

4. Click the **OK** to open the Windows command window.
5. At the command prompt in the command window type:

```
telnet <ipaddress> 8000
```

where <**ipaddress**> represents *DGy 201x*'s current IP address.

▲ **Example**: If the *DGy 201x* default IP address has not been changed, it should be set to:

```
192.168.1.200
```

Using the default IP address shown above, in the command line window, type:

```
telnet 192.168.1.200 8000
```

... and press **ENTER**.

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At this point, the Telnet window starts and *DGy 201x* responds with the product name and copyright notice as shown in **Figure B-6**.

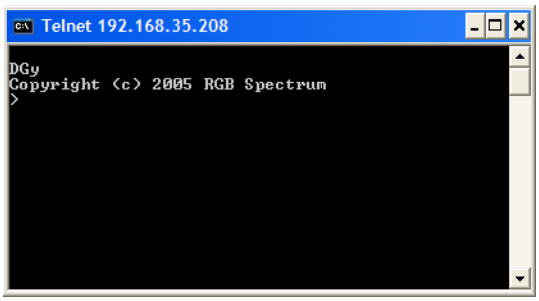


Figure B-6 Telnet Connected

6. To change the current IP address, type `IPADDR` followed by *DGy 201x*'s new IP Address (as provided by the network administrator).

▲ **Example**: If the new IP address is **192.168.1.190**, type:

```
IPADDR 192.168.1.190
```

... and press **ENTER**

DGy 201x responds 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 the IP address is changed from the Ethernet port, the Telnet connection and communication will be lost. This behavior is to be expected. Restart the Telnet session using the new IP address.

7. If **y** is pressed in the step above, the *DGy 201x* reboots and the Telnet connection is lost. Repeat steps 2 through 4 to establish a new Telnet session — except in step 4, type the new IP address.
8. Confirm the new setting by typing the command `IPADDR` and pressing **ENTER**. If the *DGy 201x* has accepted the command, it will respond with the new IP address.

In addition to setting the IP address, if required set the IP subnet mask (**IPSubNET**) and gateway (**IPGateWay**). See page 116 for more details.

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This completes the procedure for setting up the IP address via Ethernet. The *DGy 201x* can now be controlled either by directly issuing ASCII commands from the Telnet Window, or from the Web Control Panel using a standard web browser. Refer to Chapter 6, **Command Line Interface** for a complete command list.

Note

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

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FIRMWARE UPGRADE

IN THIS APPENDIX

RGB Spectrum periodically provides upgrades to the *DGy 201x* to add new features, change functionality or resolve technical problems. Check the *Support* section of the RGB Spectrum Web site for information about firmware upgrades.

This appendix provides detailed information about the upgrade process required to download and install new versions of the *DGy 201x* firmware. The manual, command line, method is described as is the use of the FTP Client for to upgrade firmware.

Upgrade Firmware Using the FTP Client

Manual Update Procedure

OBTAINING THE FIRMWARE

Each revision of firmware is provided with a copy of the firmware release notes which identifies changes and improvements associated with the new version. Reading the release notes before upgrading the firmware is recommended. Please contact RGB Spectrum Customer Service for questions and assistance.

Download the latest revision of the firmware from the RGB Spectrum web site **Support** section: **http://www.rgb.com/en/Support/DGy.asp**. The upgrade consists of two files: **FWDGY_x.y.z.tgz** and **FPGADGY_x.y.z.tgz**, where x.y.z represents the version number. The file name is case sensitive. Copy these files onto a local drive on the PC. **Do not rename the files**.

The use of a broadband connection is highly recommended as the upgrade files are approximately 8MB.

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UPGRADE FIRMWARE USING THE FTP CLIENT

The FTP Client may be used to upgrade firmware. The current firmware version is indicated in the WCP configuration window.

STARTING THE FTP CLIENT

1. Connect to the *DGy 201x* by typing the IP address of the *DGy 201x* in the address line of a browser.

   The first page that the browser displays is the *DGy 201x* **Applications Suite** page as shown in **Figure C-1**. If the DGy WCP is open, close it before proceeding.

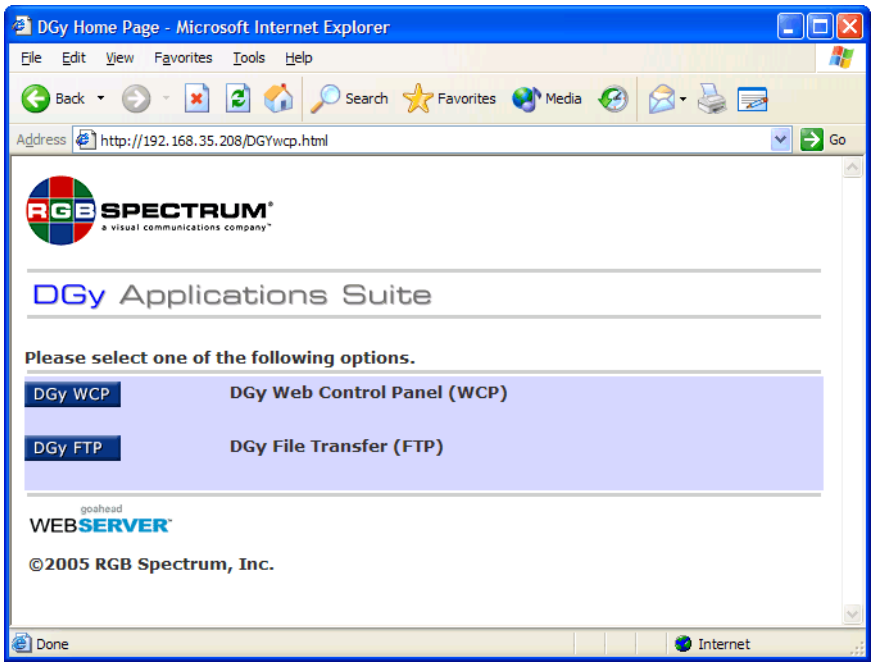


Figure C-1 ***DGy 201x*** **Application Suite Page**

2. Click on **DGy FTP** to open the client. A file download dialog similar to the one shown in **Figure C-2** will open.

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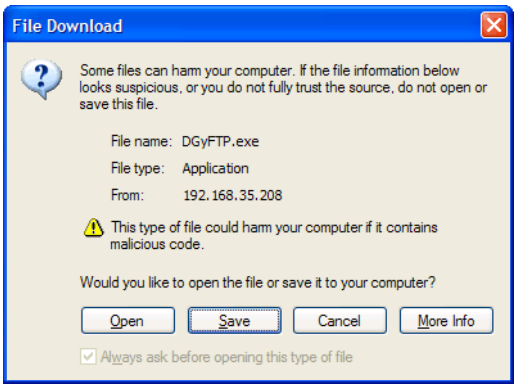


Figure C-2 File Download Warning

3. Click **Run** or **Open**, depending on software, to continue. If additional dialog boxes appear due to security applications, click the appropriate button to continue.

   After a pause of about 15 - 20 seconds, as the FTP Client application loads and the *DGy 201x* FTP Client window, shown in **Figure C-3**, is displayed.

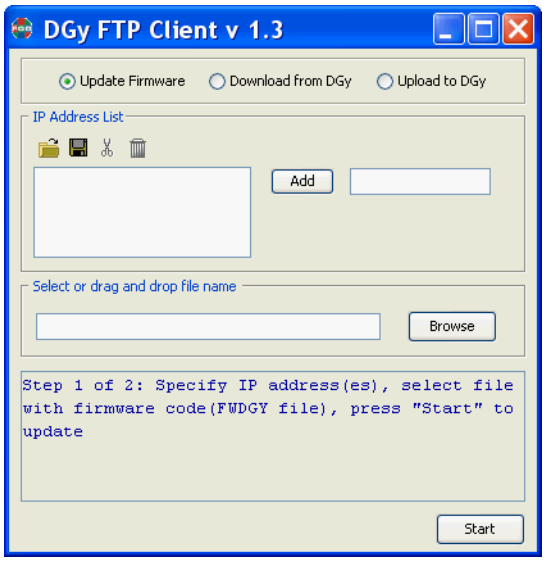


Figure C-3 *DGy 201x* FTP Client Window

4. Enter the IP address of the *DGy 201x* in the IP address entry box to the right of the **Add** button.
5. Click **Add** to add the IP address of the *DGy 201x* to the **IP Address List** on the left side of the window.

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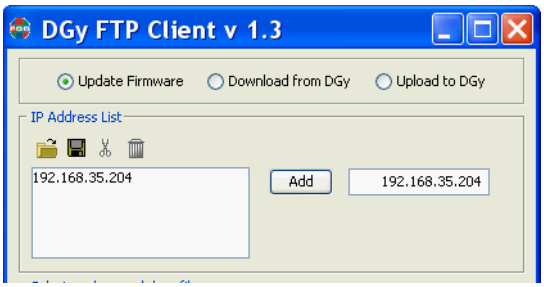


Figure C-4 *DGy 201x* FTP Update Firmware IP Address List

6) Click on the **Browse** button to navigate to the folder containing the firmware upgrade files copied to the PC. Select the file **FWDGY_x.y.z.tgz**. Alternatively, if the path is known, it may be typed directly into the entry box. A third method is to drag the file onto this area.

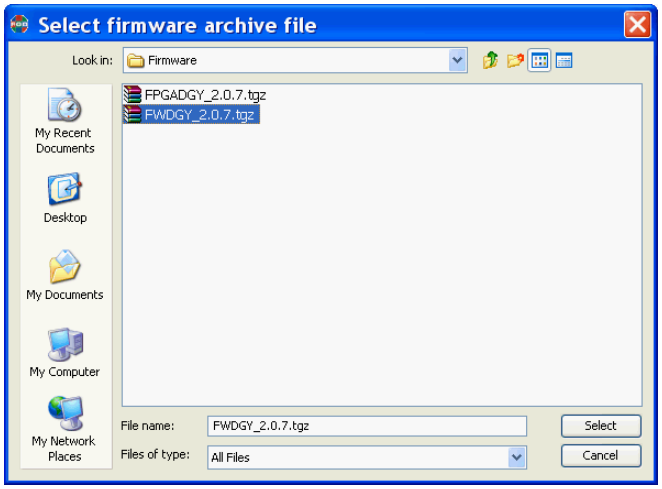


Figure C-5 FTP Select Firmware Archive File

The file name now appears in the box to the left of the **Browse** button as shown in **Figure C-6**.

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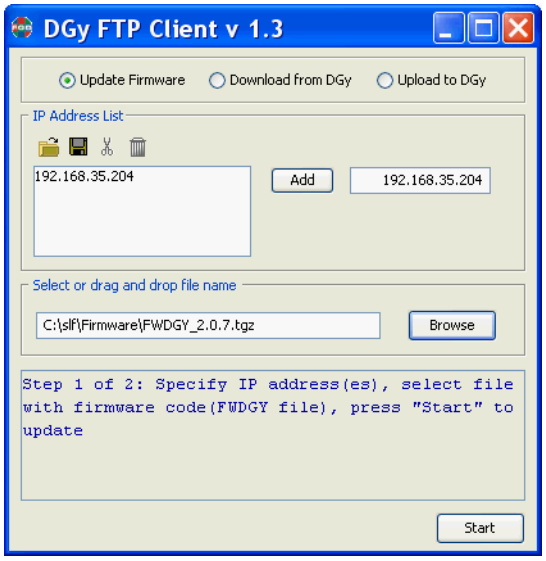


Figure C-6 FTP Firmware File Name

7) Click the **Start** button to begin the firmware upload from the PC to the *DGy 201x*. A **File transfer** status window will display the progress.

The *DGy 201x* will automatically update the firmware after it has transferred the file. When the update is complete. The FTP Client window will indicate readiness for the next step as shown in **Figure C-7**.

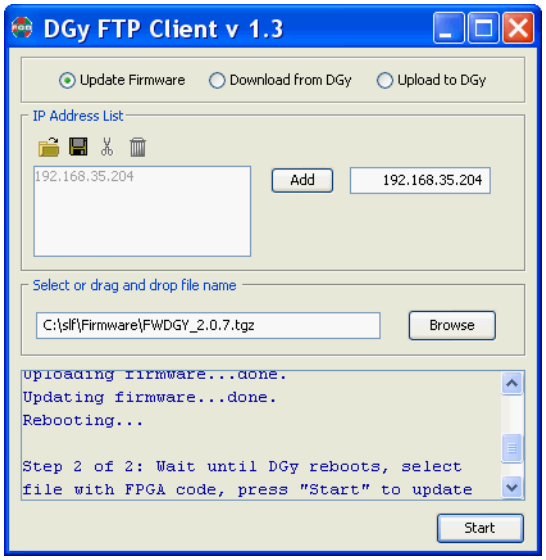


Figure C-7 FTP Updating Firmware Status

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FPGA UPDATE

8. Repeat steps 6 and 7 above for the **FPGADGY_x.y.z.tgz** file.

   The *DGy 201x* will automatically reboot upon completion of the firmware upgrade. During this time, communication with the *DGy 201x* will be lost.

9. Reconnect to the *DGy 201x* **Applications Suite** after the system has rebooted and relaunch the DGy WCP.

Open the WCP from the **Application Suite**; the **WCP Configuration** window will indicate the new firmware version. The upgrade is now complete.

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MANUAL UPDATE PROCEDURE

Download new firmware files **FWDGY.x.y.x.tgz** and **FPGADGY.x.y.z.tgz** from the RGB Spectrum web site to a PC. These files must be uploaded and installed in the correct sequence. Carefully follow the steps below.

FTP FIRMWARE FILE

1. Begin a Telnet session. See **IP Address Setup via Ethernet** for instructions on opening a command window.
2. Change to the directory on the PC that contains the new firmware.
3. Type **dir** to verify that the firmware files are present.
4. Type **ftp** followed by the IP address of the *DGy 201x*.

▲ **Example**: Assuming that the *DGy 201x* IP address is currently set to 192.168.1.150

Type: `ftp 192.168.1.150` and press **ENTER**.

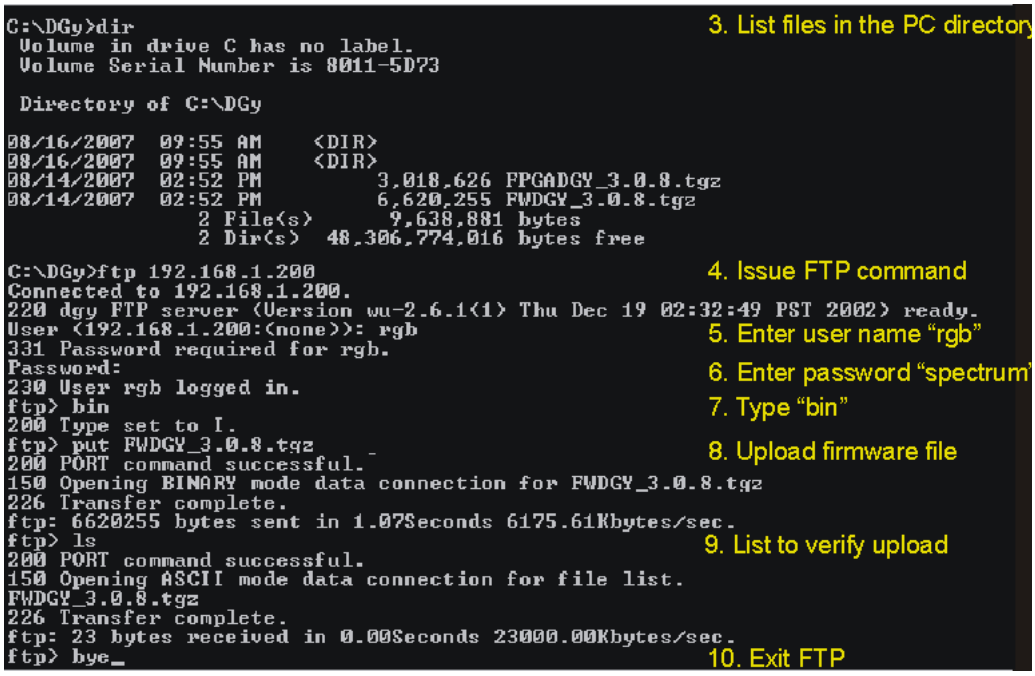


Figure C-8 FTP Firmware

5. Enter the user name **rgb**. The user name and password are case sensitive; enter in lower case only.
6. Enter the password **spectrum**.

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7. Type the command **bin** and press **ENTER**.

Caution Failure to enter the **bin** command will cause the files to be corrupted on transfer.

8. Upload the firmware to the *DGy 201x* by issuing the **put** command followed by the firmware file name. The file name is case sensitive and must be entered exactly. In the example shown in **Figure C-8** the entry is:

   `put FWDGY.3.08.tgz` press **ENTER**.

9. Type **ls** and press **ENTER** to verify that the file was uploaded.
10. Type **bye** and press **ENTER** to exit ftp.

UPDATE FIRMWARE

11. At the prompt, begin a new Telnet session.

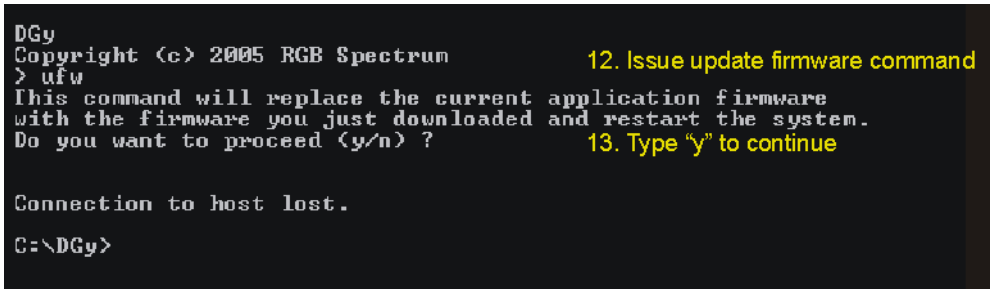


Figure C-9 Update Firmware Command

12. Type the **ufw** command and press **ENTER**.
13. Type **y** to proceed or **n** to terminate the process.

    After about 30 seconds, the connection to the host will be lost.

Important Communications with the *DGy 201x* will be lost during the installation process. This is normal and does not indicate that there is a problem with the installation process. This process approximately two minutes.

DO NOT turn the power off during this time.

FTP FPGA FILE

14) Re-establish the FTP connection as described in **Step 4.** above.
15. Enter the user name **rgb**.
16. Enter the password **spectrum** (case sensitive).

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17) Type the command **bin** and press **ENTER.**

18) Upload the file **FPGADGY_x.y.z.tgz** to the *DGy 201x* using the **put** command as in **Step 8.**.

19. Type **ls** and press **ENTER** to verify that the file was uploaded.

20. Type **bye** and press **ENTER** to exit ftp.

UPDATE FPGA

21. At the prompt, begin a Telnet session.

22. Type the **ufpga** command and press **ENTER**.

23. Type **y** to proceed or **n** to terminate the process.

Important

> Communications with the *DGy 201x* will again be lost during the installation process. This is normal and does not indicate that there is a problem with the installation process. This process may take several minutes.
>
> **Do NOT** turn the power off during this time.

24) Reconnect the serial emulator or start a new Telnet session with the *DGy 201x* and type **ver**. The *DGy 201x* should respond with the new firmware version number.

Alternately, restart the **Applications Suite** and click on DGy WCP. The new firmware version will be displayed in the WCP **Configuration** window.

The firmware upgrade process is now complete.

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CONTACT INFORMATION

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- E-Mail (technical support): **support@rgb.com**
- E-Mail (sales and product information): **sales@rgb.com**
- Website: **http://www.rgb.com**

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