

Pipeline™

User's Guide

Pipeline Firmware Version 2.4

Pipeline Direct Version 2.4

Pipeline Control for Windows Version 2.4.1

Pipeline SC
Pipeline Quad
Pipeline HD Dual



TELESTREAM

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Preface

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- Do not stack Pipelines more than two units high to avoid over-heating.
- Use only the power source supplied, and recommended in this manual.
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IEC950 (or EN60950/BS7002/VDE0805 May 1990)

UL1950

CSA C22.2-950-M89

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EC DIR 89/336/EEC

EN50082-1



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CHAPTER 1

Introduction

Pipeline™ is an industry-first, shareable, networked video capture system – a real-time media encoding and decoding hardware accessory. Pipeline systems provide real-time SD and HD SDI ingest and encoding into industry-standard QuickTime®, generic MXF OP1a, XDCAM® MXF, and Avid® MXF files, directly to network storage locations.

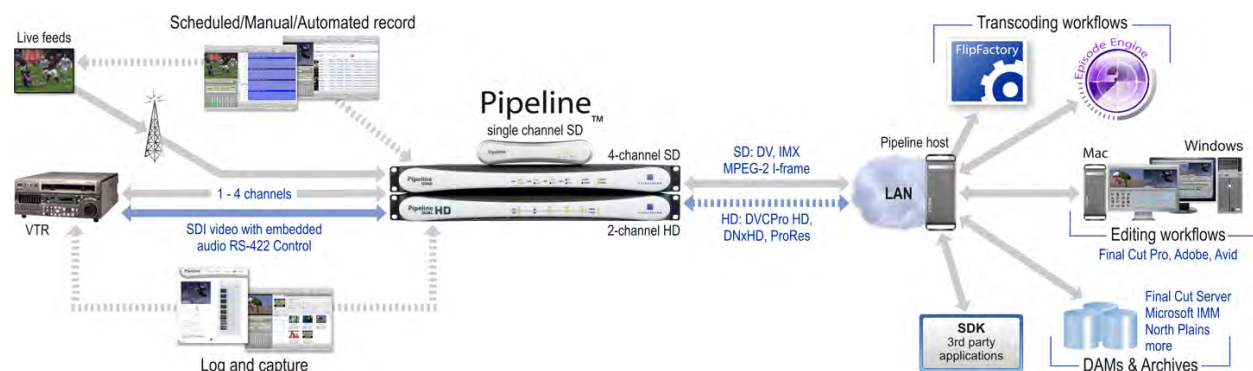
Pipeline can also be used to stream media directly into Telestream® FlipFactory® transcoding workflow automation and Episode® media encoding applications or encode media into TIFO® files. Pipeline can encode media into QuickTime for use in products including Apple's Final Cut Pro®. Digital media platforms can also play out QuickTime files to Pipeline for real-time decoding and playout to SD and HD SDI.

Pipeline ingests media from tape or live sources, making it ideal for integration in broadcast, post-production, government, and other professional media workflow applications. A Pipeline software development kit (SDK) is also available from Telestream, which enables integration in custom applications.

PIPELINE AUTOMATES REAL-TIME MEDIA WORKFLOWS

Designed into Pipeline is ease of use for broadcasters, post-production houses, government agencies, universities, and video professionals. Setting up a Pipeline is easy. Connect Ethernet and SDI, attach an optional VTR, and configure your network settings – you're often up and running in under ten minutes.

Figure 1–1. Pipeline automates and adds value to real-time transcoding workflows



Pipeline SC and Quad can play out SD QuickTime files with DV, IMX 30|40|50, ProRes 422 files to Pipeline client systems for decoding into SDI (NTSC or PAL format) in real time. Pipeline also provides a fast and easy way to ingest media from tape in real time, encode to the same formats plus MJPEG A, and save the file to servers, archives, or digital asset management systems.



TELESTREAM'S PIPELINE FAMILY OF PRODUCTS

Pipeline SC

Pipeline SC is a single-channel, single-session device. It is ideally suited for low-volume workflows where easy location and setup is important.

Figure 1–2. Pipeline SC – compact, and easy to set up



Pipeline SC offers these features:

- Network-accessible SDI video encoding and playout
- Real-time encoding from standard definition NTSC/PAL SDI to DV, DVCPro, IMX 30|40|50, ProRes 422 SQ (SD), MJPEG A, and MPEG-2 50 mb/sec I-frame video
- Real-time decoding from SD DV, DVCPro, IMX, and ProRes 422 SQ to PAL/NTSC SDI video
- Extends FlipFactory, Final Cut Pro, and Episode to include workflows with tape or live sources
- VBI closed caption and timecode data extraction
- Shared network access to Pipeline saves time, effort and money
- Digitizes tapes into online libraries for an end-to-end DAM solution
- Records clips to tape for sharing with clients or colleagues.

Pipeline Quad

Pipeline Quad is a four-channel, rack-mounted system with Gigabit Ethernet and four independent Pipeline channels. Pipeline Quad also has an SDI Reference input for synchronizing output streams and for extracting a VITC timecode.

Figure 1–3. Pipeline Quad – four-channels for high-volume applications



The Pipeline Quad's rack-mount form is ideal for high-volume, scalable workflows where throughput and performance are important factors.

Pipeline Quad performs all encoding and decoding available in Pipeline SC, and adds these features:

- Four concurrent, independent Pipeline channels on a single, rack-mount device
- SDI Sync reference channel (sync in only) for frame-synchronized playout across all channels
- Optional, configurable confidence monitoring of client-bound video on a dedicated channel
- Gigabit Ethernet and dual, common power supplies for increased fail-safe operation.



Pipeline HD Dual

Pipeline HD Dual is a two-channel, rack-mounted system with dual Gigabit Ethernet enabling two independent Pipeline HD channels. Pipeline HD Dual also has an SDI Reference input for synchronizing output streams and for extracting VITC timecode.

Figure 1–4. Pipeline HD Dual – two channels for high-volume HD applications



The Pipeline HD Dual's rack-mount form is ideal for high-volume, scalable workflows where throughput and performance are important factors.

Pipeline HD Dual performs all encoding and decoding available in Pipeline SC, and adds these features:

- HD codec support for Uncompressed SD 8- and 10-bit, Apple ProRes 422 HD, Avid DNxHD, and DVCPHD
- Two concurrent, independent Pipeline HD channels on a single, rack-mount device
- Sync reference channel (sync in only) for frame synchronized playout across all channels
- Gigabit Ethernet for each channel and dual, common power supplies for increased fail-safe operation.

PIPELINE BENEFITS

A better way to ingest baseband media

Pipeline is a dedicated, external media decoding and encoding device with flexible Ethernet connectivity that offers significant advantages and cost savings over typical capture card solutions. It is more reliable, eliminating the susceptibility of a server/card model. Pipeline also removes operating system and driver incompatibilities, and reduces the need to use an expensive broadcast server channel.

Accessible from any workstation on your network

Shared network access makes Pipeline a cost-effective video capture solution. FlipFactory users can access Pipeline via Pipeline Direct, an embedded Web app, eliminating the need for dedicated workstations for each user. Factories can be designed to ingest media from Pipeline using edit decision lists (EDLs) to transcode media in real time.

You can also access and control Pipelines via Pipeline Control, a client application for controlling capture and play out from Pipeline devices. Pipeline Control is available for both Mac OS X and Windows users. Pipeline control provides document types to provide log and capture, scheduled capture and play out, and manual and automated recording. Pipeline Control supports both SD and HD Pipeline devices.

Accelerate FlipFactory and Episode Engine workflows

Whether from live or tape sources, Pipeline allows for transcode while capturing. FlipFactory and Episode Engine begin the transcoding process immediately as files are being captured by Pipeline. Simultaneous



transcoding in FlipFactory and Episode Engine greatly improves overall workflow throughput. High-resolution files can be directed to storage, while a proxy or other version is being created. RS-422 deck control provides frame accurate ingest from professional tape machines.

Supports a broad range of SD and HD formats

Pipeline features broad format support in a single device. Pipeline is network-configurable to capture Standard Definition 8-bit Uncompressed, DV and DVCPro 25, IMX 30|40|50, ProRes 422 SQ, and High Definition DVCProHD, DNxHD and ProRes 422 and play out Standard Definition DV and DVCPro 25, IMX 30|40|50, ProRes 422 SQ. With Pipeline, there's no need to have multiple dedicated devices to handle your changing format needs. Plus, you can upgrade Pipeline right on the network to easily add new formats and features as they become available from Telestream.

Extend FlipFactory and Episode Engine Workflows

This innovative, network-ready video capture accessory extends FlipFactory and Episode Engine workflows, enabling high-performance, real-time ingest of high-quality baseband media directly into FlipFactory or Episode Engine transcoding workflows.

You can use Pipeline Direct, a powerful embedded Web app in every Pipeline, to control (with a VTR) and preview streaming video, create and save EDL files, and crash record SD media into a TIFO ([Telestream Intermediary Format \(TIFO\) on page 116](#)) file for further processing.

Batch ingest from an EDL file allows users to encode multiple clips from a single tape. Plus, FlipFactory can automatically pick up EDLs from monitored folders for easy EDL integration.

You can schedule live ingest with Pipeline to capture incoming feeds at any time. By setting the start time and duration, live feeds, such as satellite, can be encoded and delivered when needed. You can also encode analog tapes into online digital libraries and asset management systems.

Pipeline can also be used to archive high-quality master files into DAM systems. Using the powerful metadata extraction tools in FlipFactory, master assets, proxy files and all associated metadata can be delivered to DAM systems in one single-step process.



CHAPTER 2

Pipeline Hardware, Installation & Setup

Use this chapter to unpack and set up Pipeline SC, Pipeline Quad, and Pipeline HD Dual devices, connect video equipment, and configure the Pipeline for a LAN connection. Before proceeding, work with your network administrator to determine network setting requirements: IP address (automatic link-local, DHCP, or static) and netmask, and the gateway address. You should also understand your media workflow requirements and read [Network and Hard Disk Performance Requirements \(page 36\)](#).



Note

Topics in this chapter refer to all Pipeline devices unless specifically noted.

To set up and configure your Pipeline correctly, complete the tasks in this chapter, referring to [Chapter 5, Using the Configure Panel on page 44](#) for network configuration tasks.

Topics

- [Environmental Operating Requirements \(page 6\)](#)
- [Power Requirements \(page 6\)](#)
- [Unpack the Pipeline \(page 6\)](#)
- [Locate the Pipeline SC \(page 7\)](#)
- [Locate the Pipeline Quad | Pipeline HD Dual \(page 7\)](#)
- [Pipeline SC Hardware \(page 9\)](#)
- [Pipeline Quad Hardware \(page 11\)](#)
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- [Connecting Pipeline to Mac OS X or Windows Computers \(page 17\)](#)
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- [Powering up the Pipeline \(page 19\)](#)
- [Configuring & Connecting to Pipelines \(page 20\)](#)
- [Registering Your Pipeline with Telestream \(page 22\)](#)



ENVIRONMENTAL OPERATING REQUIREMENTS

Plan adequate space for cable routing from the back of the chassis. Ensure that the Pipeline is in close proximity to your Ethernet and video cables, and that cable connectors are not stressed, bent, or crimped. Also make sure that you have adequate space for a VTR deck, if necessary.



Caution

Do not place more than two Pipeline SCs in a stack. If you do, you risk overheating a unit, potentially leading to operational failure.

Allow at least six inches (15 cm) of space between the Pipeline and the nearest object to ensure adequate airflow. Keep the temperature range within acceptable limits (table below), and keep humidity moderate in the vicinity. Temperature specifications are as follows:

Table 2–1. Operating and Storage Temperature Parameters

Modes	Temperature Ranges
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 60°C (-40°F to 140°F)

POWER REQUIREMENTS

Input Voltage. Auto-sensing 100 to 240V AC, 50/60Hz



Caution

Telestream recommends connecting computer equipment to AC power through an uninterruptible power supply (UPS) with surge protection. Fluctuations in commercial supply voltage can damage unprotected electronic equipment.

A high quality surge suppressor may be substituted if a UPS is not available, but it may not provide adequate protection.

UNPACK THE PIPELINE

Unpack the contents of the original shipping container; identify each component and determine that they are in satisfactory condition. If any shipping damage is visible, note it on your shipping documents and contact your shipping agent and Telestream or authorized Telestream distributor.



Note

Save all packaging materials and store them in a safe place. If you require service – or move your Pipeline – the packaging materials may be used for safe shipment.



Pipeline SC Shipping Container Contents

In addition to the Pipeline itself, each package contains the following:

- Software Installation and User's Guide CD-ROM
- Power adapter with power cord
- Quick Start Guide (in CD case)

Pipeline Quad Shipping Container Contents

In addition to the Pipeline itself, each package contains the following:

- Software Installation and User's Guide CD-ROM
- Power cords
- Quick Start Guide (in CD case)

Pipeline HD Dual Shipping Container Contents

In addition to the Pipeline itself, each package contains the following:

- Software Installation and User's Guide CD-ROM
- Power cords
- Quick Start Guide (in CD case)

LOCATE THE PIPELINE SC

For permanent locations, select a stable and level, smooth, hard surface. Avoid carpeted or cloth-covered surfaces which inhibit airflow or reduce heat dissipation, which contributes to overheating. Select an isolated area that provides a proper operating environment and protection from accidental damage to the Pipeline. Route power and Ethernet and other cables to protect users from a tripping hazard and damage to the Pipeline.

LOCATE THE PIPELINE QUAD | PIPELINE HD DUAL

For permanent locations, mount the Pipeline Quad|HD Dual in a single rack-unit slot in a computer rack and secure it in place. Make sure the following issues are adequately addressed:

Elevated Operating Ambient. If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified (Table 2–1 on page 6).

Reduced Air Flow. Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading. Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading. Consideration should be given to the connecting equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be given when addressing this concern.



Reliable Earthing. Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips). Alternately, select a stable and level, smooth, hard surface. Avoid carpeted or cloth-covered surfaces, which can inhibit airflow or reduce heat dissipation, and contribute to overheating. Select an isolated area that provides a proper operating environment and protection from accidental damage to the Pipeline. Route power and Ethernet and other cables to protect users from a tripping hazard and damage to the Pipeline.



PIPELINE SC HARDWARE

The Pipeline SC is 7.5 inches (19.1 cm) wide, 5.5 inches (14.0 cm) deep, and 1.5 inches (3.8 cm) high.

Pipeline SC is a compact, network-ready SDI encoder/decoder device equipped with 10/100Mb Ethernet using TCP/IP, UDP, RTSP, and RTP and Bonjour for service discovery, plus Serial Digital Interface (BNC, SMPTE-259M 270mb/sec) with 8-channel embedded audio input and output ports with automatic detection of 525/625, and an RS-422 deck control port using Sony 9 Pin Protocol.

Pipeline can encode and decode NTSC or PAL with DV/DVCPRO 25Mb, IMX 30|40|50 and MPEG-2 I-Frame 50Mb video (encode only, in FlipFactory workflows), and 48 kHz, 16 bit, uncompressed audio.

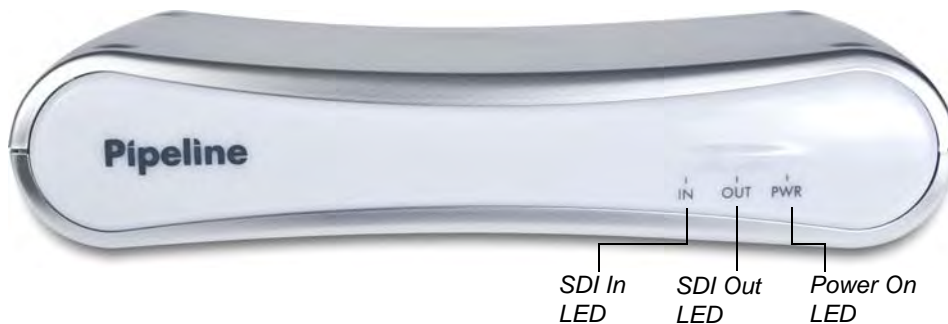
Processing VBI Closed Caption and Timecode

Pipeline automatically processes Vertical Blanking Interval (VBI) data on ingest operations to obtain closed caption and timecode data. Closed captions are extracted from line 21, and timecode from lines 16 through 20 (5 lines beginning with line 16). The last line (usually 20) with a valid timecode is the line whose data is used. Pipeline encodes the closed caption and timecode data into the data stream of the digital output, making it available for processing by client applications, such as FlipFactory and Episode.

Front Panel Indicators

The front panel contains LED indicators, making it easy to check its status.

Figure 2–1. Pipeline SC front panel



There are three LEDs you use to determine the state of the Pipeline:

Power. Lights green when power is present.

SDI In. Lights green when Pipeline is configured to encode SDI In and send it out via Ethernet. How media is encoded is determined by the selected codec. If the LED lights orange, data is being lost. The reason should be corrected before continuing operation. During a firmware upgrade, this LED lights yellow until you reboot.

SDI Out. Lights green when the Pipeline is configured to encode digital media from the Ethernet port, and send decoded media to the SDI Out port. If the LED lights orange, data is being lost. The reason should be corrected before continuing operation.



Rear Panel Ports and Connectors

The rear panel contains the power jack, plus video and network connector ports.

Figure 2–2. Pipeline SC rear panel



When connecting video equipment, Ethernet, and RS-422 cables, be sure that the power supply is disconnected from the Pipeline. Failure to do so may result in equipment malfunction or damage.

DC Power Port. Use to connect and turn on the Pipeline. Only connect the Pipeline to power using the Telestream-supplied power supply.

10/100 Ethernet Port. The Ethernet port has two LEDs:

Link (left LED): If the LED is not lit, no link is available. If the LED is lit orange, link has been established.

Connection/Activity (right LED): If the port is connected at 100 Mb, the LED lights green, and blinks on activity. If the port is connected at 10 Mb, the LED is unlit, but blinks green during activity.

RS-422. Female DB-9 RS-422 port for VTR, using Sony 9 Pin protocol.

SDI In. BNC jack for SDI input signal.

SDI Out. BNC jack for SDI output.



Caution

If the Connection LED is unlit, the Pipeline is operating at 10 Mb, which is unacceptable for real time video traffic. Resolve the problem before continuing, to avoid video stream data loss.



PIPELINE QUAD HARDWARE

The Pipeline Quad is 17.3 inches (43.9 cm) wide, 13.2 inches (33.5 cm) deep, and 1.5 inches (3.8 cm) high. Pipeline Quad is a single rack unit, with four onboard SDI encoder/decoder devices equipped with an external Gigabit Ethernet port and an onboard switch routing 100Mb Ethernet to each device, using TCP/IP, UDP, RTSP, and RTP and Bonjour for service discovery. Serial Digital Interfaces are provided for each device (BNC, SMPTE-259M 270mb/sec) with four 8-channel embedded audio input and output ports with automatic detection of 525/625, and RS-422 deck control ports, using Sony 9 Pin Protocol.

Pipeline Quads can encode and decode NTSC or PAL with DV/DVCPRO 25Mb, IMX 30, 40, 50, and MPEG2 I-Frame 50Mb video (encode only, in FlipFactory workflows), and 48 kHz, 16 bit, uncompressed audio, in up to four concurrent sessions; each individual Pipeline channel operates independently, each communicating via a common physical Ethernet port on the Quad's backplane.

The Pipeline Quad provides common, dual power supplies for redundancy and fail-safe operation. The Pipeline can operate normally on a single power supply, but you lose the safety of the second power supply.

Using SDI Sync Input

The SDI Sync Input is used in both capture and playout modes but for two different purposes.

In capture mode, the SDI Sync Input is used as a method for supplying a common timecode reference to all input channels. For the timecode to be extracted, the SDI signal connected to the SDI Sync Input must contain a valid timecode in the vertical blanking area of the signal. This timecode is usually referred to as VITC (vertical interval timecode). The SDI signal must be a digital signal that is frame synchronized with the SDI signals used as the input video source for the timecode extraction to work properly. An analog signal cannot be connected to the SDI Sync input.

In playout mode, the SDI Sync Input is used as a frame synchronization source for each of the SDI outputs. Any timecode on the SDI Sync Input is ignored in this mode. If no signal is connected to the SDI Sync Input, each of the SDI outputs will free run (i.e. they will not be synchronized with each other or with any house reference). An analog signal cannot be connected to the SDI Sync input.

Using SDI Sync Out

The SDI Sync Out port is a re-clocked loop-through port of SDI Sync In. You can use this re-clocked reference for additional Pipelines or other devices.

Processing Closed Caption and Timecode Data

Pipeline automatically processes Ancillary Data on ingest operations to obtain closed captions and timecode data. Pipeline encodes the closed caption and timecode data into the data stream of the digital output, making it available for further processing by client applications, such as FlipFactory and Episode.

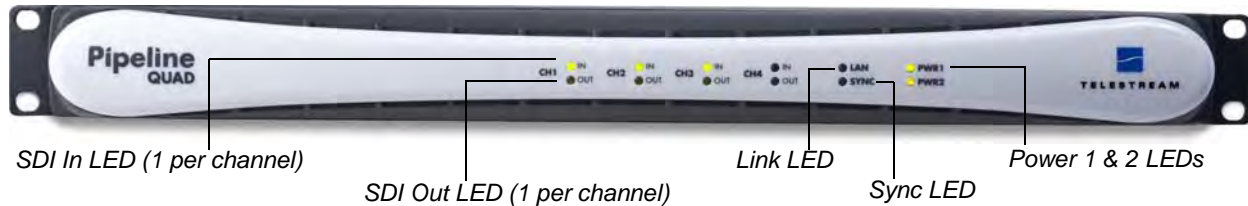
The Pipeline automatically analyzes the signal during the Vertical Blanking Interval (VBI) on ingest operations to obtain closed captions and timecode data. Closed caption data is extracted from line 21, and timecode data from lines 16 through 20 (the 5 lines beginning with line 16). The last line (usually line 20) with a valid timecode is the line whose data is used.



Front Panel Indicators

The front panel contains LED indicators, making it easy to check its status.

Figure 2–3. Pipeline Quad front panel



SDI In. One per channel. Lights green when the Pipeline is configured to decode SDI In and send it out via the Ethernet port. Media is encoded based on the selected codec. If the LED lights orange, data is being lost. Correct problem before continuing. During a firmware upgrade, the LED lights yellow until you reboot.

SDI Out. One per channel. Lights green when the Pipeline is configured to encode digital media from the Ethernet port, and send decoded media to the SDI Out port. If the LED lights orange, data is being lost. The reason should be corrected before continuing operation.

The LED blinks orange at one second intervals when the internal Ethernet switch and network that connects the four Pipelines has failed. Usually, at least one of the Pipelines can't communicate, indicating that potentially an input channel has failed, and confidence monitoring is not operational. Reboot to solve the problem, or contact Telestream customer service.

Link. Lights green when Ethernet link has been established.

Sync. Lights green when an SDI signal is detected on the sync reference input channel.

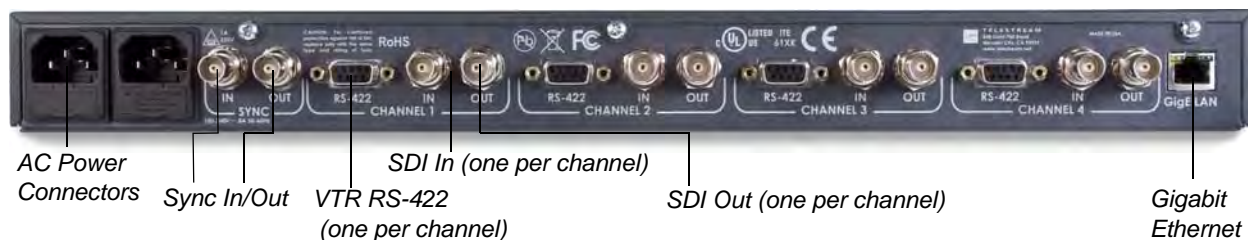
PWR 1 & 2. Lights green when power is present and the power supply is operating normally. PWR1 indicates power supply 1; PWR2 indicates power supply 2. An orange PWR LED indicates a failed power supply or that no power is present.

If a power supply fails, complete jobs in progress. RMA the Pipeline to Telestream for repair as soon as practical.

Rear Panel Ports and Connectors

The rear panel contains power plugs, plus video and network connector ports.

Figure 2–4. Pipeline Quad rear panel



When connecting video equipment, Ethernet, and RS-422 cables, be sure that the power supply is disconnected from the Pipeline. Failure to do so may result in equipment malfunction or damage.



AC Power Plugs. Use to connect and turn on the Pipeline. Only connect the Pipeline Quad to power using the Telestream-supplied power cords. To insure fail-safe operation, be sure to use both power supplies. These supply common power to the Pipeline; if one power supply fails, the Pipeline continues to operate.

Sync In. The SDI Sync Input is used in both capture and playout modes but for two different purposes. In capture mode it is used as a method for supplying a common timecode reference to all input channels. In playout mode it is used as a frame synchronization source for each of the SDI output channels. (See "Using SDI Sync Input" on page 11.)

Sync Out. Re-clocked loop-through port of SDI Sync In. You can use this re-clocked reference for additional Pipelines or other devices.

RS-422. Female DB-9 RS-422 port for VTR, using Sony 9 Pin Protocol (one per channel).

SDI In. BNC jack for SDI input (one per channel).

SDI Out. BNC jack for SDI output (one per channel).

Gigabit Ethernet Port. The Ethernet RJ-45 jack has two LEDs: If the left, orange LED is lit and the right, green LED is lit, the port is operating at 1Gbs (gigabit). If only the orange LED is lit, the Ethernet port is not connected. Be sure to use CAT-6 cabling end-to-end from Pipeline to your Macintosh or Windows PC client for best results.



Caution

If only the green LED is lit or the LED is unlit, the Pipeline is operating at 100 or 10 Mb respectively. These data rates are unacceptable for real time video traffic from all four channels. Resolve the problem by connecting at 1 Gbs before processing jobs to avoid data loss.



PIPELINE HD DUAL HARDWARE

The Pipeline HD Dual is 17.3 inches (43.9 cm) wide, 13.2 inches (33.5 cm) deep, and 1.5 inches (3.8 cm) high. Pipeline HD Dual is a single rack unit, with two onboard HD/SD-SDI encoder/decoder devices equipped with two external Gigabit Ethernet ports, using TCP/IP, UDP, RTSP, and RTP and Bonjour for service discovery. Serial Digital Interfaces are provided for each device (BNC, SMPTE-259M 270mb/sec) with two 8-channel embedded audio input and output ports with automatic input format detection, and RS-422 deck control ports, using Sony 9-Pin Protocol.

Pipeline HD Dual can encode DV/DVCPRO 25, IMX 30|40|50, MPEG-2 50M I-frame (FlipFactory workflows), ProRes SD/HD, Avid DNxHD and DVCPHD video, and 48 kHz, 16/24 bit, uncompressed audio.

Using SDI Sync Input

The SDI Sync Input is used in both capture and playout modes but for two different purposes.

In capture mode, the SDI Sync Input is used as a method for supplying a common timecode reference to all input channels. For the timecode to be extracted, the SDI signal connected to the SDI Sync Input must contain a valid timecode in the vertical blanking area of the signal. This timecode is usually referred to as VITC (vertical interval timecode). The SDI signal must be a digital signal that is frame synchronized with the SDI signals used as the input video source for the timecode extraction to work properly. An analog signal cannot be connected to the SDI Sync input.

In playout mode, the SDI Sync Input is used as a frame synchronization source for each of the SDI outputs. Any timecode on the SDI Sync Input is ignored in this mode. If no signal is connected to the SDI Sync Input, each of the SDI outputs will free run (i.e. they will not be synchronized with each other or with any house reference). An analog signal cannot be connected to the SDI Sync input.

Processing Closed Caption and Timecode Data

Pipeline automatically processes Ancillary Data on ingest operations to obtain closed captions and timecode data. Pipeline encodes the closed caption and timecode data into the data stream of the digital output, making it available for further processing by client applications, such as FlipFactory and Episode.

When a Standard Definition SDI signal is connected, the Pipeline automatically analyzes the signal during the Vertical Blanking Interval (VBI) on ingest operations to obtain closed captions and timecode data. Closed caption data is extracted from line 21, and timecode data from lines 16 through 20 (the 5 lines beginning with line 16). The last line (usually line 20) with a valid timecode is the line whose data is used.

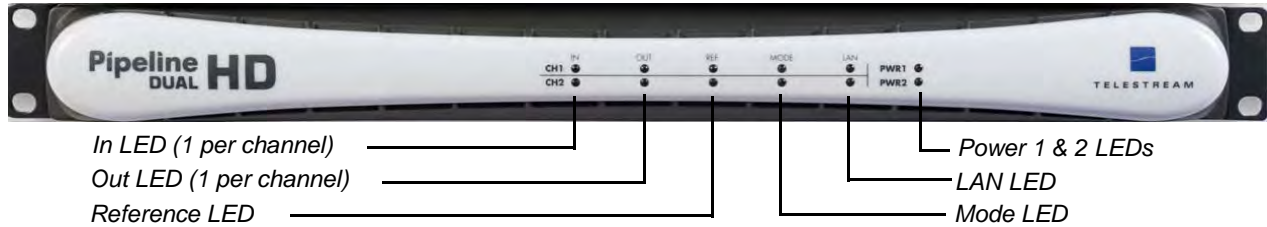
When an HD SDI signal is connected, the Pipeline automatically processes all ancillary data packets to obtain closed captions and timecode data. Closed caption data is extracted from Ancillary data packets with a DID of 0x161 and timecode data is extracted from Ancillary data packets with a DID of 0x260.



Front Panel Indicators

The front panel contains LED indicators, making it easy to check its status.

Figure 2–5. Pipeline HD Dual front panel



SDI In. One per channel. Lights green continuously when an HD source is connected. Flashes green when an SD source is connected. If the LED flashes orange, data is being lost. Fix problem before continuing.

SDI Out. One per channel. Lights green continuously when HD format media is being output. Flashes green when SD format media is being output. If the LED lights orange, data is being lost. The reason should be corrected before continuing operation

Mode. Lights green continuously when the selected codec is creating HD content. Flashes green when the selected codec is creating SD content.

Reference. Lights green continuously when an HD source signal is detected on the sync input reference channel. Flashes green when the source signal is SD.

Sync. Lights green when an HD source signal is detected on the sync input reference channel. Flashes green when the source signal is SD.

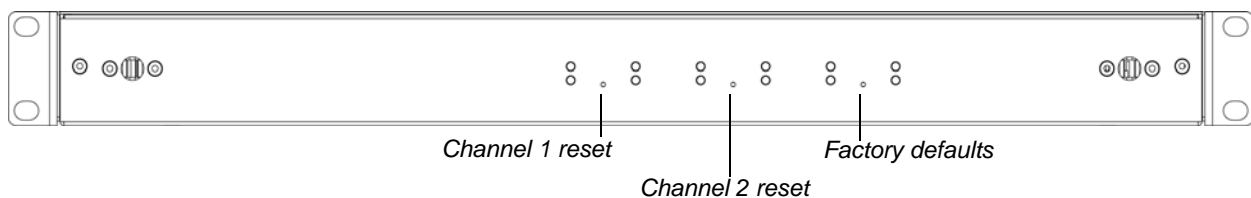
LAN. Flashes green to indicate LAN activity.

PWR 1 & 2. Lights green when power is present and the power supply is operating normally. PWR1 indicates power supply 1; PWR2 indicates power supply 2. Orange indicates a failed power supply or that power is not present. If a power supply fails, complete jobs in progress and RMA the Pipeline to Telestream for repair as soon as practical.

Front Panel Reset Switches

With the front panel bezel removed, three recessed reset buttons are exposed. They are not labelled.

Figure 2–6. Pipeline HD Dual reset switches behind front panel



Channel 1 Reset. Depress the recessed button to perform a hardware reset on Channel 1. The channel will be disconnected from any client currently attached.

Channel 2 Reset. Depress the recessed button to perform a hardware reset on Channel 2. The channel will be disconnected from any client currently attached.



Factory Default Reset. Depress the recessed button to restore the factory defaults of the Pipeline device. Both channels are returned to their original factory default values, including IP address and any options selected. During reset all LEDs glow green. When reset is complete, the LEDs return to their normal state.



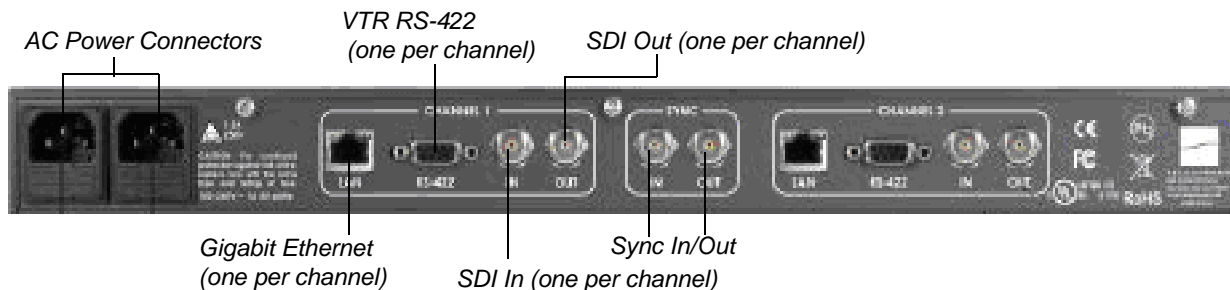
Note

Resetting factory defaults does not change the firmware or app loader versions.

Rear Panel Ports and Connectors

The rear panel contains power plugs, plus video and network connector ports.

Figure 2–7. Pipeline HD Dual rear panel



When connecting video equipment, Ethernet, and RS-422 cables, be sure that the power supply is disconnected from the Pipeline. Failure to do so may result in equipment malfunction or damage.

AC Power Plugs. Use to connect and turn on the Pipeline. Only connect the Pipeline Quad to power using the Telestream-supplied power cords. To insure fail-safe operation, be sure to use both power supplies. These supply common power to the Pipeline; if one power supply fails, the Pipeline continues to operate.

Sync In. The SDI Sync Input is used in both capture and playout modes but for two different purposes. In capture mode it is used to supply a common timecode reference to all channels. In playout mode it is used as a frame synchronization source for each SDI output channel. (See “Using SDI Sync Input” on page 11.)

Sync Out. Re-clocked loop-through port of SDI Sync In. Use for additional Pipelines or other devices.

RS-422. Female DB-9 RS-422 port for VTR, using Sony 9 Pin Protocol (one per channel).

SDI In. BNC jack for SD-SDI or HD-SDI input (one per channel).

SDI Out. BNC jack for SD-SDI or HD-SDI output (one per channel).

Gigabit Ethernet Ports. Each Ethernet RJ-45 jack has two LEDs: If the left, orange LED is lit and the right, green LED is lit, the port is operating at 1Gbs (gigabit). If only the orange LED is lit, the Ethernet port is not connected. Be sure to use CAT-6 cabling end-to-end from Pipeline to your Macintosh or Windows PC client for best results.



Caution

If only the green LED is lit or the LED is unlit, the Pipeline is operating at 100MB or less – rates unacceptable for real time video on all four channels. Resolve the problem by connecting at 1 Gb/sec. before processing jobs to avoid data loss.



CONNECTING PIPELINE TO MAC OS X OR WINDOWS COMPUTERS

Pipeline can be connected to a Mac OS X computer – a Final Cut Pro workstation or Episode Engine server, for example. Or, it can be connected to a Windows computer – a FlipFactory server or Pipeline Control workstation, for example. You can connect Pipelines directly or via LAN using a Gigabit Ethernet (Gig-E) switch for Pipeline Quad|HD Dual or 100MB Ethernet for Pipeline SC.



Note

For workstations or servers with multiple network adapters, you should always connect the Pipeline (or switch) to the second interface on the system (Windows: Local Area Connection 2, Mac OS X: en1).

If you are not able to connect to Pipelines using this configuration you may have devices on your first network using the same address scheme as your Pipelines. To correct this, run the following commands in a command window (verify with your network administrator).

This example is for modifying your system's routing table for a Pipeline configuration using the default 169.254.xxx.xxx self-assigned address scheme. Modify these commands accordingly for your configuration:

Mac OS X:

To remove:

```
sudo route delete -net 169.254.0.0/16
```

To add it back to en1:

```
sudo route add -net 169.254.0.0/16 -interface en1
```

Windows:

To remove:

```
ROUTE DELETE 169.254.0.0
```

To add it back to LAN Connection 2:

```
ROUTE -p ADD 169.254.0.0 MASK 255.255.0.0 [your IP] IF [second interface index]
```

The PC command requires that you know your current IP address, as well as the interface index of the adapter your Pipelines are connected through. A list of interface indexes can be obtained by typing:

```
ROUTE PRINT
```

The interface indexes are listed above the routing table and have the format of: 0x#...

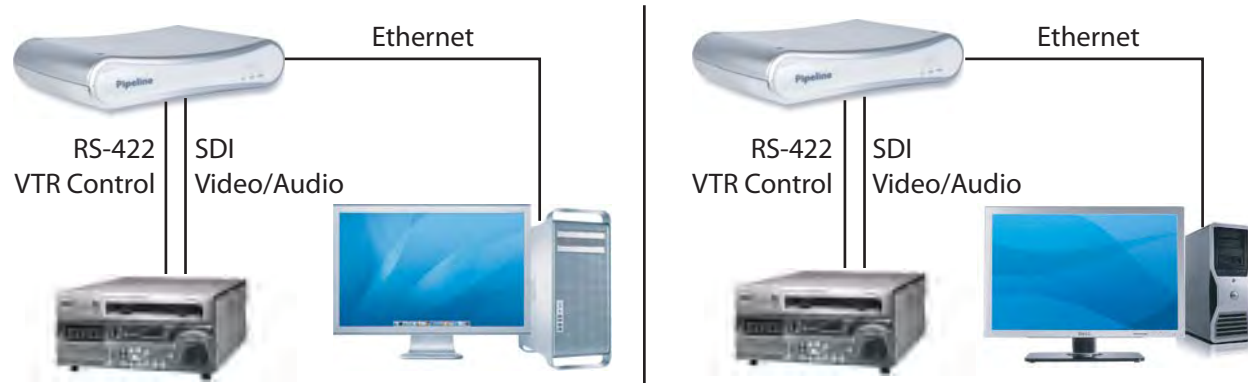
These steps may need to be repeated whenever the routing tables are flushed (for example, when the system is restarted).

Telestream recommends turning off your WiFi card when using Pipelines.



Use the instructions in this section to make Ethernet and video connections to your Pipeline when connecting it directly to a Mac OS X or Windows computer – either directly or via a switch.

Figure 2–8. Pipeline video, VTR & network connections



1. Make sure the Pipeline is not plugged in.
2. Connect the Pipeline Ethernet port directly or via a switch to the computer with an Ethernet cable.
3. Connect your VTR SDI Out port to the Pipeline SDI In port with a BNC coax cable connected to your video source – a VTR, for example.
4. (Optional) Connect the VTR RS-422 Out port to the Pipeline RS-422 port.
5. (Pipeline Quad – Optional) Connect video equipment to your Sync In and Sync Out video ports.

ADDING PIPELINE TO A NETWORK

One or more Pipelines can connect to a LAN. To assure acceptable performance, be sure to connect Pipelines to a media network or a *single* Gigabit switch dedicated specifically for Pipelines, edit stations, and media servers. If you connect to a backbone, ensure it is Gigabit, to handle the real-time traffic. Make certain that switches do not have a firewall, and that TCP and UDP ports 7000/7002 (video), 7004/7006 (audio), 7008/7010 (status), 554 (RTSP), and 80 (http) are open.

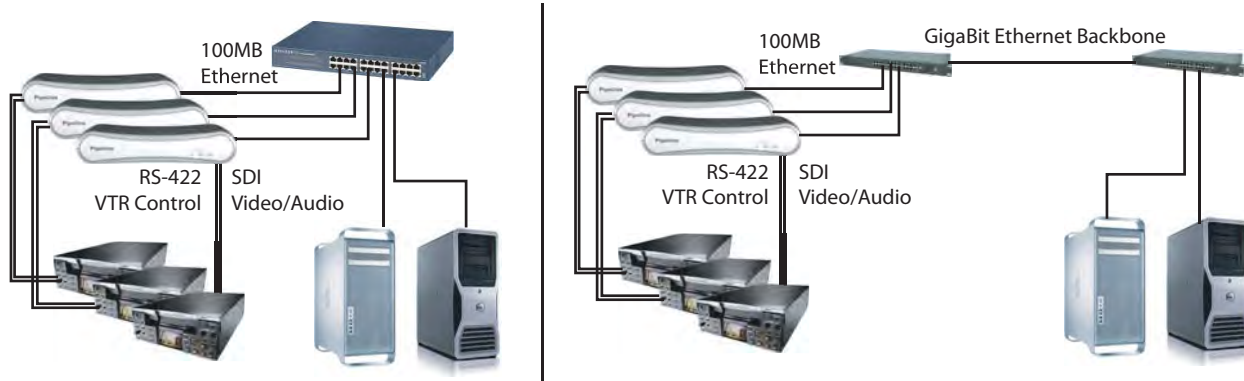
Each Pipeline SC is assigned a unique, automatically assigned, link-local IP address in the range 169.254.1.0 to 169.254.255.255, so that it can communicate directly with your computer without a gateway. Each of the Pipelines (*channels*) in a Pipeline HD Dual and Pipeline Quad is assigned an incremental IP address.

You can also set up the Pipeline with a static or DHCP address. Make IP address modifications with Pipeline Direct, a Web application built into each Pipeline ([Using the Configure Panel on page 44](#)).



Use these instructions to make power, Ethernet, and video connections to one or more Pipelines when connecting it to a LAN where FlipFactory server or Final Cut Pro editing stations are located.

Figure 2–9. Pipeline video, VTR control & network LAN connections



1. Make sure the Pipeline is not plugged in.
2. Connect the Pipeline Ethernet port to a network switch with an Ethernet cable on the same LAN as your Final Cut Pro editing station or FlipFactory server.
3. Connect each Pipeline SDI IN port to an SDI source such as your VTR or SDI router with a BNC cable.
4. (Optional) Connect each Pipeline's RS-422 port to an RS-422 control, such as your VTR.
5. (Pipeline Quad – Optional) Connect video equipment to your Sync In and Sync Out video ports.

POWERING UP THE PIPELINE

For Pipeline SC, plug the Telestream-supplied power adapter jack into the power port on the back plane, and then connect the power cord to an AC source (or power converter) to power the Pipeline on.

For Pipeline HD Dual and Pipeline Quad (with redundant power supplies) plug both Telestream-supplied power cords into the power plugs on the back plane, and then connect each power cord to an AC source (or power converter) to power the Pipeline on.



CONFIGURING & CONNECTING TO PIPELINES

As with other network devices, each Pipeline has a fixed MAC address and a default IP address, which you can change. Before using Pipeline, you'll need to contact your IT administrator (especially when connecting to a LAN) to determine which IP address and net mask to use for each Pipeline and how to set it up (automatic link-local, DHCP, or static), based on your facility's network address policy.

Configuring Pipeline Network Settings

To view and modify the Pipeline's network configuration, log on and display the Configure panel (click Configure in the toolbar at the top of Pipeline Direct). See [Using the Configure Panel on page 44](#).

After plugging the Pipeline into the network and powering it on, you can connect to Pipeline via Bonjour, or you can use the Pipeline's default IP address.

When you connect, Pipeline Direct displays in your browser. For details on using Pipeline Direct, see [Chapter 5, Using Pipeline Direct on page 39](#).



Note

Pipeline is a shareable, network device. You can log onto a Pipeline with Pipeline Direct anywhere on your network, via a Web browser. However, only a single user can log on and use the Pipeline at a time. If Pipeline displays the "Pipeline in Use" message in the video panel, you should close the application without performing any tasks to avoid interrupting someone else's Pipeline session.

Installing Bonjour for Windows

Bonjour is a service discovery system from Apple, Inc. Bonjour is integrated in Pipeline and FlipFactory, and most network printers as well, as a means of easily identifying and connecting to network devices.



Note

To determine if Bonjour for Windows is installed, run Internet Explorer and select View > Explorer Bar. If the Bonjour panel is not listed, Bonjour is not installed.

If the Bonjour panel is selected and displays the message "Bonjour Service Not Available", the service is stopped. Go to start > Control Panel > Administrative Tools > Services. Right-click Bonjour Service and select Start from the menu to start the service.

Bonjour is installed in FlipFactory 6.0 and later by the FlipFactory installer, but the service is turned off. FlipFactory installation includes starting the Bonjour service.

If you plan to use Pipeline on a Windows computer and Bonjour for Windows isn't installed, install it now:

1. Insert the Pipeline CD into your workstation.
2. Run the installer from the CD menu and follow the installer instructions to install Bonjour. (Bonjour-Setup.exe is in the Files/Utilities directory.)
3. When you're done installing Bonjour, eject the CD and store it in a safe place.



Connecting to Pipeline via Bonjour

In addition to an IP address, each Pipeline has a Bonjour-friendly name:

- Pipeline SC default: Pipeline_XXXX where XXXX is the serial number
- Pipeline HD Dual default: PipelineHDDualXXXX_N where N is device number 1 or 2.
- Pipeline Quad default: PipelineQuadXXXX_N where N is device number 1, 2, 3, or 4.

You can use this name to use Bonjour to identify Pipelines on a network and connect.

To connect to a Pipeline using the Bonjour panel (not available to Firefox users), follow these steps:

Internet Explorer (Windows)

1. Open Internet Explorer and select View > Explorer Bar > Bonjour to display the Bonjour panel.
2. Select the Pipeline in the panel to log on and display Pipeline Direct.

Safari (Mac OS X)

1. Open Safari and select Bookmarks > Show All Bookmarks.
2. In the Collections panel, click Bonjour.
3. Select the Pipeline from the list to log on and display Pipeline Direct.

Firefox (Windows | Mac OS X)

1. Open Firefox and enter the IP address (*http://169.254.1.0*, for example) – Bonjour is not supported.
2. Press Enter to log on and display Pipeline Direct.

Connecting via the Pipeline's IP Address

Each Pipeline from the factory is assigned a default, link-local IP address in the range 169.254.1.0 to 169.254.254.255. The factory-supplied IP address is printed on the bottom of Pipeline SC. On Pipeline HD Dual and Pipeline Quad, it is printed on the left side, when looking at the front of the device.

For Pipeline HD Dual, channel number 2 is incremented by one from the default address. On Pipeline Quad, channels 2, 3, and 4 are serially incremented by one from the default IP address of device 1 through 4. For example, if Pipeline 1 is 169.254.1.10, then Pipeline 4 is 169.254.1.13.

If the Pipeline's IP address has not been modified, you can identify Pipelines on a network and connect using an IP address by following these steps:

1. Identify the Pipeline IP address by viewing the label on the bottom of the device.
2. Open a Web browser and enter the URL in the form: *http://169.254.12.194*, replacing this sample IP address with the address of the target Pipeline. Press Enter to log on and display Pipeline Direct, authenticating if you've supplied a password on the Pipeline.





Note

In the unlikely event that you can't connect, try these steps:

Make sure the Pipeline is connected to a switch on your LAN and powered on, and the Power LED on the front is lit.

Ping the Pipeline using the IP address. If you can't ping it, there may be an IP address conflict, causing Pipeline to use a secondary address. Unplug the Pipeline and connect the Pipeline directly to a computer via an Ethernet cable, plug it in and ping it again.

If you're connected directly to a computer, but can't ping it, you may be using a standard Ethernet cable, but due to computer limitations, you need to use a cross-over cable.

If you can ping the Pipeline but still can't connect, you may have a firewall blocking the connection.

See Appendix A, TroubleShooting, for assistance.

REGISTERING YOUR PIPELINE WITH TELESTREAM

When the Pipeline is operational and you can connect via Pipeline Direct, register the Pipeline with Telestream – display the About panel and click the Register button. Follow the steps on the Web page to complete registration.

If the computer you're using is on a LAN without Internet access, use a computer that has Internet access and go to dynamic.telestream.net/pipeline-register/register.asp to register your Pipeline. You should register your Pipeline to ensure ongoing warranty service and customer service, per the terms of service.



CHAPTER 3

Installing Pipeline Software

Use this chapter to install, upgrade, or uninstall Pipeline software.

Topics

- [Installing Pipeline Software \(page 24\)](#)
- [Upgrading Pipeline Software \(page 24\)](#)
- [Removing Pipeline Software \(page 24\)](#)



Note

Telestream recommends that Pipeline Control be installed on a computer that is not hosting FlipFactory, Episode Engine, or other media processing applications: intense disk and CPU consumption can interfere with proper operation of both applications.

Be sure to review your platform, system and workflow requirements before installing Pipeline software ([Chapter 4, Implementing Pipeline Workflows on page 27](#)). When you install or upgrade Pipeline client software, you may have to upgrade the firmware revision in your Pipeline hardware.



INSTALLING PIPELINE SOFTWARE

Pipeline Control for Windows is distributed from Telestream's Web site (www.telestream.net) as an MSI file, and is also distributed on the Pipeline CD. After verifying that you have all of the required subsystems (below), download or open the installer and run it. Follow the steps to install Pipeline Control for Windows.

Pre-requisite Subsystems

These software subsystems are required before installing Pipeline software on Windows computers:

QuickTime

Pipeline Control requires QuickTime 7.5.5 or later. To install/update QuickTime, stop Pipeline installation. Install the new version from Apple's Web site (apple.com). Then, re-start the Pipeline Software installer.

Avid DNxHD Codec

Pipeline requires the DNxHD codec, available from Avid in the Avid Quicktime LE Codec package. Go to the [Avid QuickTime Codecs LE page](#). At the bottom of the page, locate the current version of the Avid QuickTime LE Codec package for Windows (PC) and download the zip file.

Extract the zip file to the desktop. Run AvidCodecsLE_1.8 (or current version) PC\AvidCodecsLE_Install\disk1 SETUP.EXE and follow the instructions to install the DNxHD codec.

Bonjour for Windows

Pipeline Control requires Bonjour for Windows. To install/update Bonjour, stop Pipeline installation. Obtain Bonjour for Windows from Apple's Web site (apple.com). Then, re-start the Pipeline Software installer.

.Net Framework 3.5 Service Pack 1

Pipeline Control for Windows requires .Net Framework 3.5 with Service Pack 1. If you need to install or update your version of .Net, stop the Pipeline installation process. Install or update .Net from Microsoft's Web site (microsoft.com). Then, re-start the Pipeline Software installer.

UPGRADING PIPELINE SOFTWARE

Pipeline software upgrades are periodically posted on the Flip4Mac Web site at www.telestream.net. On the Telestream site, click Support > Support Home, then select Pipeline under the Pipeline section – Pipeline software updates are displayed in the left column.

Before running the installer, be sure to remove the previous version of Pipeline, using Add/Remove Programs in Control Panels. Then, follow the instructions in Installing Pipeline Software (above) to upgrade your Pipeline software.

REMOVING PIPELINE SOFTWARE

To uninstall Pipeline Control, display Control Panel > Add/Remove programs. Select Pipeline and click Remove. Removing the Pipeline application does not remove any schedules you've made, or any media you've saved on the computer from which you are removing Pipeline Control.



CHAPTER 4

Implementing Pipeline Workflows

To implement Pipeline workflows which capture or play out media on Mac OS X or Windows, you'll need to install Pipeline software. Use this chapter to determine your workflow and system requirements, and to install, upgrade, or uninstall Pipeline software.



Note

Telestream recommends that Pipeline Control be installed on a computer that is not hosting FlipFactory, Episode Engine, or other media processing applications: intense disk and CPU consumption can interfere with proper operation of both applications.

When you install or upgrade Pipeline client software, you may have to upgrade the firmware revision in you Pipeline hardware.

Topics

- [Pipeline Application Feature Comparison \(page 28\)](#)
- [Workflow System Requirements \(page 29\)](#)
- [Typical Pipeline Systems and Considerations \(page 29\)](#)
- [Disk Requirements For Media Files \(page 33\)](#)
- [Platform and System Requirements \(page 35\)](#)
- [Network and Hard Disk Performance Requirements \(page 36\)](#)
- [Hardware Recommendations for Ingest Processing \(page 37\)](#)



Note

If you haven't installed the Pipeline yet, proceed to [Chapter 2, Pipeline Hardware, Installation & Setup on page 5](#) before continuing.

Before you use a Pipeline to capture and play out media, the device must be configured using Pipeline Direct ([Chapter 5, Using Pipeline Direct on page 39](#)).



PIPELINE APPLICATION FEATURE COMPARISON

Pipeline software includes three applications – Pipeline Control and Pipeline Plugin for Episode and Final Cut Pro, compared below. Pipeline Direct, a Web app directly in Pipeline, provides limited functions.

Pipeline Control. Pipeline Control is available for Mac OS X, Windows XP, and Vista Ultimate. You can use Pipeline Control to capture or play out media from/to Pipeline SC, Pipeline Quad, and capture from Pipeline HD Dual on a 24-hour schedule. You can also use Pipeline Control for scheduled capture and playout, triggered manual and automated capture, log & capture, and print to tape operations – without requiring Final Cut Pro or Episode.

Pipeline Plugin for Final Cut Pro and Episode | Episode Pro. Pipeline Plugin provides some of the available in Pipeline Control.

Table 4–1. Feature comparison of Pipeline client applications

Pipeline Software Features	Pipeline Control (Windows)	Pipeline Control (Mac OS X)	Pipeline Log & Capture Plugin
Supports Pipeline HD Dual	✓	✓	✓
Supports Pipeline SC and Pipeline Quad	✓	✓	✓
24-hour recurring record	✓	✓	
24-hour recurring playout		✓	
Log & Capture with deck control	✓	✓	✓
Triggered manual and automated capture	✓	✓	
Print to Tape – Insert Edit	✓	✓	✓
Print to Tape – Assemble Edit	✓	✓	✓
Print to Tape – Crash Playout	✓	✓	
Web Service API	✓	✓	
Open directly from Final Cut Pro			✓
Open directly from Episode Desktop			✓
Edit while capturing	✓	✓	
Transcode while capturing (FlipFactory Episode Engine)	✓	✓	
Import Pipeline G4G EDL files	✓	✓	✓
Import Export Final Cut Interchange files	✓	✓	✓
Create QuickTime Open files directly	✓	✓	
Create QuickTime Closed files directly	✓	✓	✓
Create TIFO files directly	✓	✓	
Create Avid AAF/MXF OPAtom files directly	✓	✓	
Create Generic MXF OP1a files with with DV DVCPRO IMX video essence	✓	✓	



WORKFLOW SYSTEM REQUIREMENTS

Pipeline applications can be used with these versions of FlipFactory, Final Cut Pro, and Episode:

- FlipFactory 6.0 with Service Pack 5, FlipFactory 6.1, and 7.0.
- Episode Engine version 5.0 or greater
- Final Cut Pro Version 5.1.4 or newer

TYPICAL PIPELINE SYSTEMS AND CONSIDERATIONS

Pipeline System Architecture

Pipeline is a unique, network-based media-encoding hardware device, that can be used in a variety of capture and playout workflows. Because it is a network-based device, several constraints should be understood in order to configure an efficient and reliable Pipeline system workflow.

Pipeline-based capture workflows consists of compressing baseband HD/SD-SDI input, and creating a file on a host computer that contains the compressed data, and saving the completed file on disk. A typical Pipeline system consists of one or more Pipelines connected via CAT6 Ethernet to a host computer.

When activated, Pipeline digitizes (compresses) input video and streams the compressed data out the Ethernet port using Real Time Streaming Protocol (RTSP). Each Pipeline channel's RTSP stream contains video, audio and control data in RTP transport packets. Each stream is ingested by a Pipeline control application running on a host computer. The application wraps each RTSP stream into the appropriate file wrapper and saves it in a file.

The key components of a Pipeline workflow are the network, the Pipeline device itself, a Pipeline control application, and media storage systems.

A Pipeline host system can control multiple Pipeline channels concurrently. Pipeline applications perform many tasks, including scheduled capture and playout, log/capture from tape sources, manual and automated capture from live sources and print to tape/playout functions.

Pipeline applications also provide interfaces to (or within) video edit software, FlipFactory, Episode Engine, Episode Desktop, instant messaging software, and disk file systems.

Video and Audio Preview Implications During Capture

The most CPU intensive operation during a Pipeline capture session is projecting video and audio preview streams. In most cases, previewing multiple streams when capturing standard definition media will not affect the overall performance of your Pipeline capture system. However, two or more high definition preview streams may cause excessive CPU load and prevent critical real-time media processes from being serviced in a timely manner, leading to data loss and integrity of the resulting media file. Telestream recommends that you view only one HD preview stream at a time on a multi-stream HD capture system.

Best Practices for Networking Pipelines

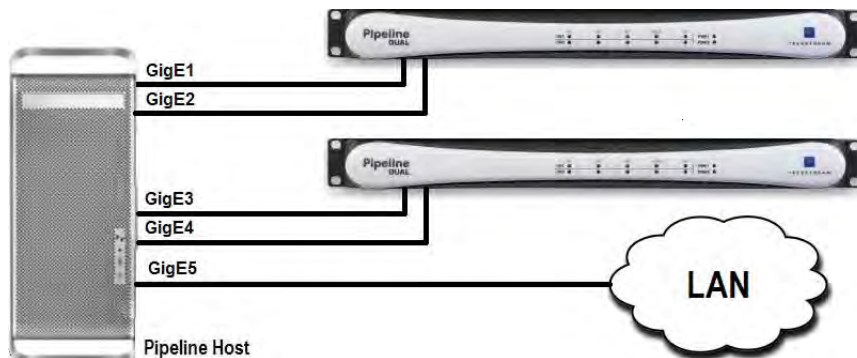
For best results, Pipelines should be connected directly to the Pipeline's host system, as shown in the graphic following, depicting two Pipeline Quads connected directly to the Pipeline host, for an 8-channel SD workflow. Pipeline devices can be connected to network switches, however, multiple hops via routers and switches increases the risk that video frames will not be processed in a timely manner, resulting in lost frames. Special care must be taken to insure that real-time processes are executed in a timely manner.



Other network processes can consume significant bandwidth which may cause Pipeline real-time streams to be interrupted. When constructing a Pipeline system utilizing an existing information network, be aware of any local processes using the network that could affect the Pipeline traffic.

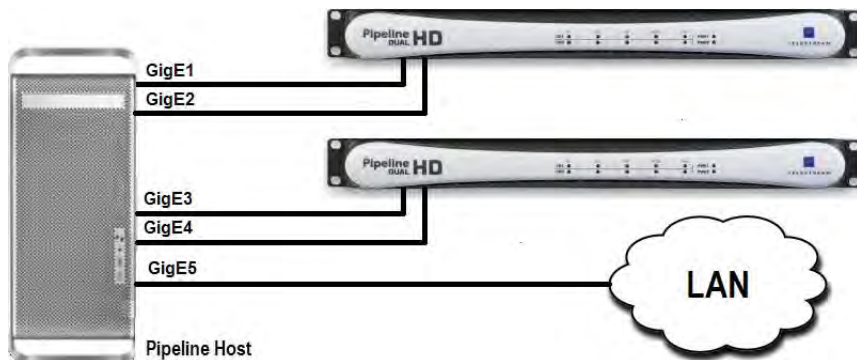
Best practices suggest that you separate Pipeline network traffic from other traffic by using a second, dedicated network adapter. Design your system with one (or more) Ethernet ports dedicated to the incoming Pipeline streams and with separate Ethernet port(s) for general data and media storage traffic.

Figure 4–1. Best practices – connect Pipelines directly to the Pipeline host.



As a rule of thumb, don't exceed 50% usage of any single Ethernet port or switch. For example, when capturing Pro Res 422 HQ at 220Mbps, use one GigE Ethernet port per channel (Figure 4–2), where two Pipeline HD devices are connected directly to the host using an Ethernet port for each channel. Multiple port Ethernet cards, such as those from Small Tree Communications, are ideal for this purpose.

Figure 4–2. Best practices – connect each channel directly to the Pipeline host.



Storage Requirements for Typical Workflows

When determining your storage requirements, there are two main factors to consider – the overall sustained read/write performance required, and if local data buffering is required.

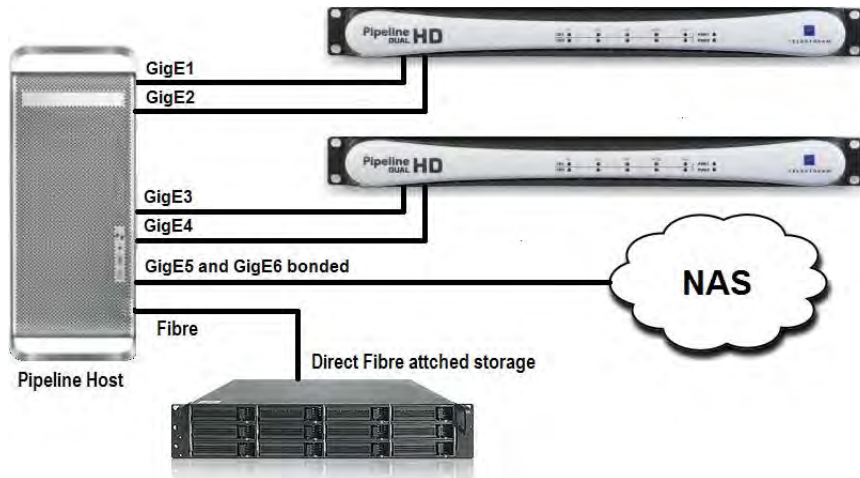
To evaluate your requirements, first consider the data rate for the format that you'll be encoding and the number of concurrent streams the system is expected to capture. [Network and Hard Disk Performance Requirements \(page 36\)](#) provides approximate data rates for a variety of formats and resolutions. Use this information to calculate the overall read/write performance requirements for your main storage system and, if needed, for disk buffer storage.



Capture-only Workflows

For capture-only workflows, when writing to internal or direct attached (non-shared) RAID arrays, you only need to calculate the overall write speed requirements. Configure your media storage array based on the write performance required for the number of streams being captured.

Figure 4–3. Configuration for capturing 4 HD streams onto Fibre-attached storage.



Concurrent Edit/Transcode Workflows

For capture with concurrent edit or transcode workflows, calculate the total read/write speed requirements based on the write processes of Pipeline streams and read processes for edit and transcode operations.



Note

Disk buffering is required when the destination path is located on a NAS, shared storage device, shared network folder, or when edit/transcode while capture operations are to be performed on the incoming Pipeline media files.

Some format wrappers do not support this feature. Take special care when writing these file types to shared disks.

To guarantee error-free operations you must use disk buffering. Use an internal or direct-attached non-shared RAID array that meets the read/write performance requirement ([Disk Buffering Details on page 34](#)).

Pipeline's media storage location (NAS, direct-attached shared storage, or shared network folder) must also meet certain read/write performance requirements. When using NAS, direct-attached shared storage or shared network folder, be sure to verify that your system has the communications bandwidth for writing all Pipeline media data to the media storage location in real-time.

For SD, we recommend that the host's disk storage system provide and maintain a sustained 10 MB/sec. transfer rate per stream from the Pipeline host computer to the media disk (read/write).

For DVCPRO HD, ProRes 422 and standard quality DNxHD, we recommend that the Pipeline host's disk storage system provide and maintain a sustained 40 MB/sec. transfer rate per stream from the Pipeline host computer to media disk (read/write). For ProRes 422 HQ and high quality DNxHD, Telestream recommends at least a 50 MB/second sustained transfer rate.



Capture Workflows Utilizing NAS|Direct-Attach Storage|Network Folders

For capture writing to NAS, direct-attached shared storage or shared network folder, you should enable Pipeline disk buffering ([Disk Buffering Details on page 34](#)).



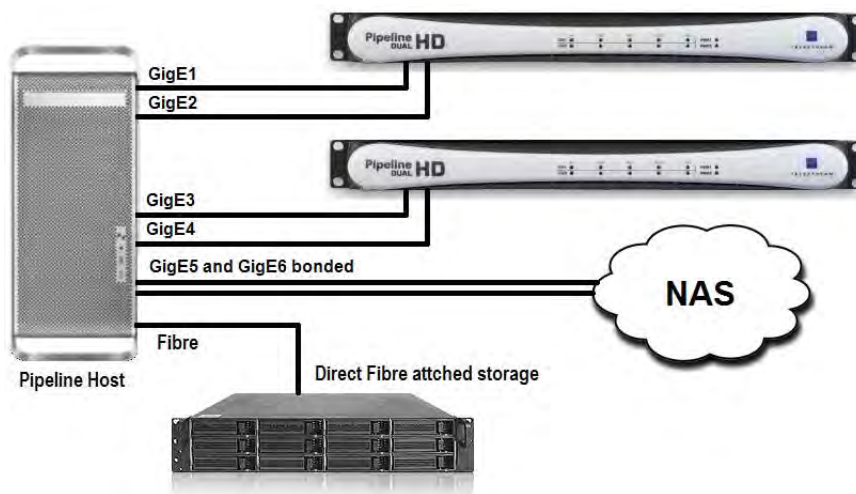
Note

Disk buffering is required when the destination path is located on a NAS, Shared Storage device, a shared network folder, or when edit/transcode while capture operations are to be performed on the incoming Pipeline media files.

Some format wrappers do not support this feature. Take special care when writing these file types to shared disks.

Disk buffering requires a separate RAID array to guarantee error-free write operations of media streams.

Figure 4–4. Configuration for capturing 4 HD streams onto NAS with Fibre-attached buffer space.



When calculating disk buffer RAID array read/write performance requirements, you should use two times the required Pipeline streams write requirements. This is required to support a write and a read operation on the data buffer array for each Pipeline stream.

The Pipeline's media storage location (NAS, direct-attached shared storage or shared network folder) must meet the write performance requirements. When using NAS, direct-attached shared storage or shared network folder, be sure to verify that your system has the communications bandwidth for writing all Pipeline media data to the media storage location in real-time.



DISK REQUIREMENTS FOR MEDIA FILES

Pipeline Control creates media files during log and capture, or when executing capture schedules. When using a schedule, clip events are created when a clip is ready to be captured. You can capture media in QuickTime files, Avid MXF, and TIFO ([Telestream Intermediary Format \(TIFO\) on page 66](#)) files, and they increase in size as the media is ingested and written to disk. Conflicts and problems can occur if you don't plan for disk requirements when capturing media.

If you have two or more schedules (either capture or playout) with the same storage location open in Pipeline Control and you activate both of them, the second schedule displays a store conflict error. You must select a different storage location before you can activate it. This doesn't prevent you from creating a store conflict by using the same storage location in two different instances of Pipeline Control on the same (or different) computer. This situation should be avoided, because it may result in file name conflicts.

When you activate a Capture schedule, Pipeline Control checks on the space requirements based on the clip events in the schedule. Telestream recommends that when you create a new schedule, you determine that the selected store has adequate available space.



Note

If Pipeline Control fails during capture and you are using disk buffering, on Mac OS X you should reboot to delete temporary media files that may be stored in the standard Unix temporary directory (default: /tmp).

On Windows, empty your disk buffering directory (default: <boot disk>:\Documents and Settings\<current user>\Local Settings\Temp\).

Media File Creation is Disk-Intensive. File capacity and write speed requirements are based on how many clips you store, how many clips you capture at one time, and how large each file is. For example, If you create a schedule to capture DV files at 25Mbps, storage requirements exceed 300GB per schedule. Using DVCPro HD requires 1.2TB; Pro Res HQ/DNxHD 220 requires 2.2TB in a 24-hour schedule.

Make sure that your disk, RAID, or SAN write speed is capable of saving media fast enough to avoid lost frames, and that your computer, Xsan or network store has available space before running production schedules. (See [Platform and System Requirements on page 35](#)).



DISK BUFFERING DETAILS

When Disk Buffering is checked, video and audio data are written into a FIFO disk buffer file in a local folder before the data is written to the media file destination.

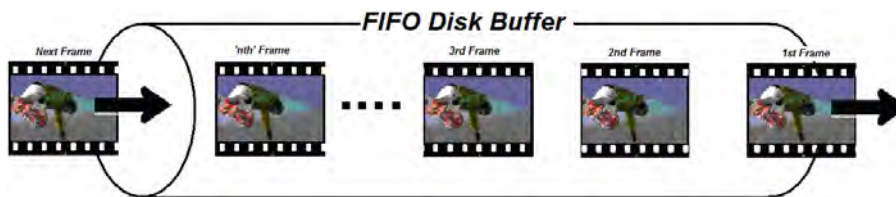


Note

Disk Buffering must be enabled when the destination path is a located on a NAS, Shared Storage device, a shared network folder, or when edit/transcode while capture operations are to be performed on the incoming Pipeline media files.

During capture operations, when the file destination drive's performance is reduced due to additional read processes (when performing transcoding, file editing or other disk-intensive activity), data is placed into the FIFO (First In, First Out) buffer.

Figure 4–5. FIFO disk buffering enhances file writing performance



FIFO buffer files are elastic and grow as needed when write performance is temporarily reduced on the media file destination disk drive. Disk buffering prevents the RAM buffer from overflowing when disk writes are temporarily blocked or performance is reduced on the media file destination disk.

The read/write performance for a volume used for disk buffering needs to be able to support the media format and number of channels being captured. As a rule of thumb, the buffer disk should be RAID-0 with the appropriate number of drives to support the read and write requirements for the number of channels with the respective media format used ([Network and Hard Disk Performance Requirements \(page 36\)](#)).

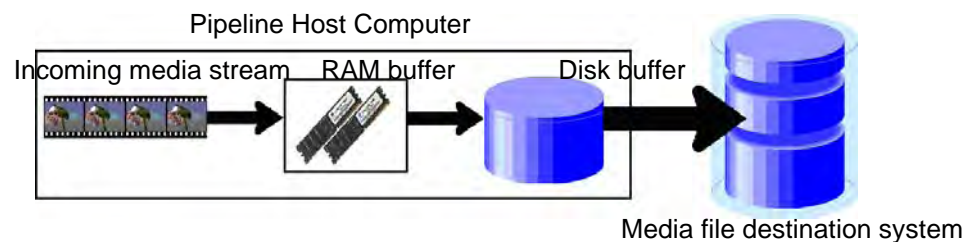


Note

The disk used for buffering should be used exclusively for Pipeline buffering. Using the disk buffer drive for other read/write processes may cause unpredictable results.

Enable Disk Buffering whenever your media file destination is not a local drive or array – such as a NAS, SAN, or shared network folder.

Figure 4–6. Pipeline buffering process





Caution

The disk selected for buffering should be used exclusively for Pipeline video/audio data buffering. Using the disk buffer drive for other read/write processes may cause unpredictable results.

Never write to a disk buffer that does not meet the minimum performance requirement for the number of channels and media format being captured. See [Network and Hard Disk Performance Requirements \(page 36\)](#).

The disk buffering drive must never be the same as the media file destination drive. This will result in doubling the amount of read and writes operations to this drive and will severely degrade overall disk performance.

When schedule events are touching (one file stops and the other starts at the same moment) and there is a handle setting of more than zero, the amount of data being processed and written to disk doubles for the duration of the handle.

Double capturing may result in data loss in workflows on slow computers, or in workflows with multiple simultaneous ingests, since the application may be pushing the limits of CPU capacity or disk write speed.

PLATFORM AND SYSTEM REQUIREMENTS

General Pipeline Host System Requirements

- CPU: Intel Core 2 Duo, Intel Quad Core, or greater
- Operating System:
 - Mac OS X Version 10.5 (Leopard) or 10.6 (Snow Leopard). Mac OS X 10.4 or earlier is *not* supported.
 - Windows XP Pro with Service Pack 2 or later or Windows Vista Ultimate.
- Video card supporting Quartz Extreme and OpenGL accelerated surfaces on Mac OS X
- GigE or faster Ethernet adapter
- QuickTime Version 7.5.5 or newer with ProRes decoder component
- Final Cut Pro Version 5.0.1 or newer is required when using Pipeline plug-in

System Requirements for FlipFactory Pipeline Workflows

FlipFactory supports workflows utilizing Pipeline SD systems.

- FlipFactory v6.0 with Update Packs 1-5 or FlipFactory v6.1
- Concurrent Pipeline ingest streams may vary depending on CPU and disk speeds
- Recommended server spec:
 - Dual 2.3Ghz (or higher) Intel Quad Core CPU
 - Dedicated RAID-0 media storage
 - 2GB RAM
 - Bonjour for Windows



NETWORK AND HARD DISK PERFORMANCE REQUIREMENTS

Network and disk speed requirements by media format, per stream:

Table 4–2. Disk and Network Requirements by Media Format

Codec	Disk Read/Write (MB/sec.)	Network Volume (Mb/sec.)
SD Codecs		
Photo Motion JPEG	0.75	8
DV/DVCPro	4.4	35
IMX30	5.3	43
IMX40	7	56
IMX50	8.3	67
ProRes 422	7.3	58
Uncompressed 8bit 422	22	175
HD Codecs (range based on codec / bit rate)		
DVCPPro HD	16.5	135
ProRes 422 HQ	10-36	62-240
DNxHD	10-36	62-240



HARDWARE RECOMMENDATIONS FOR INGEST PROCESSING

Each system should have media storage (internal or directly attached to the host system) with adequate storage to support 24 hours of captured media in the selected format. The media drive must be separate from the OS drive, and meet the specified minimum requirements. For edit-during-ingest and transcode-during-ingest workflows, increased I/O performance is required to support the additional read processes, and may require disk buffer cache drive system (see Pipeline User Guide disk buffering details).

Viewing HD preview streams causes high level CPU consumption, which may cause dropped frames. Telestream recommends that you turn off preview during HD capture operations.

To insure quality of service when writing to a NAS, share storage location or network share your Pipeline system must support disk buffering and have it enabled.

Minimum Hardware Configurations for SD Ingest Processing

Table 4–3. Hardware Requirements for SD Ingest Processing

Number of Channels	Hardware Requirements
Single channel system	Intel Dual Core 2.0Ghz CPU 2GB RAM Capture - Single 7200 RPM media storage drive Play Out - 2 drive RAID-0 media partition
Dual channel system	Intel Dual Core 2.0Ghz CPU 2GB RAM Capture - 2 drive RAID-0 media partition Play Out - 3 drive RAID-0 media partition
Four channel system	Intel Quad Core (4 core) 2.33Ghz CPU 4GB RAM Capture - 3 drive RAID-0 media partition Play Out - 4 drive RAID-0 media partition
Eight channel system	Intel Quad Core (8 core) 2.33Ghz CPU 6GB RAM Capture - 4 drive RAID-0 media partition Play Out - 5 drive RAID-0 media partition



Minimum Hardware for DVCPro HD Ingest Processing

Table 4–4. Hardware Requirements for DVCPro HD Ingest Processing

Number of Channels	Hardware Requirements
Single channel system	Intel Dual Core 2.53Ghz CPU 2GB RAM Capture - 2 drive RAID-0 media partition Play Out - 4 drive RAID-0 media partition
Dual channel system	Intel Quad Core (4-core) 2.8Ghz CPU 6GB RAM Capture - 4 drive RAID-0 media partition Play Out - 6 drive RAID-0 media partition
Four channel system	Intel Quad Core (8-core) 2.8Ghz CPU 8GB RAM Capture - 8 drive RAID-0 media partition Play Out - 10 drive RAID-0 media partition
Eight channel system	Intel Quad Core (8 cores) 3.0Ghz CPU 8GB RAM Capture - 8 drive RAID-0 media partition Play Out - 12 drive RAID-0 media partition

Minimum Hardware for DNxHD 220/ProRes HQ Ingest/Play out Processing

Table 4–5. Hardware Requirements for DNxHD 220/ProRes HQ Ingest Processing

Number of Channels	Hardware Requirements
Single channel system	Intel Dual Core 2.53Ghz CPU 2GB RAM Capture - 4 drive RAID-0 media partition Play Out - 6 drive RAID-0 media partition
Two channel system	Intel Quad Core (8-core) 2.8Ghz CPU 6GB RAM Capture - 6 drive RAID-0 media partition Play Out - 10 drive RAID-0 media partition
Three channel system	Intel Quad Core (8-core) 3.0Ghz CPU 8GB RAM Capture - 8 drive RAID-0 media partition Play Out - 12 drive RAID-0 media partition



CHAPTER 5

Using Pipeline Direct

Pipeline Direct is a Web application embedded in each Pipeline, which enables you to connect to Pipeline devices on your network with a Web browser.

You can use Pipeline Direct to perform administrative tasks on the Pipeline, including network configuration and firmware upgrades. With an attached VTR, you can also use Pipeline Direct to create EDL files from streaming media for submitting jobs to FlipFactory. Additionally, you can use Pipeline Direct to crash record SD media and save it as a TIFO file([Capturing SD Media to a TIFO File \(page 57\)](#)) for processing with FlipFactory or Episode | Episode Pro, or for conversion to QuickTime.

Topics

- [Supported Web Browsers \(page 40\)](#)
- [Launching Pipeline Direct \(page 40\)](#)
- [Using Pipeline Direct \(page 42\)](#)
- [Using the About Panel \(page 43\)](#)
- [Using the Configure Panel \(page 44\)](#)
- [Using the Quad Panel \(page 48\)](#)
- [Using the Counters Panel \(page 51\)](#)
- [Using the Live Panel \(page 53\)](#)
- [Live Panel Components \(page 54\)](#)
- [Capturing SD Media to a TIFO File \(page 57\)](#)
- [Using the Upgrade Panel \(page 60\)](#)



SUPPORTED WEB BROWSERS

You can use Pipeline Direct in the following browsers:

- Internet Explorer 6 or later on Windows (QuickTime is not required). Video preview utilizes an Active-X control which supports audio preview. May require security settings adjustments to install correctly.
- Safari Version 2 or 3 on Mac OS X with QuickTime 7.0.4 or later – no support for audio preview.
- Firefox Version 2 or later on Windows and Mac OS X – with QuickTime 7.0.4 or later for Mac OS X, or QuickTime 7.2 or later for Windows – no support for audio preview.



Note

Web browsers are supported only on the platform specified. You may encounter situations where features may not function correctly in all cases.

You can run Pipeline Direct from anywhere on your network. You can run it directly on a FlipFactory server, and save EDL and TIFO files locally in the target directory for FlipFactory's EDL monitor. You can also run Pipeline Direct on other computers, save files locally, then copy them to the target directory via Windows networking, or save them directly into a share.

Internet Explorer Settings for Pipeline Direct

To ensure that you can connect and use the Pipeline Direct application, make sure that Internet Explorer security settings are set as follows:

- Add Pipelines to your Trusted Intranet sites.
Click Tools > Internet Options. On the Security tab, click Trusted Sites. Then, click the Sites button and add `http://<IP address>` (`http://169.254.1.200`, for example) for each Pipeline. Make sure that you have unchecked the Require Server Verification option, because that requires an HTTPS connection and Pipeline communicates via HTTP. Click OK to close the dialog and continue.
- Click Default Level and drag the selector to Low. Click OK to update and close the dialog.
This setting enables Active-X Controls and plug-ins, automatic prompting for file downloads, and scripting of Java applets, which may also be set individually.

LAUNCHING PIPELINE DIRECT

To connect to a Pipeline and launch Pipeline Direct, follow these steps (if you've assigned a password to the Pipeline, you'll need to authenticate before you can connect – no password is required by default):

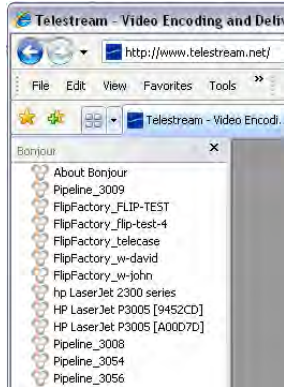
1. Launch your Web browser. (Bonjour is not supported in Firefox – connect using the IP address instead – skip to step 3.)
2. To connect using Bonjour, connect via:

Internet Explorer (Windows). Open Internet Explorer and select View > Explorer Bar > Bonjour (or click the Bonjour icon in the toolbar) to display the Bonjour panel on the left, and double-click the Pipeline in the panel to log on and display Pipeline Direct.



Safari (Mac OS X). Open Safari and select Bookmarks > Show All Bookmarks. In the Collections panel, click Bonjour. Double-click the Pipeline (under Web pages) in the list to log on and display Pipeline Direct.

Figure 5–1. Bonjour panel displays Pipelines on your LAN



3. To connect using the IP address, enter the IP address of the Pipeline in the URL field – *http://209.254.12.254*, for example – and press Enter to display Pipeline Direct:
4. The first time you connect to this Pipeline since starting the browser, if the Pipeline is password-protected (configure panel > Security), the browser displays a Pipeline Authentication dialog:

Figure 5–2. Connect dialog – enter your username and password to connect



Enter the username (administrator) and password if you added one, and click OK to connect.

5. Enter the username (always *administrator*) and password if you added one, to connect to the Pipeline and display Pipeline Direct.

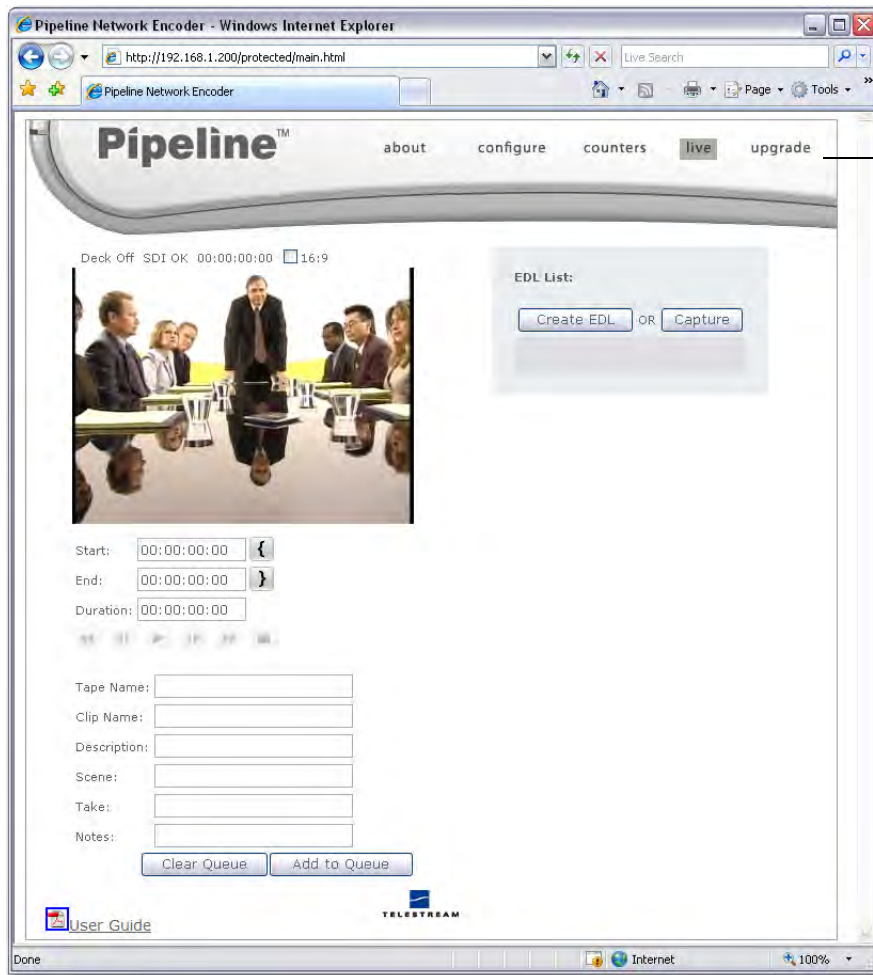


Note

The first time you connect to a Pipeline via Internet Explorer, a Pipeline Active-X control must be installed. Depending on your settings, you may or may not be required to OK this installation



Figure 5–3. The Live panel displays by default when you connect to a Pipeline.



To display the Bonjour panel, select View > Explorer Bar > Bonjour. Then, double-click the Pipeline you want to use.

Pipeline Direct has a menu bar at the top – just click an item to display its panel.

Whenever you connect to a Pipeline and display Pipeline Direct, the Live panel displays by default.

USING PIPELINE DIRECT

Pipeline Direct has several panels you can use to perform various tasks:

- **Using the About Panel** – provides general information about Pipeline, and registration.
- **Using the Configure Panel** – displays Pipeline and network settings, allows you to change network settings and options.
- **Using the Quad Panel** – displays when connected to a Pipeline Quad, to control confidence monitoring.
- **Using the Counters Panel** – displays statistical information about Pipeline activity.
- **Using the Live Panel** – displays streaming media, provides VTR control, and enables you to create EDLs for submitting media to FlipFactory for transcoding.
- **Using the Upgrade Panel** – enables you to upgrade the firmware and Pipeline Direct.

You can access to the Pipeline User's Guide (the document you are currently reading) from each panel by clicking the User's Guide link at the bottom of each panel.



USING THE ABOUT PANEL

To display the About panel, click **about** in the menu bar at the top of the window:

Figure 5–4. The About panel displays a link to product registration.



Register the Pipeline by clicking the Register button. Follow the steps on the Web page to complete registration. If you've already registered this Pipeline, the Register button no longer displays.

If the computer you're using is on a LAN without Internet access, use a computer that has Internet access and go to dynamic.telestream.net/pipeline-register/register.asp to register your Pipeline. You should register your Pipeline to ensure ongoing warranty service and customer support.

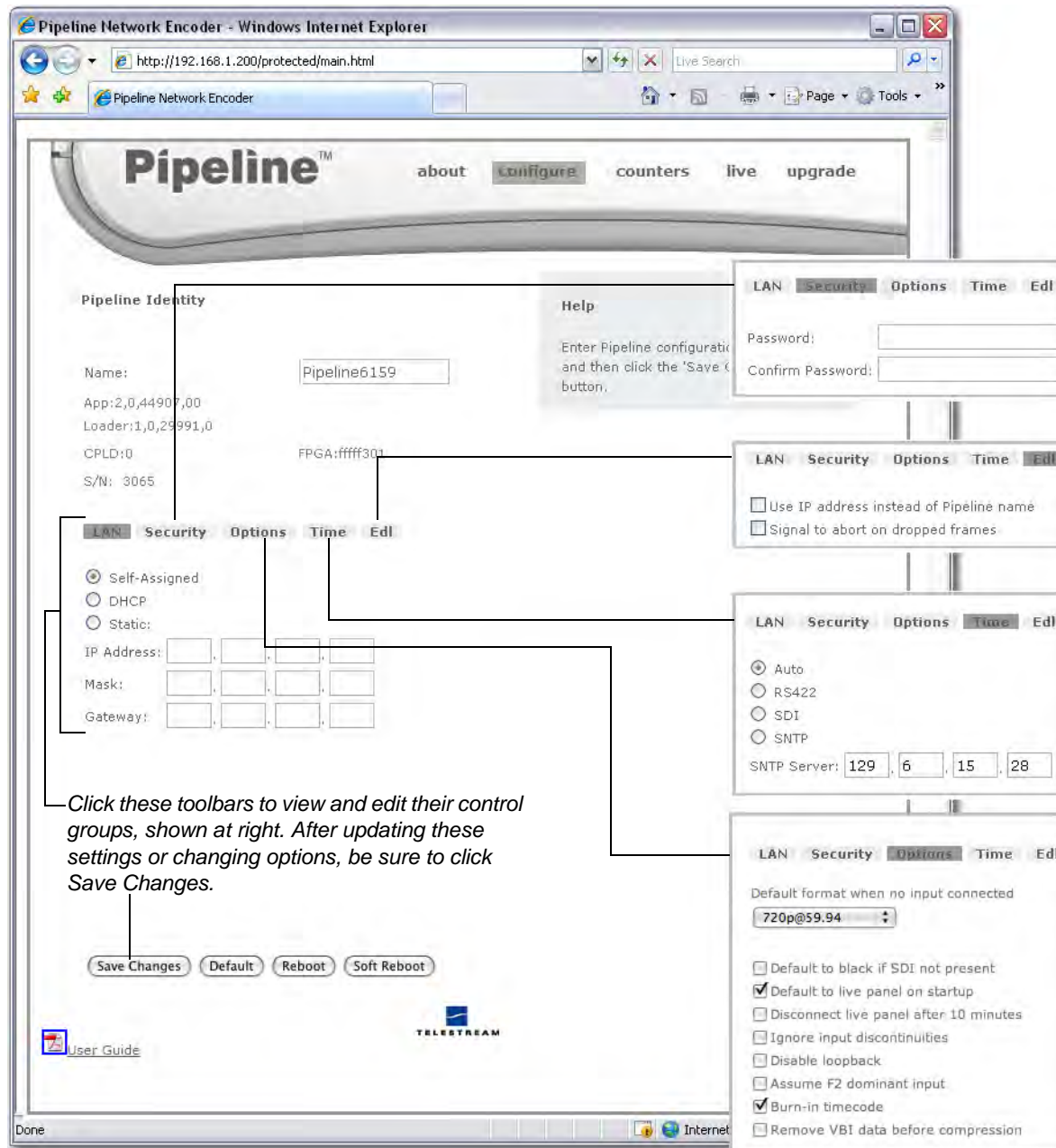
The About panel – as well as the other panels – provides online access to the Pipeline User's Guide (this document), by clicking the link in the lower left corner.



Using the Configure Panel

To display the Configure panel, click **configure** in the menu bar at the top of the window:

Figure 5–5. Configure panel displays details & allows you to change settings



Use the Configure panel to view and make changes to Pipeline's identity, IP settings, and options. Click the LAN, Security, Options, Time, and EDL toolbar to view their respective control panels, as shown in the callouts in the figure above. Each control is described in the following table:



Table 5–1. Configure Panel controls and descriptions.

Control	Description
Pipeline Identity	
Name	<p>Editable field. Default for Pipeline SC: <i>Pipeline-XXXX</i>, where <i>XXXX</i> is the serial number printed on the bottom of the Pipeline.</p> <p>Default for Pipeline Quad: <i>PipelineQuadXXXX_N</i> where <i>N</i> is the device number 1 through 4.</p> <p>Default for Pipeline HD Dual: <i>PipelineHDDual_XXXX_N</i> where <i>N</i> is the device number 1 through 2.</p> <p>To change the name, enter a new name, and click Save Changes. The name is updated in the Pipeline, and is reflected in the Bonjour panel. Limit: 255 characters.</p> <p>If you enter a friendly name that already exists, Pipeline adds (1), (2,), as necessary to maintain uniqueness.</p> <p>For best naming practices, you should identify the Pipeline model (SC or Quad), uniquely name it, and, in the case of the Quad, refer to the channel number. For example, <i>PipelineQuad_Prod7_Channel2</i>.</p>
App (firmware version)	<p>Displays Pipeline's firmware version number, composed of <Major Version>,<Minor Version><Build Number>,<Channel Number Identifier>. For example: 2,2,33165,00 indicates Version 2.2, Build 33165, channel 0. On Pipeline SC, the channel number ID is always 0. Upgrades are identified by major version and minor version numbers: 2.2, for example.</p>
Loader (version)	<p>Displays Pipeline's boot loader version number, composed of <Major Version>,<Minor Version><Build Number>,<Channel Number Identifier>.</p>
CPLD Version	CPLD chip version number on the Pipeline, for Telestream use.
FPGA	FPGA chip version number on the Pipeline, for Telestream use.
Serial Number	Four digit serial number of the device, not changeable.
LAN	
	<p>When changing the IP address, you should click Save Changes to update the Pipeline, then close Internet Explorer or Safari. Wait about 30 seconds, then restart your Web browser and log back on. If you don't, your Control application will behave incorrectly, and Pipeline Direct will periodically display an error: "Can't communicate with Pipeline".</p>
Self-Assigned	Select to utilize the default link-local IP address, generated based on the Pipeline's serial number; incremented on Pipeline 2, 3, and 4 on Quad.
DHCP	Select to have the DHCP server to assign an IP address. If DHCP fails after about 1 minute, the IP address reverts to the self-assigned address.
Static	Select to use the IP address, subnet mask, & gateway, entered manually.
IP Address	Enter the IP address assigned by your network administrator.
Mask	Enter the subnet mask assigned by your network administrator.
Gateway	Enter the gateway address provided by your network administrator.
Security	
Password	<p>Editable field. No password is assigned by default. (Username is always <i>administrator</i>.) Limited to 15 characters; standard HTTP password rules apply. May be empty to disable authentication.</p>
Confirm Password	Editable field. Enter second time to confirm.



Control	Description
Options	
Default format when no input connected	Select the default format from the menu. On HD Pipelines, you can choose an SD NTSC PAL or various HD 720 1080 profiles. On SC/Quad Pipelines, choose SD NTSC PAL.
Default to black if SDI not present	Pipeline generates a test pattern when no SDI input signal is present. If this option is checked the test pattern is a black frame, otherwise the generated test pattern is color bars. The pattern is generated in NTSC or PAL (or HD formats on HD Dual), based on the mode the Pipeline is in. The last valid SDI signal sets the mode.
Default to live panel on startup	When checked, Pipeline Direct displays the Live panel when it connects. If unchecked, the Configure panel displays.
Disconnect live panel after 10 minutes	When checked, streaming media is stopped after 10 minutes of inactivity. If unchecked, the live panel remains connected until the user navigates to another panel. While the Live panel is connected, other processes can not connect to the Pipeline. For example, a FlipFactory EDL monitor can not connect to process the EDL it has received.
Ignore input discontinuities	Unchecked by default, to insure capture quality. Check when you don't want Pipeline to report missing/partial frames in input stream during capture. This is useful if, for example, you're capturing from a satellite feed where errors occur more often and you don't want Pipeline to report the error to the Final Cut Pro plugin, because it will abort the capture.
Disable loopback	Prevents input SDI from being present on the output SDI during capture. Consider disabling when exporting to a deck and the deck complains about the reference signal.
Assume F2 dominant input	When checked, during encoding, Pipeline constructs a frame by using a field pair consisting of an F2 field followed temporally by an F1 field. This is in contrast to normal operation, which constructs a frame using a field pair consisting of an F1 field followed temporally by an F2 field.
Burn in Timecode	When checked, Pipeline overlays the timecode it is using as its primary clock on the video image.
Remove VBI data before compression	When checked, Pipeline strips each frame of VBI data, replacing it with black before passing it to the encoder for compression.
Time	
Time Sources (select one)	Select Auto, RS-422, SDI, Channel 1 (Pipeline Quad only) or SNTP. In Auto mode, Pipeline selects the timecode clock source by priority (see Table 6–6 on page 74 for Pipeline SC and Table 6–7 on page 74 for Pipeline HD & Quad). For Pipeline Quad channels 2, 3, and 4, you can select Channel 1 as the source. Channel 1 itself must be set to an external source. Note: Auto selection is ignored by the Pipeline Control application, whose schedule settings override those of the selected Pipeline.
SNTP Server	When SNTP is selected, edit field for entry of SNTP server IP address.



Control	Description
EDL	
Use IP address instead of Pipeline name	Check when you want communication to utilize the IP address of the Pipeline, instead of using the Pipeline name and resolving it via Bonjour.
Signal to abort on dropped frames	Check when you want FlipFactory to abort the capture process if a dropped frame occurs.
Buttons	If another user is connected and processing media with this Pipeline, using these buttons will interrupt the process, and it must be re-started.
Save Changes	Click to update the Pipeline with the new settings. If you change the IP address (by any means – returning to self-assigned, enabling DHCP, or assigning a static address), in about 30 seconds, Pipeline Direct displays an error: "Unable to communicate with Pipeline". Click OK, then reconnect to the Pipeline using the new IP address.
Default	Return settings to default. After returning the settings to default, be sure to click Save to make the settings take effect.
Reboot	This reboot performs a hardware-level reset, which disconnects Pipeline from any client which may attached without warning. Click to reboot the Pipeline if you change the password, to log on using the new password. You do not need to reboot when changing IP settings.
Soft Reboot	This reboot resets the Pipeline and any clients WILL lose their connection. Pipeline Direct displays an alert to warn you. In cases where the Pipeline is non-responsive, click Software Reboot to clear the problem.

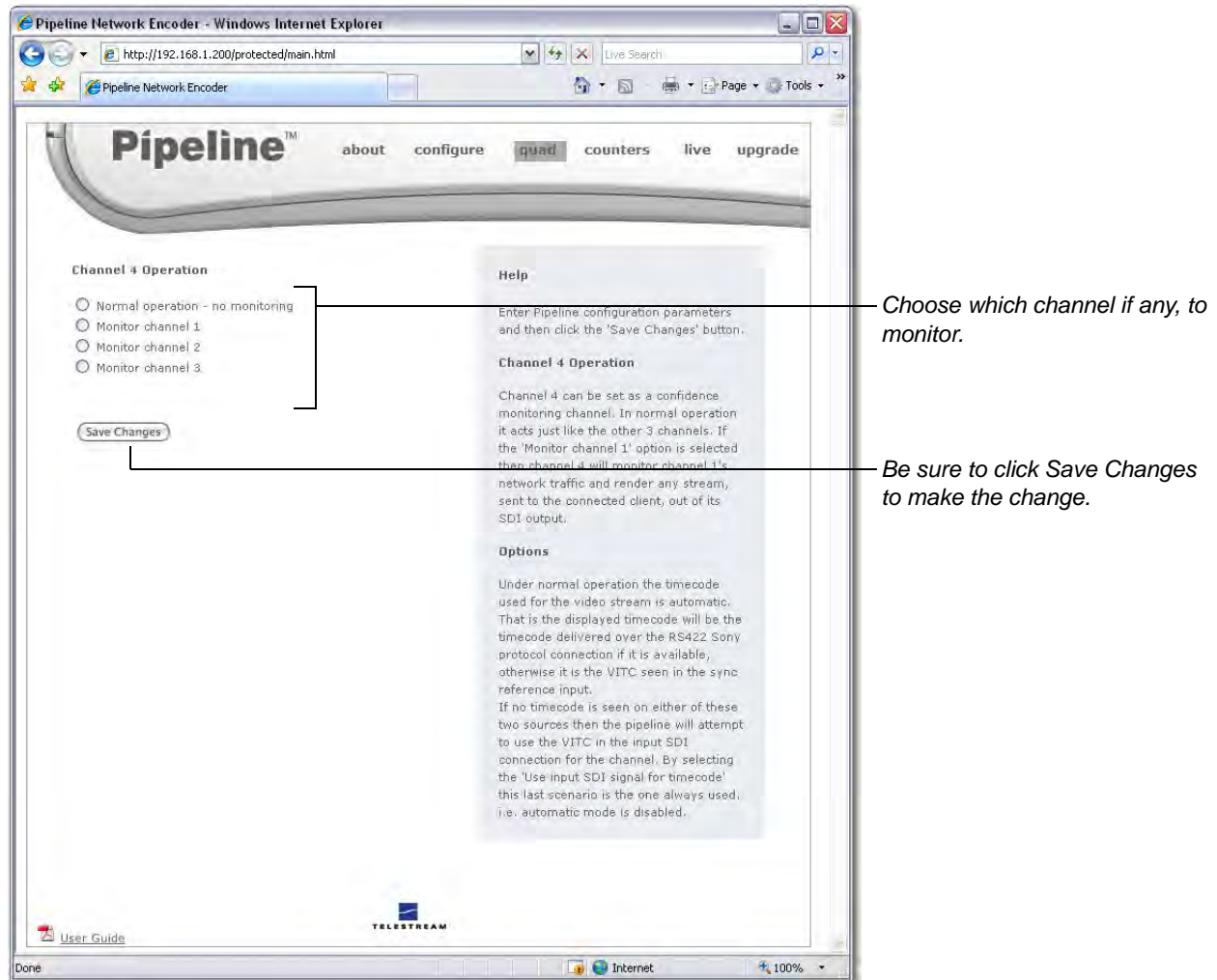


Using the Quad Panel

The Quad panel only displays when Pipeline Direct is connected to one of the Pipeline channels on a Pipeline Quad. When you're connected to any other Pipeline device, this page does not display.

To display the Quad panel, click **quad** in the menu bar at the top of the window:

Figure 5–6. Quad panel controls confidence monitoring



Use the Quad panel to set up confidence monitoring.



Table 5–2. Configure Panel controls and descriptions.

Control	Description
Confidence Monitoring	
Normal Operation – no monitoring	Check to disable confidence monitoring. When confidence monitoring is disabled, channel 4 (Pipeline 4 on the Quad) operates normally, and can be used for capture/payout operations. <i>Note: This option is only enabled when you log on to channel 4. You cannot make this change from other channels.</i>
Monitor channel 1 2 3	Check to enable confidence monitoring and encode and send the rendered stream of the selected channel on channel 4 SDI Out as well. Click Save Changes when you're done to update the settings.

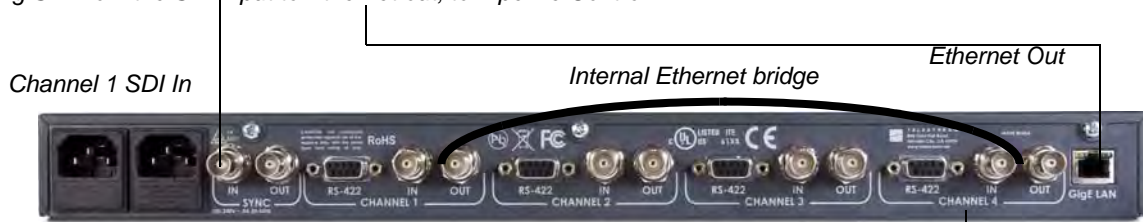
Confidence Monitoring

Confidence monitoring is the process of employing channel 4 on the Pipeline Quad to sniff the exact same video packets being captured from any of the other Pipeline channels on the Quad and processed by the client application during a capture operation (or crash recording), for the purpose of verifying that the output is a true representation of the input, or that the output meets certain quality limits or other metrics.

Confidence monitoring can be enabled when you are performing a capture operation or crash recording from channels 1, 2, or 3 on a Pipeline Quad. When enabled, Pipeline 4 is also dedicated to the capture operation for the duration of the capture operation.

Figure 5–7. Confidence monitoring is performed by channel 4 via internal Ethernet bridge

Pipeline Quad's Channel 1 is performing a capture operation – decoding SDI from the SDI Input to Ethernet out, to Pipeline Control.



Pipeline Quad

Confidence monitoring of channel 1 enabled.

Channel 4 is confidence monitoring channel 1 – sniffing the outbound traffic on the internal Ethernet bridge and re-encoding it, outputting the resulting SDI on SDI Out for review.

As SDI is being fed into the capture channel's SDI In port, it is encoded and sent out in TCP packets on the Ethernet port to the client application (Pipeline Control, Pipeline Direct, FlipFactory, Episode, Final Cut Pro, and other media systems). Unlike other confidence monitoring that just re-encodes the media directly in the same device, the channel 4 Pipeline sniffs the very same packets on the Ethernet just as the client does; it then decodes the Ethernet input, and outputs the resulting SDI on its own SDI Out port.



Operators can attach monitors and vector scopes to the SDI out to view and measure the actual media in a full-circle operation, confident that they are testing and viewing exactly the same input as the client system is receiving.



Note

To enable confidence monitoring, you must log on to channel 4 to display the enabled confidence monitoring option on the Quad panel. Channel 4 must be idle before you can enable confidence monitoring. You can confidence monitor both capture operations and crash recording operations.

When confidence monitoring is enabled and the preview media stream from the channel selected is being consumed by Pipeline Direct or in FlipFactory, the confidence monitor (channel 4 SDI Out) displays black. If the monitored channel's stream is DV, DVCPro, IMX, MPEG-2, or ProRes then the confidence monitor displays the full frame video as it is encoded.

If the monitored channel is not streaming media on the LAN, then the confidence monitor displays a banner on the image. The frame background is either the last frame of the previous stream or black.

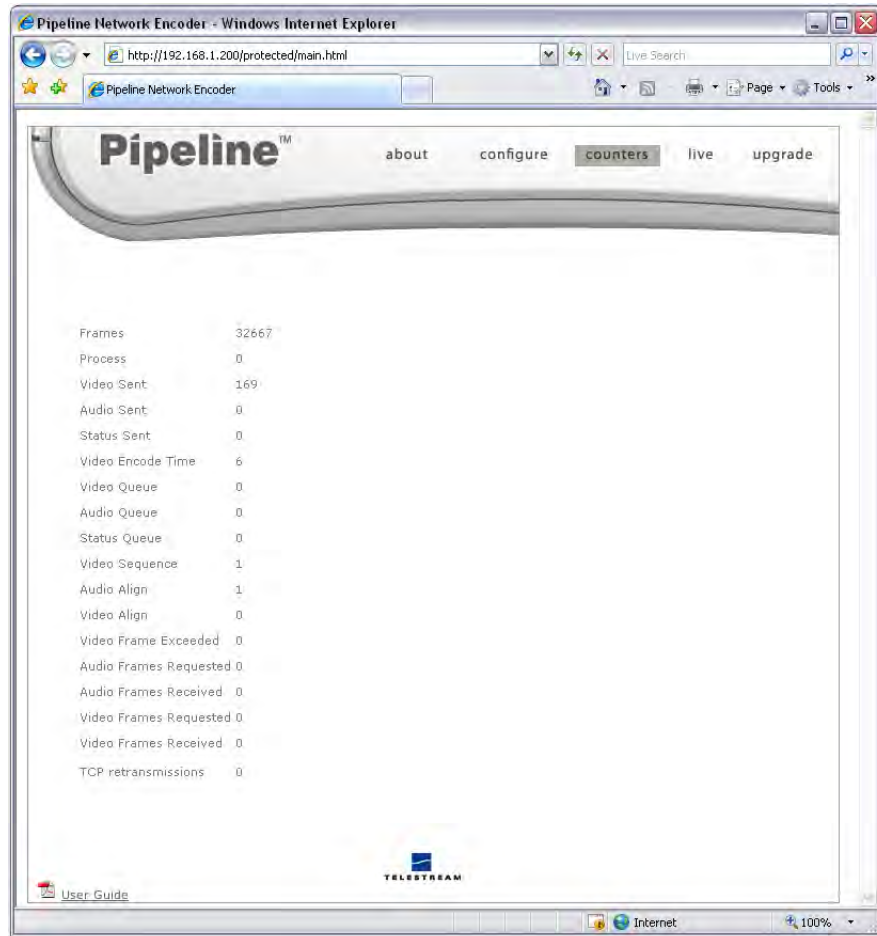
Figure 5–8. Confidence monitor displays a banner when no media stream is present



Using the Counters Panel

To display the Counters panel, click **counters** in the menubar at the top of the window:

Figure 5–9. Counters panel displays various processing values



Use the Counters panel to view various values related to encoding and decoding to determine if operations are normal or if there are failures that must be corrected. These values are reset each time a new RTSP connection is made. This information may also be utilized when you are working with Telestream Customer Service to resolve an issue.

Table 5–3. Counters Panel controls and descriptions.

Value	Description
Frames	The number of frames processed during this RTSP session.
Process	The number of frames dropped because of excessive CPU load. If this number is greater than zero, you're losing frames and quality. Determine the cause of the error and reprocess the media.
Video Sent	Number of video frames sent over RTP connection during an capture operation. Note: in TIFO mode, the Video Sent value counts both the video and audio frames sent, multiplexed over the same RTP connection.
Audio Sent	The number of audio frames sent during capture over RTP.



Value	Description
Status Sent	The number of status frames sent during capture over RTP.
Video Encode Time	Number of microseconds it took to process the current video frame.
Video Queue	The number of video frames dropped due to excessive network traffic. If this number is greater than zero, you're losing frames and quality. Determine the cause of the error and reprocess the media
Audio Queue	The number of audio frames dropped due to excessive network traffic. If this number is greater than zero, you're losing frames and quality. Determine the cause of the error and reprocess the media
Status Queue	The number of status frames dropped due to excessive network traffic.
Video Sequence	Count of frames where the timecode (as observed on the RS-422 connection) was not incrementally increasing.
Audio Align	Number of times the audio processor re-synchronized due to an Embedded SDI audio error.
Video Align	Number of times the video processor had to re-synchronize due to an SDI video error.
Video Frame Exceeded	CBR codec error counter.
Audio Frames Requested	During playout, Pipeline requests audio and video frames serially. This is the number of audio frames requested, and should be the same number as Audio Frames Received.
Audio Frames Received	Number of audio frames received during playout.
Video Frames Requested	Number of video frames requested during playout. Should be the same number as Video Frames Received
Video Frames Received	Number of video frames received during playout.
TCP retransmissions	Number of times TCP packets had to be retransmitted.



Using the Live Panel

To display the Live panel, click **live** in the menubar at the top of the window.

You'll spend most of your time here, especially when you're producing digital media with Pipeline for processing by applications including Final Cut Pro, FlipFactory, and others.

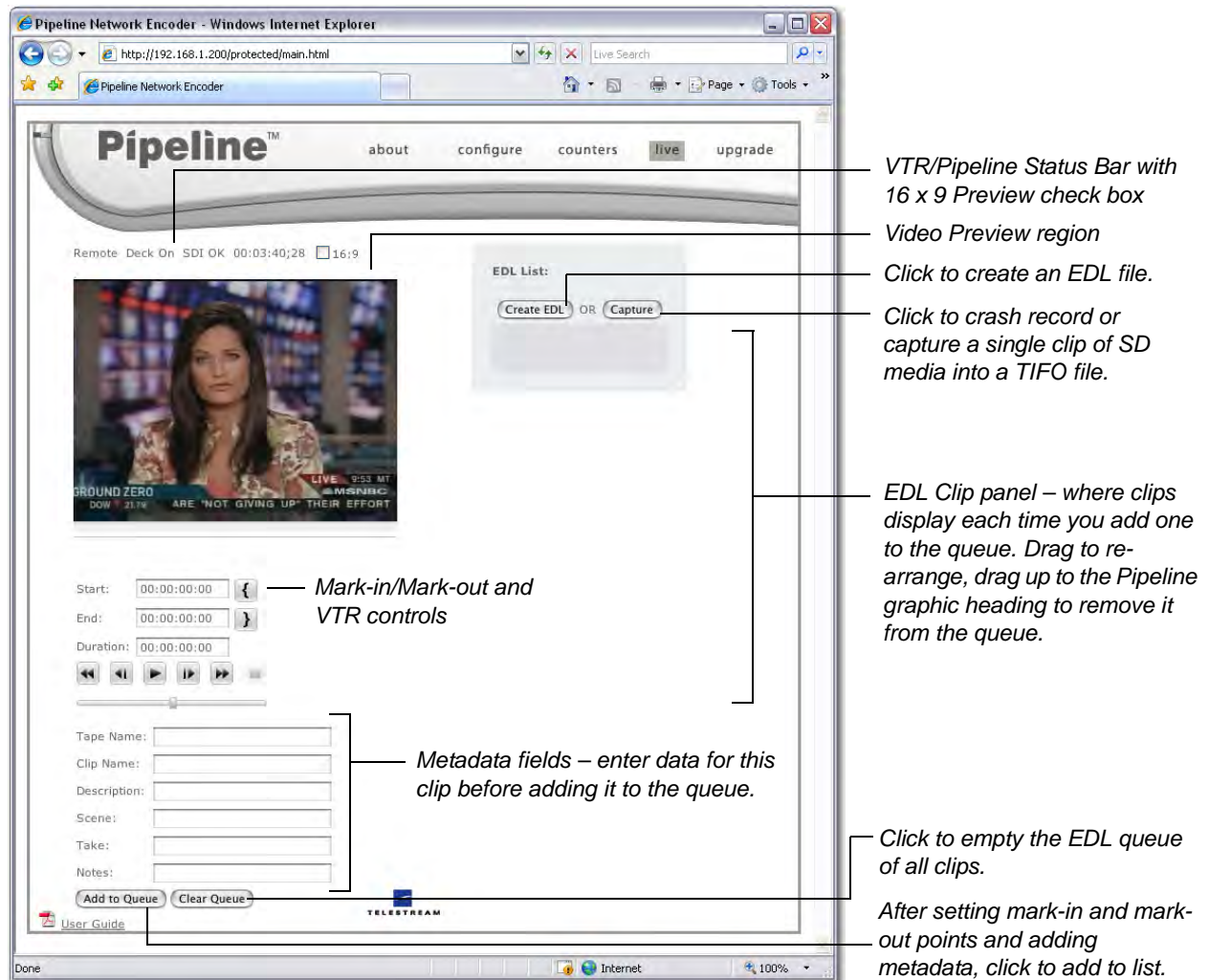


Note

You can only use the Live panel to capture SD media. If you want to capture HD media, you must use Pipeline Control.

When capturing or crash recording from channels 1 through 3 on a Pipeline Quad, you can perform confidence monitoring of the decoded SDI input to qualify your video. See [Confidence Monitoring \(page 49\)](#).

Figure 5–10. Live panel allows you to control the VTR and create EDLs



You use the live panel (which displays when you first connect) to view video streaming from the connected Pipeline, control a VTR, create and save EDL files, or crash record live feeds or video being played out from a playback device such as a VTR or VCR.



Note

Be sure to set your browser security settings to Low to use all features of this panel uninterrupted.

Live Panel Components

The components include: status bar, video region, VTR controls, metadata editor, EDL panel, and buttons for various tasks.

VTR/Pipeline Status Bar

Right above the video panel is a VTR/Pipeline status bar. It provides equipment status information at a glance:

VTR Mode. Local | Remote. If a VTR is connected via RS-422, displays the current mode of the VTR. In order to control the deck from the Live panel, the VTR must be in remote mode. When in local mode, the VTR controls are disabled. If the VTR is off or the RS-422 cable disconnected, this status is not displayed.

Deck Status. Deck On | Deck Off. If a VTR is connected via RS-422, advises if the VTR is on or off.

SDI Status. No SDI | SDI OK. If No SDI displays, indicates that there is no signal on the Pipeline SDI input port or there is no cable attached. When SDI OK displays, there is a valid SDI signal on SDI Input.

Timecode. The timecode reported from the VTR via the RS-422 port. When the VTR reports drop-frame timecode, the second/frame separator is a semicolon. For example: 00:29:30;16 is a drop frame timecode. Non-drop frame notation applies a colon between the second and frame values.

16 x 9. Check when video is 16 x 9 format for proper video display. Any EDL produced with this option checked will also set the ANAMORPHIC flag to TRUE:

*TELESTREAM_METADATA: ANAMORPHIC TRUE

This flag insures that anamorphic flags are set in appropriate output files in FlipFactory.

Video Preview Region

The video region displays streaming video when present, based on the status of your VTR controls, if active. If there is no SDI signal present, the preview region displays Bars and Tone or black (if Default to Black if SDI Not Present is checked in the Configure panel).




Note


In Internet Explorer (unlike Safari and Firefox), an Active-X player control is used for video and video control. The control supports audio preview, and some security adjustments may be necessary to properly install it.



VTR Controls

Start and End Timecodes. Timecodes that identify the mark-in and mark-out points on the current clip.

Click  to set the start, or mark-in point. You can also set the start timecodes manually (HH:MM:SS:FF).

Click  to set the end, or mark-out point. You can also set the stop timecodes manually (HH:MM:SS:FF).

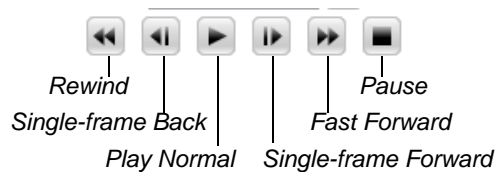
When the VTR reports drop-frame timecode, the second/frame separator is a semicolon. For example: 00:29:30;16 is a drop-frame timecode. Non-drop frame notation applies a colon between the second and frame values.

Use the VTR controls to adjust your timecode settings before setting them.

Duration. Timecode – difference between the mark-in and mark-out values of the clip you just marked.

VTR Controls. Use the VTR controls to control video preview when a VTR is attached. These controls are disabled if the deck is off, the RS-422 cable is disconnected, or the deck is in local mode. The scrubber bar, immediately below the VTR controls, displays when Pipeline is connected to a VTR deck with RS-422 control in remote mode.

Figure 5–11. The virtual VTR panel allows you to control the VTR and create EDLs.



Shuttle. Use the shuttle to quickly play through the content at different speeds, in fast and slow motion. It may shift the pitch of audio (Internet Explorer only) as it plays at varying speeds. Some decks don't play audio during shuttle or at certain speeds. In slow motion, this can make it easier to locate specific words and sounds for editing. Drag the slider to the right to fast-forward and to the left to rewind. Playback speed varies depending on the distance of the slider from the center of the control.

Clip Metadata. Enter text in these metadata fields for the current clip; stored with each clip and saved in the EDL for further processing. In Firefox and Internet Explorer, you can enter metadata information, and each time you create new mark-in/mark-out points and save the clip, the clip name increments by one.



Note

The default clip name is PipelineIngest_x. If you want the name to automatically increment, it must end in _# (underscore pound).

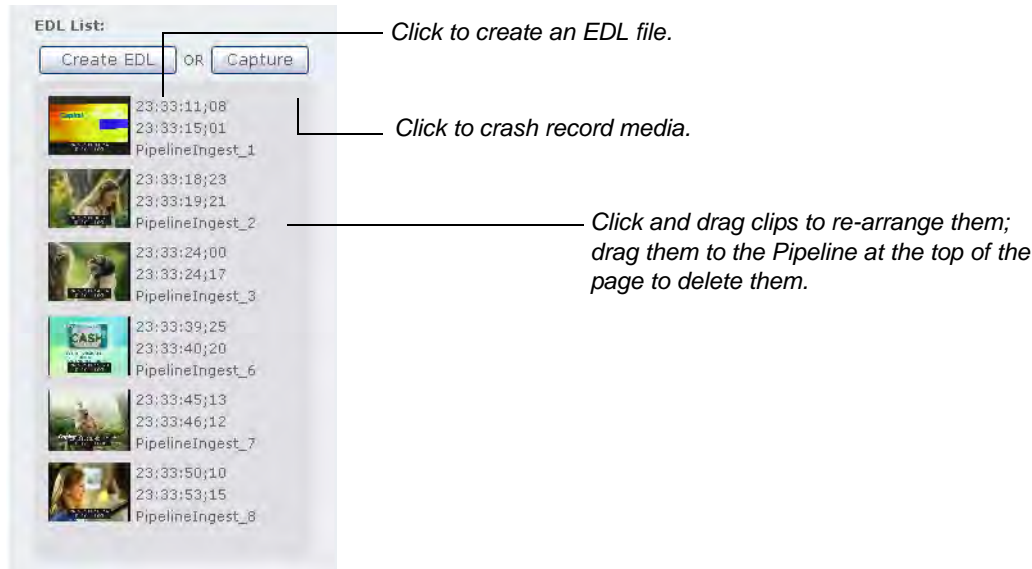
The information is stored in a cookie so it can be displayed in the metadata editor the next time you connect.



Edit Decision List Panel

Clip List. Displays each of the clips that are currently in the EDL panel.

Figure 5–12. The EDL panel displays clips you’ve marked, but not saved



To re-arrange clips in the list, click and drag a clip to the new location. To delete a clip, drag it into the Pipeline heading at the top of the page.

Task Buttons

Create EDL. Click to create an EDL file from the clips in the list. Pipeline displays a File Open dialog: you can click Open to view the EDL details, but to save them you must cut and paste them into a text file outside the browser, because the edit decision list is erased. Click Save to save the list in a folder.

When you create an EDL file, Pipeline Direct disconnects the video, audio, and data streams, so that FlipFactory (or other applications) can connect and process the media under control of the EDL file.

When the EDL file is saved in a target directory monitored by the EDL monitor, FlipFactory processes the file and submits a job for each clip. Each job is processed by processing each clip entry to produce a stream from the selected encoder. FlipFactory transcodes the stream in real-time to produce output based on your factory’s product settings. For details, see [Submitting Jobs Via an EDL Monitor on page 69](#).

Capture. Click to crash record live feeds or video played out from a playback device (a VTR or VCR). See [Capturing SD Media to a TIFO File on page 57](#). If you have a clip in the list, Capture produces a TIFO file from the clip – you can only capture clips in this manner when one clip is in the list. When you click Capture to crash record, Pipeline Direct disconnects the media stream from the Pipeline so that the process can connect and process the media, saving it in the TIFO file.



Note

Set your local intranet security settings to Low, to allow scripts to run and the browser to download files without intervention.



CAPTURING SD MEDIA TO A TIFO FILE

You can capture live standard definition feeds or video playing out from a playback device such as a VTR, by connecting your video into the Pipeline's SDI In port. Pipeline encodes the media and transmits it in real time to your PC via the LAN, where it is saved directly into a TIFO file under control of Pipeline Direct.



Warning

Capturing TIFO files from Pipeline Direct is not intended for critical production workflows. Dependence on non-real time Browser applications can present unforeseen issues, and can cause a loss of data and a significant risk of failure during capture.

When you're capturing media and no clips are in the clip list, you have control over the Pipeline via the VTR so that you can crash record the media playing out. When you capture media with a single clip in the list, the clip is captured based on the mark-in and mark-out timecodes. In each case, the media is saved in a TIFO file. When more than one clip is in the list, you can not use this method to capture media. However, you can create an EDL with multiple clips in the list.

When you capture media, Pipeline encodes the SDI input and streams digital media to your computer via the LAN, which is encoded based on your current format selection in Pipeline Direct. The digital stream is written to a TIFO file ([Telestream Intermediary Format \(TIFO\) on page 66](#)) in real time.

TIFO files created by Pipeline can be used as source media in FlipFactory 6.0 (or later) and/or Episode 5.0 (or later) workflows for transcoding and delivery. TIFO files can be processed in real time by FlipFactory and Episode Engine. Episode Desktop can process TIFO files as well, after the file has been closed.

Connect and Select a Format

To capture streaming media connected to the SDI Input port on your Pipeline, follow these steps (this example utilizes Internet Explorer 6 and 7 – the experience in other browsers is similar):

1. Open your browser, log on to the Pipeline and display the Live panel.
2. Use VTR controls or queue your video source for preview (unless you're capturing a single clip or crash recording). Make sure that the list is empty (or there's a single entry if you want to capture it).
3. Now, hover over the Capture button in the EDL panel to display a format list.

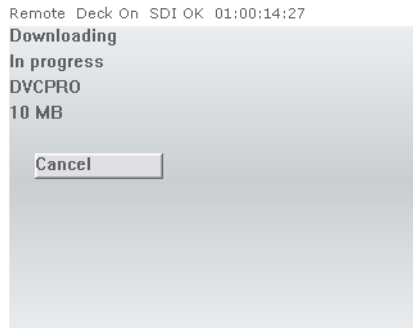


4. Click the format you want to capture media in.



Save the File with the Pipeline File Download Manager

5. (Internet Explorer) Right-click in video preview and make sure Use Download Manager is checked.
6. (Internet Explorer) Click Capture in the EDL List panel to display the Pipeline Download Manager status information in the video preview region:



7. Click Start in the EDL List panel when you want to begin capturing media (Start changes to Stop).
Pipeline streams the media; Pipeline Direct saves it in the TIFO file. When using Internet Explorer, the file is saved in the directory selected in Pipeline Download Manager Preferences (below), with a default name. Firefox defaults to the desktop and Safari defaults to the Downloads folder in the user's folder.
(Internet Explorer) You can view transfer progress in the video preview region. During crash recording, you can also display the Pipeline Download Manager Preferences to view details.
8. When you want to stop capturing, click Stop (renamed from Start). Pipeline closes the TIFO file.

Pipeline Download Manager Preferences

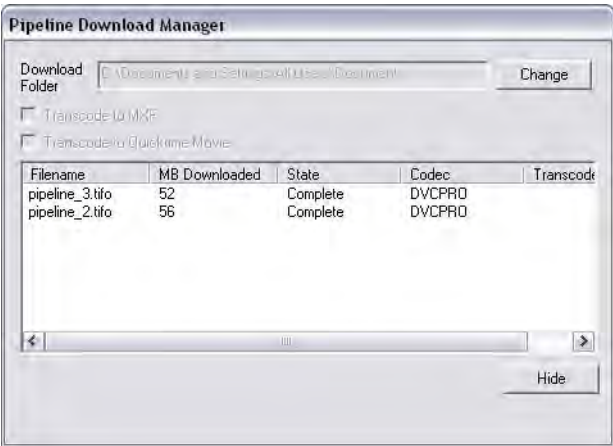


Note

When using Internet Explorer, Telestream recommends using the Pipeline Download Manager. If you disable the Pipeline Download Manager, you'll have to use the download manager provided by your browser, and should know how it functions. With Internet Explorer, if the Download Manager is not used the file size is limited to 2GB.

9. (Internet Explorer) To display Pipeline Download Manager Preferences, right-click in the video preview region and select Show Download Manager options.





Download Folder. Click Change to browse and select a download folder where all TIFO files will be saved during crash recording.

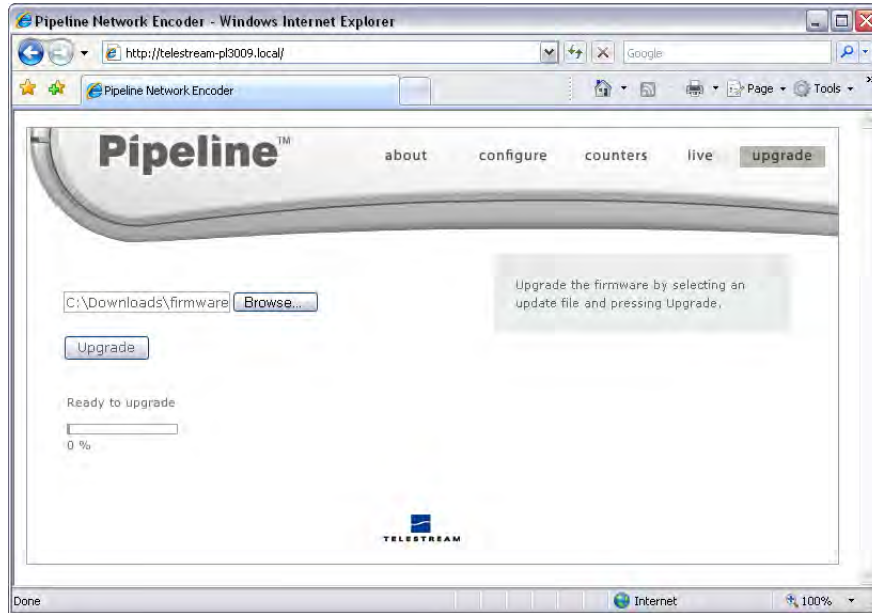
File Table. Displays a list of TIFO files that have been saved in this session, with details.



Using the Upgrade Panel

To display the Upgrade panel, click **upgrade** in the menubar at the top of the window:

Figure 5–13. Upgrade panel allows you to upgrade Pipeline firmware



Pipeline is designed so its firmware and Pipeline Direct Web application can be upgraded easily when new revisions of Pipeline software are made available by Telestream.



Note

To determine the current version of your Pipeline, log on and display the Configure page. The version number is the value in the App field, which displays the firmware version number: <Major Version>, <Minor Version> <Build Number> <Internal Use>. For example: 2,2,33165,00 indicates Version 2.2, Build 33165.

Pipeline Direct periodically communicates with the Telestream Web site to determine if upgrades are available, then notifies you. If your Pipeline is blocked from the Internet or direct-connected to your computer, you can periodically check the Pipeline support page at www.telestream.net/telestream-support/pipeline/updates.htm to determine if there is newer software. (Registered users are notified of upgrades via E-mail.) On the site, click Support > Support Home in the main menu at the top of the page, then select Pipeline > Updates on the right, under Enterprise Product Support. Pipeline firmware updates are displayed in the main column at the bottom of the page.

To upgrade a Pipeline, follow these steps:

1. Connect to the target Pipeline and determine the current firmware version via the Configure panel (Using the Configure Panel on page 44).
2. Log on to the Pipeline support page at www.telestream.net/telestream-support/pipeline/updates.htm.
3. Download the Pipeline firmware file (*firmware-xxxxx.pln*) to your computer.

After downloading the firmware file, upgrade the firmware by following these steps:



1. Log on to the target Pipeline using Pipeline Direct.
2. Select Upgrade from the menu to display the Upgrade panel.
3. Click Choose File to locate and select the firmware file (*firmware.xxxxx.pln*) you plan to use.
4. Click Upgrade and observe the progress bar and notes about the process.

During a firmware upgrade, the front SDI In LED (on left) lights yellow during the upgrade process. When the Pipeline has been upgraded, Pipeline Direct reboots the Pipeline and displays a rebooting message on the Upgrade page. In about 15 to 30 seconds, both the In and Power LEDs light green. Pipeline Direct reconnects automatically and displays the Configure panel.



Note

The first time you display the live panel after upgrading, you may have to install the Pipeline Library.

5. When you display the live panel, Pipeline Direct may display an installation message in the preview panel: "Click here to install the following ActiveX control: Pipeline Library, from Telestream, Inc." Click to install the ActiveX control, and click Install on the installer window.





CHAPTER 6

Using Pipeline Control

Use this chapter to learn about Pipeline Control and how to use Pipeline Control's general features.

Pipeline Control is a client application for controlling digital media capture and play out from Pipeline devices. Pipeline Control is available for both Mac OS X and Windows users. Pipeline control provides different document types to provide log and capture, scheduled capture and play out, triggered manual and automated capture, and various types of print-to-tape operations.

Pipeline Control supports both SD and HD – Pipeline SC, Pipeline Quad, and Pipeline HD Dual.

Topics

- [Pipeline Control Overview \(page 62\)](#)
- [Starting Pipeline Control \(page 63\)](#)
- [Creating New Pipeline Control Documents \(page 64\)](#)
- [Pipeline Control Menus \(page 66\)](#)
- [Using The Pipeline Settings Panel \(page 69\)](#)
- [Configuring Publishers \(page 76\)](#)
- [Using the Pipeline State Panel \(page 79\)](#)
- [Using The Video Preview Panel \(page 80\)](#)
- [Using the Audio Preview Panel \(page 81\)](#)
- [Loading and Saving Clip List Files \(page 81\)](#)
- [Setting Up Pipeline Control Options \(page 83\)](#)
- [Using the Diagnostics Panel \(page 87\)](#)
- [Telestream Intermediary Format \(TIFO\) \(page 89\)](#)
- [Storage Models and File Formats/Wrappers \(page 88\)](#)



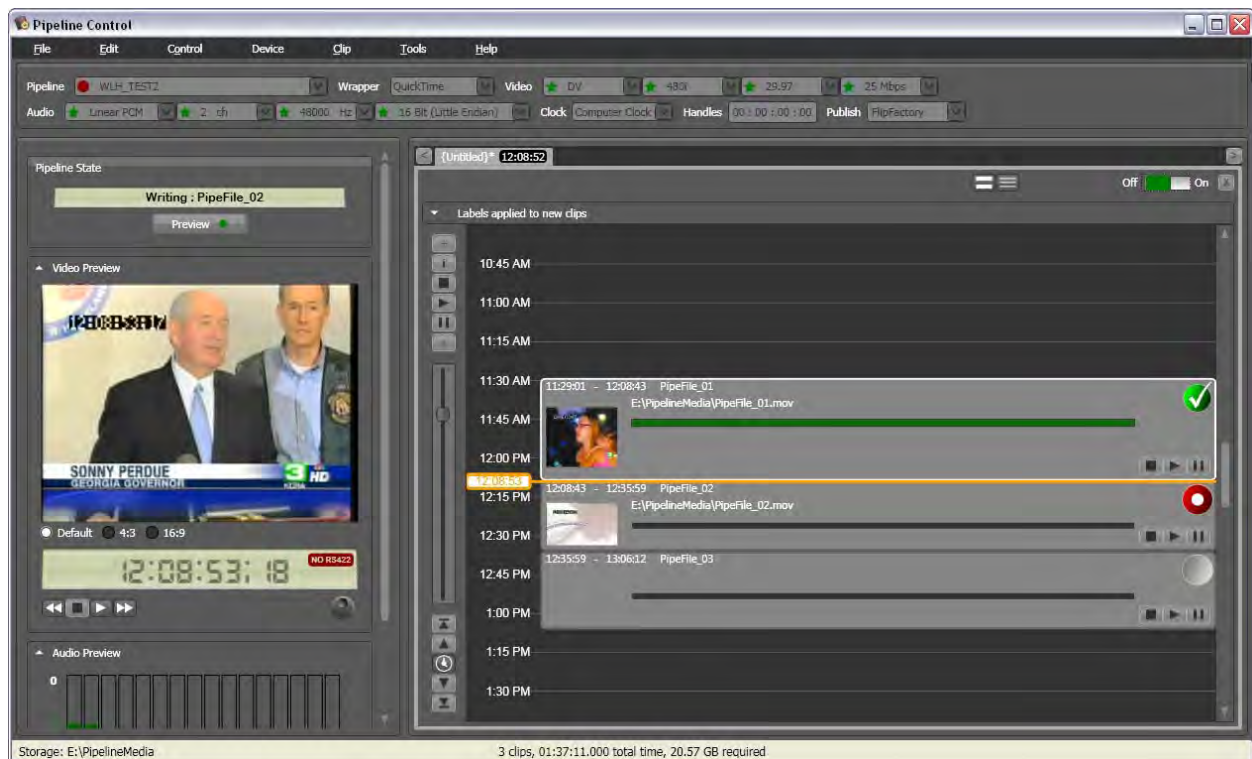
PIPELINE CONTROL OVERVIEW

Pipeline Control enables you to select a specific Pipeline and configure it for your workflow requirements.

Pipeline Control provides specific document types to support various digital media recording and playout tasks: Scheduled Capture (usually called a *Schedule*, for short), Log & Capture, Trigger (for manual or automated capture), Record and Automate, and Playout & Print-to-Tape.

Pipeline Control allows you to open multiple documents at the same time and work with them in tabbed windows.

Figure 6–1. Typical Pipeline Control window for Windows (Schedule window shown)



Pipelines are discovered and tracked on your network by two methods: Bonjour or manually. Bonjour is preferred on most networks, because its automatic. You can use the manual discovery feature ([Discovery Tab on page 85](#)) to discover and track Pipelines across subnets or when Bonjour traffic is blocked.

Pipeline Control executes the tasks you specify in each document independently of tasks in other open documents. Tasks are executed when you activate (or turn on) a document. The panels on the left are generally the same in all document types. The panels and controls on the right are unique to each document type. Tasks specified in a document are executed when the document is activated.

Before you start working in a window, make sure the window is actually the one you want to update.



Note

Drag and Drop is supported in some windows. On Windows Server platforms, Windows Explorer does not run as administrator. However, Pipeline Control by default runs as administrator. When running Pipeline is running as administrator, files cannot be dragged from a Windows Explorer window into Pipeline Control window.



STARTING PIPELINE CONTROL

You can start Pipeline Control by selecting start > Programs > Telestream > Pipeline > Pipeline Control.

You can also start Pipeline Control by double-clicking a Pipeline document you've saved. Or, by dropping a Pipeline document onto the Pipeline Control icon in the Programs folder or a Pipeline Control shortcut on your desktop, for example.



Note

Pipeline Control can only be used with Pipelines whose firmware is compatible.

When you install or upgrade Pipeline software, you may need to upgrade your Pipeline firmware as well. If you select a Pipeline with older firmware that is incompatible with the current version of Pipeline Control, you will be warned that this may cause problems.

When you open schedules created in previous versions of Pipeline Control, you may need to reset the audio and video settings before using them.

By default, Pipeline documents are saved in the My Documents folder. When you open Pipeline Control in this manner, the Pipeline document you double-clicked is displayed.



Note

If you're opening Pipeline Control for the first time, you should set up your Pipeline Control preferences. For details on setting up Pipeline Control preferences, see [Setting Up Pipeline Control Options \(page 83\)](#).



CREATING NEW PIPELINE CONTROL DOCUMENTS

Pipeline Control provides specific document types to support various tasks you can perform.

Creating New Documents via the Task Selector

When you start Pipeline Control (or when no documents are open), it displays a Task Selector panel that allows you to choose which task you want to perform (and thus, which type of document to display):

Figure 6–2. Use the Task Selector to create new documents.



Scheduled Capture (Page 97). Click the Scheduled Capture button to create and display a new, untitled Scheduled Capture document.

Log & Capture. (Page 107) . Click the Log & Capture button to create and display a new, untitled Log & Capture document.

Triggered Capture (Page 117). Click Triggered Capture to create and display a new, untitled Triggered Capture document.

Print-to-tape (Page 125). Click Print-to-Tape to create and display a new, untitled Print-to-Tape document.



Note

For details on how to use the panels, controls, and features of each type of document, go to their respective chapters.



Creating New Documents via the File Menu

You can also create a new, untitled document by selecting the menu item of the appropriate window type in the File menu.

For details about how to use these documents to perform various recording tasks, see these chapters:

- Scheduled Capture – [Page 97](#)
- Log & Capture – [Page 107](#)
- Triggered Capture – [Page 117](#)
- Print-to-Tape – [Page 125](#)



PIPELINE CONTROL MENUS

Use this section as a quick reference for menu items. (General menus and menu items are not described.)

File Menu

Open. Displays an Open File dialog so you can browse and open saved Pipeline Control documents.

New Schedule. Displays a new, untitled Schedule Capture document.

New Log & Capture. Displays a new, untitled Log & Capture document.

New Trigger. Displays a new, untitled Triggered Capture document.

New Print to Tape. Displays a new, untitled Print to Tape document.

Import GVG 4 EDL. Displays an Open dialog so you can import a GVG 4 EDL file. ([Loading and Saving Clip List Files \(page 81\)](#)). EDLs are generated by Final Cut Pro, Avid software, & Pipeline Direct.

Import Final Cut Pro XML. Displays an Open dialog, so you can import a Final Cut Pro XML Interchange file. ([Loading and Saving Clip List Files \(page 81\)](#)).

Export GVG 4 EDL. Displays an File dialog so you can save the current clip list as a GVG 4 EDL file. ([Loading and Saving Clip List Files \(page 81\)](#)).

Export Final Cut Pro XML. Displays a File dialog so you can save the current clip list as a Final Cut Pro XML Interchange file. ([Loading and Saving Clip List Files \(page 81\)](#)).

Exit. Closes the program. If any document has not been saved or has unsaved changes, Pipeline Control asks you if you want to save the document before closing.

Save. Saves the changes to the active window in a new document.

Save As. Displays a Save File dialog so you can save the document with a different name or in a different directory.

Save Settings as Template. Saves your current settings as default: Pipeline, wrapper, video (codec, frame size, frame rate, quality), audio (type, channels, bit depth), clock, handles, and publish. After saving your settings as a template, new documents that you create inherit these settings.



Note

*Templates are stored in a file named `template.pipeline` in Documents and Settings:
`C:\Documents and Settings\<user>\Application Data\Telestream\template.pipeline`.*

To return Pipeline Control to default document settings, delete this file.

Control Menu

The menu items under the control menu control the state of the selected (frontmost) window.

Preview. Click to connect to the selected Pipeline and display the source media, if any. You can preview video and audio whether the document is activated or deactivated. Select again to stop preview.



Active. Click to activate the document. When a document is active, it can't be edited, and it is being processed. To deactivate the document (to stop processing or to modify it), select it again.

Device Menu and Keyboard Shortcuts

The Device menu provides commands for controlling the VTR of the connected device using the following keyboard commands and keyboard shortcuts.

Play – Space bar. Put VTR in play mode and play the video forward at normal forward speed.

Stop – K. Stop the VTR at the current play point.

Rewind – J. Play video backward at the deck's rewind speed.

Fast Forward – L. Play forward at deck's fast forward speed.

Step Backward – [(Left Brace). Step one frame backward.

Step Forward –] (Right Brace). Step one frame forward.

Go To Start (local playback only) – Control-[(Left Brace). Return the clip to the beginning.

Go To End (local playback only) – Control-] (Right Brace). Go to the end of the tape.

Clip Menu

The Clip menu commands enable you to edit or delete clips, and provide keyboard shortcuts when you are creating a new clip.

Add. Creates a new event.

Clear. Remove the selected clip (the file is not deleted from the file system.)

Edit. Edit the selected clip details and metadata.

Review. Select to review a captured clip in the Preview panel.

The following menu items are only available in Log and Capture documents:

Quick Mark – M. Single-click feature for logging a clip and setting a new mark in point. Click to set the current point on the tape as the mark out point and logs the clip. The last clip's mark out point becomes the new mark in point, so that you only have to click Quick Mark again to set the out point and log the clip.

Set Mark In – I. Set the tape's current timecode as the clip's in point.

Set Mark Out – O. Set the tapes current timecode as the clip's out point.

Go To Mark In. Roll the tape to the point specified in the Mark In timecode field.

Go To Mark Out. Roll the tape to the point specified in the Mark Out timecode field.

Log Clip – P. Create a clip under the current tape name in the tape field, using the values in the General and metadata tabs.



Tools Menu

Options. Displays the Options window, so you can configure your capture, device, update, discovery, and security settings ([Setting Up Pipeline Control Options \(page 83\)](#)).

Help Menu

User's Guide. Displays the Pipeline User's Guide (the guide you are reading).

About Pipeline Control. Displays the About dialog with Pipeline Control's version number.



USING THE PIPELINE SETTINGS PANEL

At the top of Pipeline Control is the Pipeline Settings panel. This panel displays the Pipeline settings for the active window. There are several selectors in the panel. These selectors enable you to select a specific Pipeline, and configure the document to use it specifically for the tasks or workflow you intend. Some selectors do not display in certain document types. For example, in a Trigger document, the Handles selector doesn't display.



Note
In preview mode, these settings are disabled and you can't make changes. To make changes, you must first return to idle mode. If Pipeline Control is has been locked ([Security Tab on page 86](#)), you also can't make changes to Pipeline settings. Use the password to unlock Pipeline Control if you need to make changes to Pipeline settings.

Figure 6–3. Windows Pipeline Settings panel.

Pipeline Selector. Click to select a Pipeline.

Wrapper. Click to select a file type.

Video. Click to select and configure the video codec.

Audio. Click to select and configure the audio codec.

Publish. Click to select an action to perform when each clip is ready.

Clock. Click to select a timecode clock source.

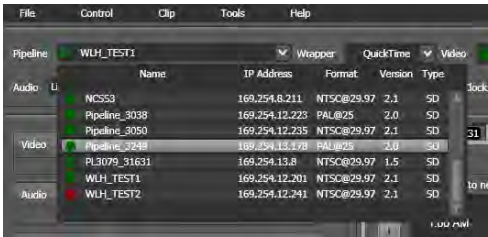
Handles. Adjust the time value of handles.

These settings are saved with the document. When the document is connected to a Pipeline, the Pipeline is configured for the task, based on these settings.

Selecting a Pipeline

To select a Pipeline, click the Pipeline dropdown list and pick one from the list.

Figure 6–4. Windows Pipeline browser and selection window.



A green bullet icon indicates that this Pipeline is available. A red bullet indicates that it is currently busy (connected to another client application). Gray indicates offline; yellow indicates an unknown state. To enable you to select a Pipeline to set up a document for use later, you can select a Pipeline regardless of its state.



Selecting a Wrapper

Click the Wrapper dropdown menu to select the wrapper/file format for this clip when captured. For details about supported file formats and wrappers, see [Storage Models and File Formats/Wrappers \(page 88\)](#).

QuickTime

QuickTime (Open) files can be edited in Final Cut Pro as they are being captured. Because of this characteristic, the length specified in the QuickTime file header is set at the beginning of the capture event. If the captured event stops before the predetermined time, the QuickTime file retains the initial length.



Note

Although the file retains the initial length, the file's size is determined by the actual captured media.

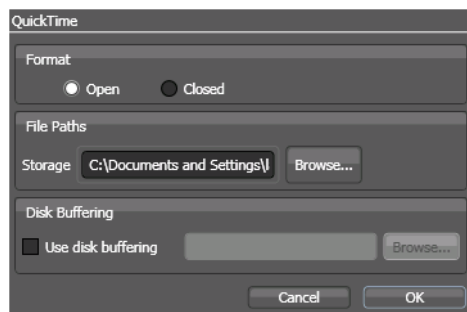
Although Open QuickTime files can be played while capturing, the behavior of QuickTime is different between Mac OS X and Windows. In QuickTime for Mac OS X, the clip can be played to the current point of capture. In QuickTime for Windows, the clip can only be viewed to the point that had been captured when the clip was opened in QuickTime. This is a limitation of QuickTime for Windows.

For example, when a Pipeline is capturing media to a network share, on Mac OS X you can open the clip in QuickTime and play it to the current point of capture. However, if the same clip is opened in QuickTime for Windows it can only be viewed to the point that had been captured *at the moment the clip was opened*.

Closed QuickTime files can't be opened while they are being captured. Use closed QuickTime files if you will not be editing or reviewing (playing out in QuickTime player) while capturing. Use closed QuickTime files when crash recording an event, and a specific duration is not known in advance.

When you select QuickTime format, Pipeline Control displays this configuration dialog:

Table 6–1. QuickTime Wrapper Configuration



Open|Closed. Select Open QuickTime or Closed QuickTime by selecting the radio button.

Storage. Click Browse to navigate to and select a storage directory for your files.

Use Disk Buffering. Check to use disk buffering during capture ([Disk Buffering Details \(page 34\)](#)).

Buffer Storage. Click Browse to navigate to and select a buffer directory.

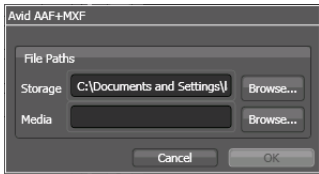
Avid AAF+MXF

Avid AAF+MXF files created by Pipeline Control can be imported into Avid editors.

When you select Avid AAF+MXF format, Pipeline Control displays this configuration dialog:



Table 6–2. Avid AAF+MXF File Configuration



Storage. Click Browse to navigate to and select a storage directory for the Avid AAF files associated with each clip. Import the AAF master clip file into your Avid edit application.

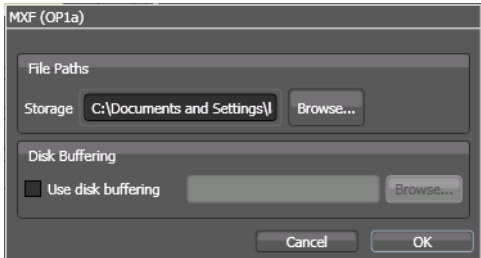
Media. Click Browse to navigate to and select a media directory for the MXF audio and video files associated with this clip. In most cases this should be the *Mediafiles/1* folder used by the Avid edit system.

Generic MXF (OP1a)

Generic MXF (OP1a) files are an MXF Operational Pattern 1a (OP1a, SMPTE 379M-2004) file with a generic container mapped to DV25, DVCPro HD, IMX or DNxHD (VC-3) video essence.

When you select Generic MXF (OP1a) format, Pipeline Control displays this configuration dialog:

Table 6–3. Generic MXF (OP1a) File Configuration



Storage. Click Browse to navigate to and select a storage directory for your files.

Use Disk Buffering. Check to use disk buffering during capture ([Disk Buffering Details \(page 34\)](#)).

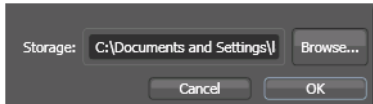
Buffer Storage. Click Browse to navigate to and select a buffer directory.

XDCAM MXF

XDCAM files are an MXF Operational Pattern 1a (OP1a) file compatible with Sony XDCAM MXF and are limited to DV25 and IMX video essences. Disk buffering is not supported for XDCAM files. Use XDCAM MXF when capturing OP1a clips to be imported into an Avid system.

When you select XDCAM format, Pipeline Control displays this configuration dialog:

Table 6–4. XDCAM File Configuration



Storage. Click Browse to navigate to and select a storage directory for your files.

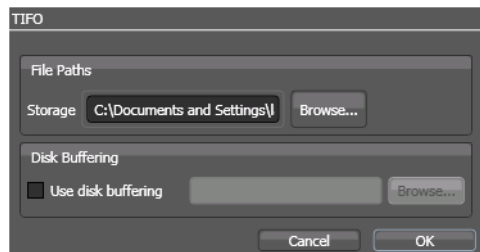


TIFO

TIFO files can be transcoded with FlipFactory or Episode Engine as they are being captured. This wrapper type can be used with Pipeline Control's FlipFactory or Episode Engine publish plug-in (Mac OS X only) to allow for real time transcode while capturing. (For details, see [FlipFactory Publisher \(page 76\)](#) and [Episode Engine Publisher](#) in the Pipeline User's Guide for Mac OS X).

The same workflow can be achieved on Windows by using Episode Engine's Pipeline File monitor, which is an input monitor that transcodes TIFO files as they're written.

Table 6–5. TIFO File Configuration



Storage. Click Browse to navigate to and select a storage directory for your files.

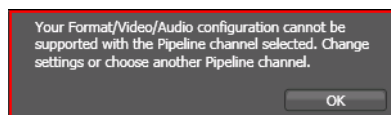
Use Disk Buffering. Check to use disk buffering during capture ([Disk Buffering Details \(page 34\)](#)).

Buffer Storage. Click Browse to navigate to and select a buffer directory.

Selecting and Configuring Codecs

When you don't have a Pipeline selected (None), all codecs display. When you select a specific Pipeline, only those codecs supported by the target Pipeline are hinted with a green star icon. When choosing the frame rate, make sure you're providing an appropriate (NTSC or PAL) source.

Figure 6–5. Pipeline Control notifies you when a codec is not supported by the Pipeline.



Based on your Pipeline, you can select from Motion JPEG, DV, DVCPro, DVCPro HD, IMX, MPEG2 I-Frame, ProRes, Avid DNxHD, Apple ProRes, and Uncompressed codecs. Each codec has one or more profiles from which you can choose.



Note

Settings are hinted when they are known to work with the selected Pipeline or wrapper and its current input signal. However, you may be creating documents for later use, when the signal is different, so you can select settings that may work if you change the Pipeline's input signal.

Hints also indicate the settings that are known to work given the selected wrapper format, such as QuickTime, TIFO, or MXF-OP1a. If both the selected wrapper and the selected Pipeline support the setting, it is hinted.

If you've already selected a codec and settings – and you select a Pipeline that doesn't support it – Pipeline Control will notify you when you connect that it doesn't support the selected codec.

Each codec's profile details are located in Appendix C, [Pipeline Control Codec Profiles \(page 167\)](#).

When you select a codec only the resolutions that apply to that codec are selectable. Frame Rate and Quality settings are filtered based on the resolution you select. Based on the SDI signal of the connected Pipeline, resolutions and frame rates that display a green star are compatible with the current signal.



Note

If the source is HD and you choose an SD codec, Pipeline down-converts the video according to your settings. However, the video quality may not meet your production workflow requirements.

The SD SDI stream being ingested by the Pipeline may be an NTSC or a PAL source: if you select an NTSC frame rate to encode PAL, or a PAL frame rate to encode NTSC, Pipeline Control displays an error and prevents the capture from occurring.

When selecting a Quality setting for NTSC or PAL captures be sure to select a setting with an Anamorphic suffix if the SDI source of the Pipeline requires anamorphic encoding. When selected, video preview is displayed at the correct aspect ratio and Pipeline Control embeds a display size flag in the QuickTime file so that other QuickTime applications can determine the correct display aspect ratio.

Selecting and Configuring a Video Codec

Click the Video drop down menu to select the video codec you want to use. Based on your selection, the frame size, frame rate, and quality dropdown menus populate with available values. Select the frame size, rate, and quality from the dropdown menus to meet your workflow requirements.

Configuring the Audio PCM Audio Codec

In this version of Pipeline Control, only Linear PCM is available. Select the number of channels, bit rate, and sample size from the dropdown menus. Valid options display with a green star icon (hinted).

When you don't have a specific Pipeline selected (None), all Quality settings can be selected. Audio parameters include Channels (2, 4, 8, or 16), Sample Rate (always 48K) and Quality (16-bit or 24-bit, Big Endian and Little Endian).



Selecting a Timecode Clock Source

Click the Clock dropdown menu to select which device provides the timecode clock source signal. You must be connected to a Pipeline in order to obtain a timecode clock source, except when you choose Computer Clock. Choose from Auto, RS-422 Device, Sync Input (Pipeline Quad and Pipeline HD Dual), Video Input, Internal Clock, Computer Clock, Pipeline Channel 1, or Zero Based timecode when connected to a Pipeline Quad. When you change your timecode clock source, save your file to save changes.



Note

The clock settings in the Pipeline Control application are used instead of the clock settings in the Pipeline. The Pipeline's clock settings can be viewed and changed using Pipeline Direct ([Using the Configure Panel on page 44](#)). When you configure clock settings in a schedule they are stored with the schedule, and do not change the settings in the selected Pipeline.

Auto. When you select Auto and the selected Pipeline is set to a specific timecode option, the Pipeline provides a timecode clock source based on the setting. For example, if the Input SDI signal for Timecode option is checked and the Input SDI signal contains a VITC timecode, the Input SDI signal VITC timecode is always used. (However, if there is no timecode in the SDI signal, a zero timecode is supplied (see [Table 6–6](#) for Pipeline SC, [Table 6–7](#) for Pipeline Quad (following), in the Primary Reference column below for timecode clock source priority).

When you select Auto in the schedule and also select Auto in the Pipeline itself ([Using the Configure Panel on page 44](#)) using Pipeline Direct, utilize the two tables below. Timecode clock source availability is noted, by priority (top to bottom) of the reference.

Table 6–6. Pipeline SC – auto mode timecode clock source options

Available Time Code sources			Primary reference
SDI Input time code available	RS422 time code available	SNTP time code available	Time code Reference used by Pipeline
-	✓ Available	-	RS422
✓ Available	Not available	-	Input SDI VBI
Not available	Not available	✓ Available	SNTP Server
Not available	Not available	Not available	Zero based upon connection

Table 6–7. Pipeline Quad and HD Dual – auto mode timecode Clock source options

Auto time code - Pipeline multi-channel device

Device option	Available Time Code sources				Primary reference
"Input SDI signal for Timecode" option	SDI Input time code available	RS422 time code available	Ext Sync Ref time code available*	SNTP time code available	Time code Reference used by Pipeline
Checked	✓ Available	-	-	-	Input SDI VBI
Checked	Not available	-	-	✓ Available	SNTP Server
Not Checked	-	✓ Available	-	-	RS422
Not Checked	-	Not available	✓ Available	-	Ext Sync SDI VBI
Not Checked	✓ Available	Not available	Not available	-	Input SDI VBI
Not Checked	Not available	Not available	Not available	✓ Available	SNTP Server
Not Checked	Not available	Not available	Not available	Not available	Zero based upon connection



For example, if you're connected to a Pipeline SC and RS-422 has a timecode, it will be used because it is highest priority (column on right). If not, SDI timecode will be used (2nd priority), etc.

RS-422 Device. Uses the timecode provided by the device attached to the RS-422 port on the target Pipeline; usually a VTR. If the timecode is not available, the Pipeline timecode is provided; a zero-based timecode is provided if the Pipeline is not configured to use an SNTP server.

Reference Input. For use with Pipeline Quad and HD Dual only. Uses the timecode provided through the Reference Input signal in VBI or VANC. If the timecode is not available, a zero-based timecode is provided. *Do not select Reference Input if you are connected to a single-channel Pipeline.*

Video Input. Uses the timecode provided on the Pipeline's video input signal in VBI or VANC. If the timecode is not available a zero-based timecode is provided, unless the Pipeline is configured to use an SNTP server.

Pipeline Clock. Uses the timecode provided by the Pipeline itself. A zero-based timecode is provided if the Pipeline is not configured to use an SNTP server.

Computer Clock. Uses the timecode provided by the host computer on which Pipeline Control is running.

Pipeline Channel 1. When connected to a Pipeline Quad you can select Channel 1's timecode. This enables multiple channels of a Quad to share a common timecode when an external timecode, either on the video input or the Reference input, is not available.

Zero Based . Capture operations begin at 00:00:00:00, instead of any other clock source.

Setting up Handles

The Handles control displays only in Log & Capture and Schedule documents. Enter the value in minutes and seconds, up to 5:59 minutes to capture before and after the actual scheduled capture time.

Selecting a Publisher

Click the Publish dropdown menu to select the system that you want to notify for each clip event. FlipFactory and Copy publishers automatically send jobs when the file is ready. For details about setting up each type of publisher, see [Configuring Publishers \(page 76\)](#).

If you don't want to directly connect to another system in your workflow to pass the saved media file and optional metadata, select None.



CONFIGURING PUBLISHERS

Publishers are methods of notifying a specific system that an event has occurred, or that media is available for processing. Methods differ, based on the notification requirements of the system you've selected. When you select a publisher, you're prompted to configure it. You can select and use one publisher per schedule.

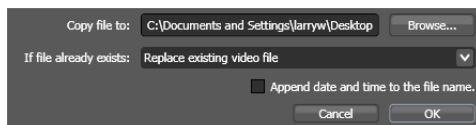
- [FlipFactory Publisher \(page 76\)](#)
- [Copy File Publisher \(page 76\)](#)

Copy File Publisher

The Copy File publisher is used to copy a captured clip to another local folder or network share.

To select Copy File as a publisher, select Publish > Copy File. The following edit panel displays.

Figure 6–6. Copy File publisher allows you to duplicate just-completed clips.



Complete the panel and click OK. Save the schedule to save these settings. Make sure you test your configuration before putting the schedule into production.

Copy File To. Click to display the File System dialog, and select the folder where you want to copy the file.

If File Already Exists. Select the action to take if there is already a file of the same name in this folder: Replace the existing file, save the new file with a unique name, or don't copy the new file.

Append date and time to file name. The date and time is appended, in the format YYYY-MM-DD HH-MM-SS. For example, if the file *Pipeline10.MOV* was created on December 5, 2008 at 13:15 when copied, it would be named *Pipeline10 2008-12-05 13-15-00.MOV*.

FlipFactory Publisher

Set up and use the FlipFactory publisher in Pipeline Control when you want to implement Pipeline Control > FlipFactory workflows that automatically submit media to a factory for processing. Optionally, you can implement submit metadata on a per-job basis.



Note

Telestream recommends installing Pipeline Control on a computer that is not hosting FlipFactory or other media processing applications: intense disk and CPU consumption can interfere with proper operation of both applications.

FlipFactory publisher requires FlipFactory version 6.0 (with update packs 1-4 installed), or greater. (See FlipFactory support Web page at www.telestream.net for updates.)

When submitting jobs with TIFO files, it is important to save the file directly on the FlipFactory or Episode Engine server for efficient processing by FlipFactory.

Refer to [Typical Pipeline Systems and Considerations \(page 29\)](#) when writing media files to a shared storage location (SAN, NAS or shared network folder).



Factories used by FlipFactory publishers should not have a monitor enabled. The FlipFactory publisher submits job messages directly to the Flip Engine server, eliminating the requirement for a monitor. Alternatively, you can configure a factory with a monitor that monitors the storage location specified in your wrapper format, and *do not* implement a FlipFactory publisher in your Pipeline Control document.

The FlipFactory publisher can integrate with the factory you've specified in Pipeline Control using any file format and wrapper (except for Avid AAF+MXF) you need for your workflow requirements. To speed your workflow to near real-time by starting transcoding as soon as capture starts, select TIFO as the file type.

Using TIFO files, FlipFactory is notified as soon as the file is created and transcoding occurs as soon as it is available, thus shortening total processing time. When capturing media in QuickTime files or other wrappers, FlipFactory is notified when the operation is complete and the file is closed.

Design your Pipeline Control > FlipFactory Workflow

Set up your FlipFactory Factory. Configure a factory to produce the media and optionally process metadata per your workflow requirements. Do not enable a monitor – the FlipFactory publisher submits jobs automatically.

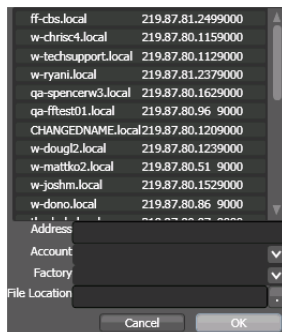
Set up your Pipeline Control Document. Create and configure a Pipeline Control document for this workflow, including the wrapper and media format, and the storage location for captured clip files. In the Wrapper dialog, specify the storage location: local on your Pipeline Control host system, on a network share, or a share directly on the FlipFactory server (recommended specifically for TIFO files, processed in real time).

Enable and configure the FlipFactory publisher to automatically submit media files you've captured in your document to a specific location, and a specific FlipFactory factory for processing.

The FlipFactory publisher implements automatic file integration by instructing your factory to ingest media from the server (local, network share, or FlipFactory) where you have configured the Pipeline Control document to write clip files, using the Wrapper dialog.

To select FlipFactory as a publisher, select Publish > FlipFactory. The following panel displays:

Figure 6–7. FlipFactory publisher panel allows you to submit media to a specific factory.



FlipFactory Server. Select the target FlipFactory from the list.

Address. Displays the selected FlipFactory server; allows you to enter it manually – enter its IP address or server name and port number in the form <IP address|ServerName>.local:<Port Number (default 9000)>.

If you're submitting jobs to a FactoryArray, enter the FactoryArray's virtual IP Address in the Address field. After selecting or entering the FlipFactory server's ID, the FlipFactory Publisher will connect to the FlipFactory database to obtain the accounts and associated factories and display them.



Account. Select the account on the selected FlipFactory from the popup menu. When you select an account, Pipeline Control queries FlipFactory for a list of factories in the account, and takes a few seconds.

Select the factory from the list of factories in the selected account. If this factory has metadata labels, they will be displayed so that you can provide metadata values to submit to the factory.

File Location. When selecting a directory from the File location list, note that the path is formed from the perspective of the FlipFactory server.



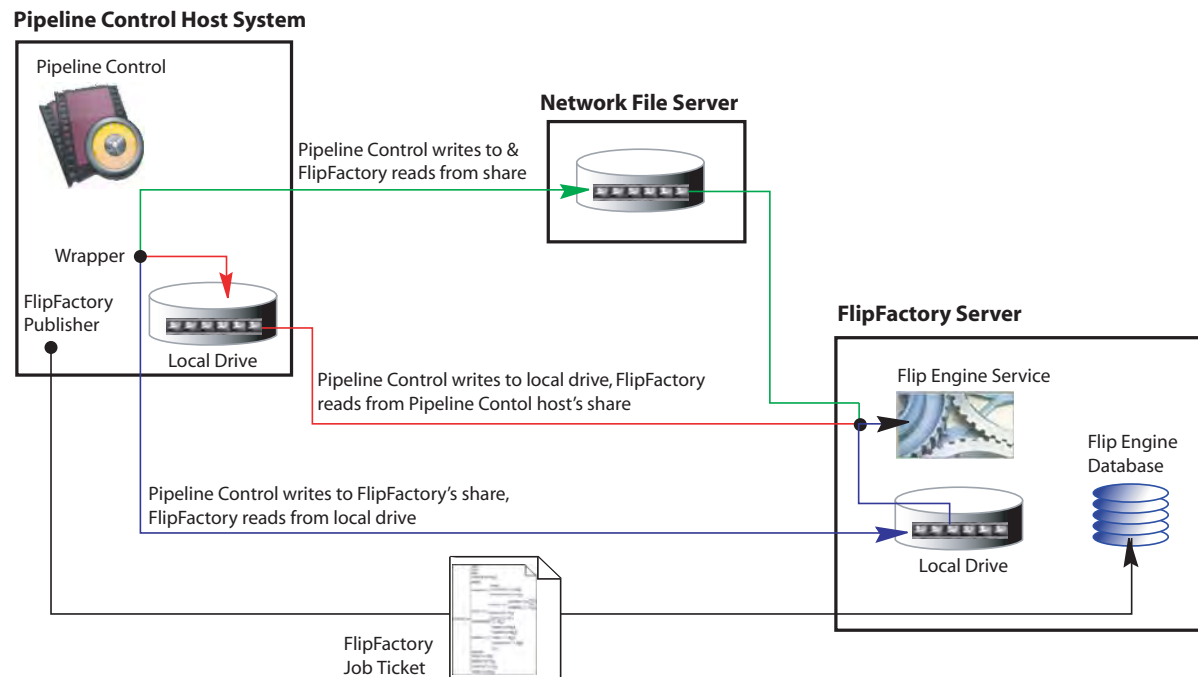
Note

The servers, drives, and folders are local to the FlipFactory server. Only select a local drive/folder when Pipeline Control is configured in the Wrapper to write clip files directly to a FlipFactory server share.

All metadata labels associated with the selected account are displayed in Pipeline Control for data entry.

If the Pipeline Control wrapper Location has been configured to write files to a shared network folder (either directly on the Pipeline Control host system or other network file server), manually enter a path to the file in UNC format. If the Pipeline Control wrapper Location has been configured to write files to a shared network folder directly on the FlipFactory server, click Browse to navigate and select the local directory in drive-letter format.

Figure 6–8. Pipeline Control – FlipFactory file sharing options.



Use this table to determine how to specify the Pipeline Control file read and write directory in Pipeline Controls' Wrapper dialog and FlipFactory publisher dialog:



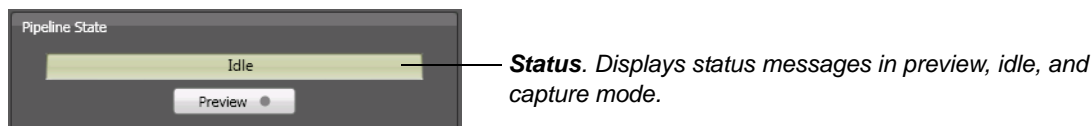
Table 6–8. Configuring clip file paths for Pipeline Control and FlipFactory access.

Pipeline Control File Write Directory	FlipFactory File Read Directory
<p>Pipeline Control Local Directory. In the Wrapper dialog, browse and select a letter-drive directory on this computer. The directory must be configured as a share for FlipFactory and the user name Flip Engine service operates under must have Read permission. Syntax: <Drive>\<directory>\... Example: C:\PipelineControl\ScheduleClips</p>	<p>Pipeline Control Local Directory. In the FlipFactory Publisher dialog, browse and select the share on the Pipeline Control host system. Syntax: \\<PipelineControl Host>\<ShareName> Example: \\PipelineControl\ScheduleClips</p>
<p>Network Share. In the Wrapper dialog, browse and select the share on the network file server. The user names Pipeline Control operates under must have Full Control permission and Flip Engine service operates under must have Read permission. Syntax: \\<Network File Server>\<ShareName> Example: \\NetServer007\ScheduleClips</p>	<p>Network Share. In the FlipFactory Publisher dialog, browse and select the same Share on the target network file server. Syntax: \\<Network File Server>\<ShareName> Example: \\NetServer007\ScheduleClips</p>
<p>FlipFactory Server Local Directory. In the Wrapper dialog, browse and select a Share on the FlipFactory server. Syntax: \\<FlipFactory Server>\<ShareName> Example: \\FlipFactory001\ScheduleClips</p>	<p>FlipFactory Server Local Directory. In the FlipFactory Publisher dialog, browse to select the directory directly on the FlipFactory server. The directory must be set up as a share for Pipeline Control and the user name Pipeline Control operates under must have Full Control permissions. Syntax: <Drive>\<directory>\... Example: C:\FFStores\ScheduleClips</p>

Configure the settings in the panel and click OK. Make sure you test before putting the document into production.

USING THE PIPELINE STATE PANEL

The topmost panel on the left side of Pipeline Control is the Pipeline State panel. Use the Pipeline State panel to determine the current state of the Pipeline you're connected to. The Pipeline State panel cannot be closed – it remains open and active at all times.

Figure 6–9. The status window displays current Pipeline activity.

Status. Displays status messages in preview, idle, and capture mode.

The Pipeline State panel displays the current Pipeline activity: idle, closing connection, establishing a connection, previewing, capturing, preparing, playing out, etc.



USING THE VIDEO PREVIEW PANEL

The Video Preview panel displays video during preview and capture operations (converting an SDI signal to a digital media file) with the current timecode in HH:MM:SS:FF format. VTR controls are directly below.

To open or close the Video Preview panel, click the expand/collapse arrow (top left corner of the panel).

Disable preview by closing the panel to decrease CPU load during capture.

You can also play local clip files (events that have already been captured) in the document. Hover over the event and select Play.

Figure 6–10. Use the Video Preview panel to view the incoming video stream.



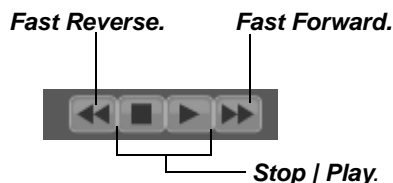
When video is being encoded and streamed from the Pipeline, you can preview the media.

Use the aspect ratio buttons under the Video panel to display video at the correct aspect ratio.

VTR Deck Controls

Use the VTR controls to preview video from the deck, connected via RS-422. The exact performance depends on the implementation of buttons on the deck itself. For example, Fast Forward on one deck may advance the tape at a different speed than Fast Forward on another deck.

Figure 6–11. Use VTR controls to preview video from your attached deck.



Fast Reverse. Click to rewind the tape.

Stop. Click to stop the deck.

Play. Click to play video at normal forward speed.

Fast Forward. Click to roll tape forward.



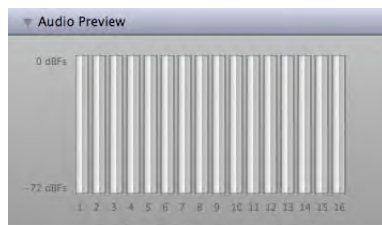
Jog Wheel

Jog. Click and hold the mouse button as you move the mouse in a circular motion to roll the tape forward or reverse, frame by frame.

USING THE AUDIO PREVIEW PANEL

Use the Audio Preview panel when playing video to view the decibel output of up to 16 channels of audio. To open or close the Audio Preview panel, click the expand/collapse arrow at the top left corner of the panel.

Figure 6–12. The Audio Preview panel displays decibels in real time for each audio channel.



The scale of the meter is -72 dBFS to 0S dBFS.

Disable preview by closing the panel to decrease CPU load during capture.

LOADING AND SAVING CLIP LIST FILES

In all capture-oriented documents (not the Print-to-Tape document), Pipeline Control enables you to load the clip list from an EDL or a Final Cut Pro XML Interchange file. You can also save a clip list you've made, in XML format. Loading and saving clip lists via files promotes interchange between applications and systems, without manually re-creating them. These interchange files can be used for time-shifting your work, to avoid performing the same actions multiple times, or to participate in workflow tasks with others.

For example, one person can define a list of clips, save the list as an XML file, and then pass the file on to someone else on the network who performs the actual capture.

To load a clip list, use one of the following menu items:

File > Import GVG 4 EDL. Select to populate the clip list with entries from a Pipeline EDL file. Make sure your Pipeline configurations are set prior to importing your EDL.

File > Import Final Cut Pro XML. Select to populate the clip list with entries from an EDL file in Final Cut Pro XML Interchange Format.

Pipeline Control displays an open dialog. Navigate to the location where the file you want to open is stored, select it, and click Open to load the clip list.

You can also save clip list entries as a file in Final Cut Pro XML Interchange Format.

File > Export Final Cut Pro XML. Select to save the clip list in Final Cut Pro XML Interchange Format.

Pipeline Control displays a Save dialog. Enter the name of the file to save, and select the location where you want to save the file. Click Save to save the clip list in XML Interchange Format.

XML Interchange Format can be generated from Final Cut Pro, or any other application that supports this format. XML Interchange Format is the file format that Pipeline import/export or capture/playout programs



load from and save in, in order to promote interoperability with other applications. Clip list files can also be generated and edited manually.

For further details, refer to Apple's documentation on XML Interchange Format:

http://developer.apple.com/documentation/AppleApplications/Reference/FinalCutPro_XML/AboutThisDoc/chapter_1_section_1.html

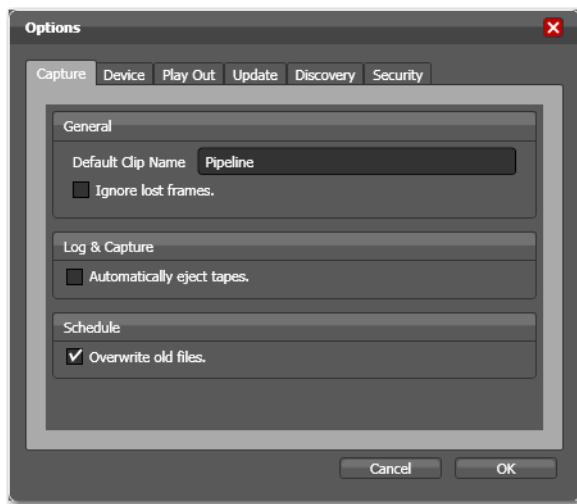


SETTING UP PIPELINE CONTROL OPTIONS

Select Tools > Options to set up Pipeline Control the way you want to use it.

Capture Tab

Figure 6–13. Capture Options



Default Clip Name. Enter the phrase to use as the root name for new video files.

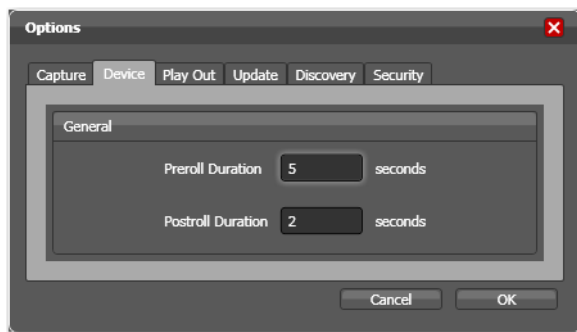
Automatically Eject Tapes. Check to have Pipeline Control eject the tape when capture is complete.

Ignore Lost Frames. When checked, a capture session continues even if frames have been lost. If unchecked, the capture session aborts when any lost frames occur.

Overwrite Old Files. When checked, Pipeline Control overwrites files in the same directory with new files without warning if they have the same name.

Device Tab

Figure 6–14. Device Options



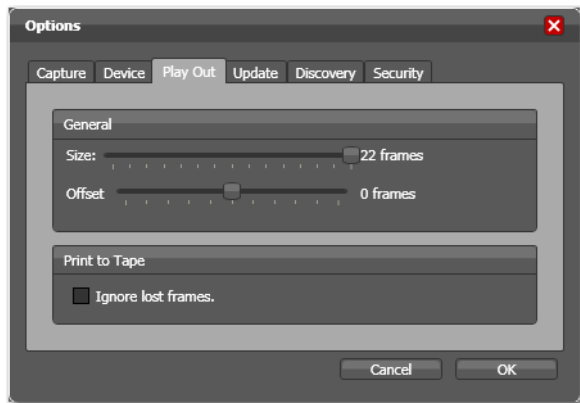
Preroll Duration. Specify the seconds to preroll video from start timecode during import operations.

Postroll Duration. Specify the seconds to postroll video from end timecode during import operations.



Play Out Tab

Figure 6–15. Play Out Options



Size. Set the queue size (number of frames). The minimum is 8 frames and the maximum is 22 frames. The default is 22 frames, in order to provide the most reliability.

During playout, the Pipeline queues frames in memory to compensate for network latencies. If queue size is set for a large number, it can 'ride out' higher transient latencies. However, a large number also introduces a longer delay between the time the frame is emitted and the time that the frame appears on the SDI connection (about 1/4 second for 8 frames, up to about 3/4 second for 22 frames).

If you are concerned with latency between the time video is exported from the computer and the time it is sent out the Pipeline, you should adjust the value lower. However, lowering this value makes the connection more susceptible to errors due to insufficient CPU power or network bandwidth.

Offset. Set the offset size (number of frames). The minimum is -5 frames and the maximum is +5 frames. The default is 0 frames.

Frames can occur early or late depending on the deck used. This adjustment offsets the playout based on the number of frames chosen and compensates for decks that are not 100% frame accurate to the timecode provided. This adjustment is made by a process of trial and error.



Note

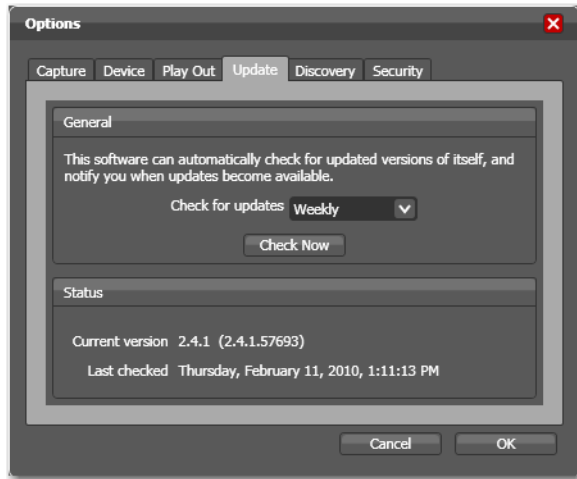
Not Applicable to Crash mode playout.

Ignore lost frames. Check this option to force Pipeline to ignore all lost frames. When unchecked (normal mode) Pipeline halts and alerts the user when a frame is lost.



Update Tab

Figure 6–16. Update Options



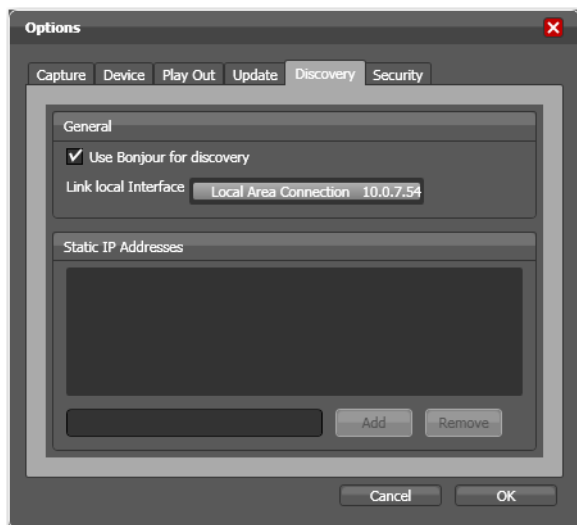
The Update panel enables you to determine which version of Pipeline Control is installed, when it was last checked, and when to check for updates from the Telestream Web site.

Check for Updates. Select Daily, Weekly, Monthly, or Never, to check for application updates.

Check Now. Click Check Now to check Telestream's Web site for application updates right now, and let you know if Pipeline is up to date or updates are available.

Discovery Tab

Figure 6–17. Discovery Options



Use Bonjour for Discovery. Check when you want Bonjour to automatically provide a list of Pipelines, which you can view when you browse, by clicking the Pipeline dropdown list in the Pipeline panel.



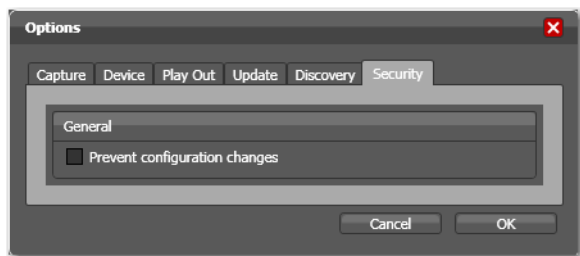
Link Local Interface. In most circumstances, Bonjour utilizes the correct link local interface from the NIC card on your computer. If you have more than one NIC card or active interface, you may have to select the correct interface for Bonjour. Bonjour does not operate over routers and gateways, so this feature does not enable you to access Pipelines beyond the link local interface – over a VPN, for example.

Static IP Addresses. If you have Pipelines that you must access and they are not accessible via Bonjour, you can add them manually. To add a new Pipeline to the Pipeline dropdown list, enter the IP address of the Pipeline in the text field at the bottom left, then click Add. To remove a Pipeline from the list, select it and click Remove. Click OK to update the list and close the Options window.

Now, when you click the Pipeline dropdown list in the Pipeline panel, it will display the Pipelines you added manually. Capture performance may be problematic when connecting to Pipelines via routers and gateways.

Security Tab

Figure 6–18. Security Options



Prevent Configuration Changes. Check to prevent users from altering Pipeline settings without knowing the password. Pipeline Control prompts you for a password. Now, when you open a document (even a new one), you can use it and make changes to the document itself, but you can't change Pipeline settings.

To turn this security feature off, uncheck Prevent Configuration Settings, supply the appropriate password, and click OK.



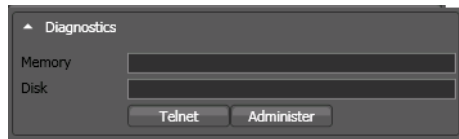
USING THE DIAGNOSTICS PANEL

The diagnostics panel provides easy access to a Pipeline device's diagnostic and administration interfaces for trouble shooting and technical support. The diagnostic panel provides debugging information about Pipeline hardware and Pipeline Control that may be useful to Telestream Customer Service ([Obtaining Pipeline Support | Information | Assistance \(page i\)](#)).

For more details on troubleshooting, see [Gathering Information for Troubleshooting \(page 159\)](#).

To display or hide the diagnostics panel, click the collapse/expand arrow in the Diagnostics Panel title bar.

Figure 6–19. Diagnostics window provides advanced information.



During capture operations, emptier is better; during playout operations, fuller is better. The RAM meter displays the percentage of the video or audio (whichever is more full) frame buffer that is currently full, as well as a high-water mark that displays the largest size the buffer has been in the last five seconds.

During normal operations, the meter displays green. If the meter displays yellow, marginal conditions exist; red indicates that Pipeline Control is likely to underflow/overflow the buffer, which will cause the current operation to abort.

If disk buffering is enabled (available for certain wrapper formats), the Disk meter displays how much data (as a percentage) is remaining to be transferred to its final destination (see [Disk Buffering](#), below). When this grows, it indicates that Pipeline Control is no longer able to write to the final destination at the same speed it is receiving the data, which is usually caused by a network or I/O issue.

Telnet. Click the Telnet button to display the Telnet 911 output being generated by the Pipeline. This information can be used to diagnose issues if required.

Administer. Click Administer to launch Pipeline Direct in your Web browser.



STORAGE MODELS AND FILE FORMATS/WRAPPERS

Storage Models

The Pipeline's application software implements a variety of media wrapper formats. These wrapper formats are described below and include TIFO, QuickTime (Open and Closed), Avid AAF+MXF, MXF OPAtom, MXF OP1a, XDCAM MXF OP1a.

Each wrapper format has different requirements of, or assumptions about the storage system used to capture and playback the media.

The storage requirements and application of a wrapper format are collectively defined by a storage model. This section describes the storage models used by the Pipeline application.

Direct Attached Storage (DAS) Model

This storage model is employed by wrapper formats that require:

- The ability to seek to random points within the file.
- The ability to disable or control the zero-fill behavior of the file system.
- No buffering by the application to achieve optimal I/O performance.

Storage Area Network (SAN) Model

This storage model is used in high performance capture applications. Wrapper formats that implement this model make the following assumptions:

- The wrapper file can be sequentially constructed.
- Optimal performance is achieved by writing to the file in large (> 1 MB) sequential blocks.
- The zero-fill behavior of the file system cannot be disabled.

Network Attached Storage (NAS) Model

This storage model is used in applications where the capture destination is a network attached file system (NFS, Samba, etc.) and when the network bandwidth or performance of that file system is unpredictable.

In this model the media is captured to a temporary file with the assumptions defined by the SAN model. The temporary file is then sequentially (and concurrently) delivered to the target file system as network bandwidth allows. When the media is successfully delivered to the target file system the temporary file is removed.

This storage model requires to be enabled by selecting Disk Buffering within the Wrapper selection dialog.

Format Wrappers

Pipeline Control supports several industry-standard and proprietary wrappers: TIFO, QuickTime (Open and Closed), Avid AAF+MXF, Generic MXF, and XDCAM MXF.



Telestream Intermediary Format (TIFO)

Telestream Intermediary Format (TIFO) is an intermediate media wrapper format designed by Telestream as a uniform, interchangeable file format to ensure interoperability among Telestream's media processing solutions, including FlipFactory, Episode, and Pipeline. TIFO provides a lightweight, low-overhead wrapper that is essence-agnostic, with out-of-band metadata, timecode, and closed caption support.

Using TIFO improves the ability to move media files between Telestream's media processing solutions with all media essence elements and metadata intact, preserving the widest range of transcoding options.

Workflow Considerations

TIFO format should be used when you are encoding your files for use with FlipFactory or Episode. TIFO files are unique, in that they can be transcoded as they are being captured in FlipFactory and Episode Engine, enabling you to create multiple output files in real-time. TIFO files can be processed by Episode Desktop when they have been closed. TIFO files can also contain metadata such as closed captions and timecode, which can be processed by FlipFactory or Episode.

Storage Model. TIFO wrapper implements the SAN and NAS storage models ([Storage Models on page 88](#)).

Table 6–9. TIFO Format Summary

Video	SD, Motion JPEG-A, DV, DVCPro, IMX, MPEG2-I, DVCProHD, AVC-I, ProRes, DNxHD
Audio	16 channels, 16/24 bit, 48 kHz
Timecode	Video sample header
Closed captions	Video sample parameter ("ATOM")
Ancillary data	Video sample parameter ("ATOM")

Usage Considerations

TIFO files are a Telestream proprietary format and are not playable or readable by non-Telestream applications. You should only use TIFO format if your workflow requires processing by Telestream workflow automation applications. The maximum length of a TIFO file captured in Pipeline Control is 9 hours.

QuickTime (Open)

Workflow Considerations

QuickTime (Open) files created by Pipeline Control can be edited in Final Cut Pro as they are being captured. Because of this characteristic, the length specified in the QuickTime file header is set at the beginning of the capture event. If the captured event stops before the event's predetermined time, the QuickTime file still retains the initial length.



Use Open QuickTime files if you will be editing or reviewing (playing out in QuickTime player) while capturing. Be aware of the disk I/O implications of this workflow by reading [Typical Pipeline Systems and Considerations \(page 29\)](#).



Note

When writing files to a shared folder on a Windows computer, the security settings must allow full read/write for the user accessing the file for edit.

Storage Model. QuickTime Open wrapper implements the SAN and NAS storage models ([Storage Models on page 88](#)).

Table 6–10. QuickTime Open Format Summary

Video	SD, Motion JPEG-A, DV, DVCPPro, IMX, MPEG2-I, DVCPProHD, AVC-I, ProRes, DNxHD
Audio	16 channels, 16/24 bit, 48 kHz, 1/2 channels per track
Timecode	Timecode ('tmcd') track
Closed captions	Closed caption ('clcp') track, EIA-608 caption data
Ancillary data	Essence storage only

Table 6–11. QuickTime Open Applicable Standards

Standard	Title
IEC 14496-14	MP4 File Format
	QuickTime File Format Specification

Usage Considerations

The maximum length of an open QuickTime file captured in Pipeline Control is 9 hours. Capturing an open QuickTime in a Trigger document without first specifying a duration results in a QuickTime file that reports a duration of 9 hours, no matter how long the actual recorded event is.

If 608 closed captions are available in the source during capture, they are automatically embedded into a QuickTime closed caption track. When played in QuickTime Player, the closed caption data is overlaid on the video by selecting View > Show Closed Captioning.

QuickTime (Closed)

Workflow Considerations

Closed QuickTime files can't be opened while they are being captured. Use closed QuickTime files if you will not be editing or reviewing (playing out in QuickTime player) while capturing. Use closed QuickTime files when crash recording an event, and a specific duration is not known in advance.

Storage Model. QuickTime Closed wrapper implements the SAN and NAS storage models ([Storage Models on page 88](#)).



Table 6–12. QuickTime Closed Format Summary

Video	SD, Motion JPEG-A, DV, DVCPro, IMX, MPEG2-I, DVCProHD, AVC-I, ProRes, DNxHD
Audio	16 channels, 16/24 bit, 48 kHz, 1/2 channels per track
Timecode	Timecode ('tmcd') track
Closed captions	Closed caption ('clcp') track, EIA-608 caption data
Ancillary data	Essence storage only

Table 6–13. QuickTime Closed Applicable Standards

Standard	Title
IEC 14496-14	MP4 File Format
	QuickTime File Format Specification

Usage Considerations

The maximum length of a closed QuickTime file captured in Pipeline Control is 9 hours. Capturing a closed QuickTime file in a Trigger document without first specifying a duration (or specifying a duration longer than 9 hours) always results in a 9-hour QuickTime file.

Avid AAF+MXF

Workflow Considerations

Avid AAF+MXF produces MXF Operational Pattern Atom (OPAtom) files compatible with Avid professional edit systems. Avid AAF+MXF can be used with DV25, DVCPro HD, IMX or DNxHD (VC-3) video essences. Avid AAF+MXF creates a unique set of files consisting of an AAF master clip file and individual MXF files for video and audio. The AAF file and associated media files can be delivered into separate folders that are specified in the Avid AAF+MXF selection dialog. Avid AAF+MXF files can't be opened while they are being captured.

Use Avid AAF+MXF when your workflow requires compatibility with Avid edit systems.

Storage Model. Avid AAF+MXF wrapper implements the DAS storage models ([Storage Models on page 88](#)).



Table 6–14. Avid AAF+MXF Format Summary

Video	DV, DVCPro, DVCProHD, IMX, DNxHD, AVC-Intra
Audio	16 channels, 16/24 bit, 48 kHz, PCM/Dolby E
Timecode	SMPTE 377M timecode track
Closed captions	Essence storage only
Ancillary data	SMPTE 436M ANC track/atom

Table 6–15. Avid AAF+MXF Applicable Standards

Standard	Title	Notes
SMPTE 377M-2004	Material Exchange Format (MXF)	
SMPTE 390M-2004	MXF Operational Pattern Atom	
SMPTE 382M-2007	Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container.	Each channel contained in a separate AES3 track/atom.
SMPTE 383M-2008	Mapping DV-DIF Data into the MXF Generic Container	Defines clip-wrapped DV-DIF essence.
SMPTE 386M-2004	Mapping Type D-10 Essence Data to the MXF Generic Container	Clip-wrapped D-10 is not defined (Avid is 2KB KAG padded, Apple is 512B KLV filled).
SMPTE 436M-2006	MXF Mappings for VBI Lines and Ancillary Data Packets	
SMPTE 2019-4-2008	Mapping VC-3 Coding Units into the MXF Generic Container	Defines clip-wrapped VC-3 essence.
SMPTE RP2008-2008	Mapping AVC Streams into the MXF Generic Container	Defines clip-wrapped AVC essence.

Usage Considerations

The Avid AAF+MXF file wrapper can't be used in conjunction with Pipeline Control's Disk Buffer feature. Take extra care when writing Avid AAF+MXF files to shared disk subsystems. See [Typical Pipeline Systems and Considerations \(page 29\)](#).

The maximum length of an Avid AAF+MXF file captured in Pipeline Control is 9 hours. When using a Scheduled Capture document, no event can exceed 9 hours. Capturing an Avid AAF+MXF file in a Trigger document without first specifying a duration results in an XDCAM file that reports the exact duration of the recorded event.

Generic MXF OP1a

Workflow Considerations

Generic MXF produces an MXF Operational Pattern 1a (OP1a, SMPTE 379M-2004) file with a generic container mapped to DV25, DVCPro HD, IMX or DNxHD (VC-3) video essence. Generic MXF files can't be opened while they are being captured.



Use Generic MXF when your workflow requires the video and audio essence to be wrapped in a single file meeting the SMPTE 379M-2004 generic MXF specification. To produce an MXF D-10 file use Generic MXF in conjunction with the IMX video codec.

Storage Model. Generic MXF OP1a implements both the SAN and NAS storage models. ([Storage Models on page 88](#)).

Table 6–16. Generic MXF Format Summary

Video	DV, DVCPPro, DVCPProHD	IMX	DNxHD, AVC-Intra
Audio	16/24 bit, 48 kHz		
	16 channels	8 channels	16 channels
	PCM/Dolby E	PCM	PCM/Dolby E
Timecode	SMPTE 377M Timecode track		
	SMPTE 385M System item		SMPTE 405M System item
Closed captions	Essence storage only		
Ancillary data	SMPTE 436M ANC track		

Table 6–17. Generic MXF Applicable Standards

Standard	Description	Note
SMPTE 331M-2004	Elements and Metadata Definitions for SDTI-CP	
SMPTE 377M-2004	Material Exchange Format (MXF)	
SMPTE 378M-2004	MXF Operational Pattern 1a	
SMPTE 379M-2004	MXF Generic Container	
SMPTE 382M-2007	Mapping AES3 and Broadcast Wave Audio into MXF Generic Container	DV (AES3), DNxHD (BWF)
SMPTE 383M-2008	Mapping DV-DIF Data into MXF Generic Container	DV
SMPTE 385M-2004	Mapping SDTI-CP Essence and Metadata into MXF Generic Container	DV, IMX
SMPTE 386M-2004	Mapping Type D-10 Essence Data to MXF Generic Container	IMX
SMPTE 394M-2006	System Scheme 1 for MXF Generic Container	DNxHD
SMPTE 405M-2006	Elements and Individual Data Items for MXF Generic Container System Scheme 1	DNxHD
SMPTE 436M-2006	MXF Mappings for VBI Lines and Ancillary Data Packets.	
SMPTE 2019-4-2008	Mapping VC-3 Coding Units into MXF Generic Container	DNxHD
SMPTE RP2008-2008	Mapping AVC Streams into MXF Generic Container	AVC-Intra



Usage Considerations

The maximum length of a Generic MXF file captured in Pipeline Control is 9 hours. Capturing a closed Generic MXF file in a Trigger document without first specifying a duration always results in a Generic MXF file that reports the exact duration of the recorded event.

XDCAM MXF OP1a

Workflow Considerations

XDCAM produces an MXF Operational Pattern 1a (OP1a) file compatible with Sony XDCAM MXF and is limited to DV25, and IMX video essences. XDCAM files can't be opened while they are being captured. Use XDCAM when your workflow requires the video and audio essence to be wrapped in a single file compatible with Sony XDCAM MXF. Use XDCAM MXF when capturing OP1a clips to be imported into an Avid system.

Storage Model. XDCAM MXF Op1a wrapper implements the DAS storage models ([Storage Models on page 88](#)).

Table 6–18. XDCAM MXF OP1a Format Summary

Video	DVCPPro	IMX
Audio	2 to 8 channels, 16/24 bit, 48 kHz	
Timecode	SMPTE 377M Timecode track	
	SMPTE 385M System item	
Closed captions	Essence storage only	
Ancillary data		SMPTE 385M Data item

Table 6–19. XDCAM OP1a Applicable Standards

Standard	Description	Note
SMPTE 331M-2004	Element and Metadata Definitions for the SDTI-CP	
SMPTE 377M-2004	Material Exchange Format (MXF)	
SMPTE 378M-2004	MXF Operational Pattern 1a	
SMPTE 379M-2004	MXF Generic Container	
SMPTE 385M-2004	Mapping SDTI-CP Essence and Metadata into the MXF Generic Container	DV, IMX
SMPTE 382M-2007	Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container	DV, HDV
SMPTE 383M-2008	Mapping DV-DIF Data into the MXF Generic Container	DV
SMPTE 386M-2004	Mapping Type D-10 Essence Data to the MXF Generic Container	IMX
SMPTE RDD03	eVTR MXF Interoperability Specification	DV, IMX
SMPTE RDD09	MXF Interoperability Specification for Sony MPEG Long GOP Products	HDV



Usage Considerations

The XDCAM file wrapper can't be used in conjunction with Pipeline Control's Disk Buffer feature. Take extra care when writing XDCAM files to shared disk subsystems. See [Typical Pipeline Systems and Considerations \(page 29\)](#).

The maximum length of an XDCAM file captured in Pipeline Control is 9 hours. Capturing an XDCAM file in a Trigger document without first specifying a duration always results in a XDCAM file that reports the exact duration of the recorded event.





CHAPTER 7

Using Scheduled Capture Documents

Use this chapter to learn how to use Pipeline Control to create schedules for capturing media from Pipeline. Capturing media on a schedule is achieved using the Scheduled Capture document in Pipeline Control.



Note

You can only play out schedule documents in Pipeline Control on Mac OS X.

Topics

- [Using The Scheduled Capture Document \(page 98\)](#)
- [About Schedules \(page 99\)](#)
- [Creating Capture Schedules \(page 100\)](#)
- [Using the Schedule Panel \(page 101\)](#)



USING THE SCHEDULED CAPTURE DOCUMENT

The Scheduled Capture (schedule, for short) document is designed to facilitate the creation of clip capture schedules.

Figure 7–1. Schedule window panels and toolbars.

Pipeline Settings Panel. Use to configure Pipeline for use in this schedule.

Schedule Toolbar. Provides buttons for frequently used functions.

Schedule/List View buttons.

Pipeline Status. Displays status.

Preview panel. Displays video.

Timecode. Displays when connected.

VTR Controls. Use to play video.

Audio Panel. Displays volume by channel.

Diagnostics Panel.

Activation Slider.

Schedule panel. Displays all clips in a timeline.

Event Timer. Indicates current time in schedule.

Schedule Details. Displays number of clips, total capture hours, and approx. space required.

Clip Events. Add these clip events to capture or play out video on schedule.



Pipeline Control displays several panels and toolbars to help you perform the tasks the document was designed to facilitate. Each panel, toolbar, and feature is described below.

The schedule document is composed of a 24-hour schedule panel (on the right), with Pipeline State, Video Preview, Audio Preview, and Diagnostics panels on the left. You can open multiple document at a time – each is displayed in its own tabbed window.



ABOUT SCHEDULES

A *schedule* is a list of one or more clip events to be processed in a recurring 24-hour period. Each schedule also has information about Pipeline selection and settings, and optional publisher specifications. Each schedule document is displayed in a different tabbed window. Because Pipeline Control is a multi-document application, you can open, edit, and execute several schedules (or other documents) at the same time. The number of media files you can capture or play out simultaneously is based on the power of the CPU and disk write speed in your computer and your network bandwidth ([Network and Hard Disk Performance Requirements on page 36](#)).

Creating Schedules. To create a schedule, select File > New Schedule to display a new schedule document. To save a schedule, select File > Save or Save as, name the document and select a folder to save it in. When you save a schedule, it is saved as a document. You can copy Pipeline Control documents and move them to other folders or other computers. You can work with Pipeline Control documents just like you do any other document.

When you close a schedule window, if it hasn't been saved before, you'll be asked to name it. If you've changed it, you'll be asked if you want to save changes



Note

Active schedules must first be deactivated to close them. You may be interrupting a clip event, so check first.

Each schedule contains several groups of information: the selected Pipeline and its settings, plus a list of one or more clip events arranged in a 24-hour timeline, their name and optional metadata, and publishers, if any. Pipeline Control uses the schedule information to execute each clip event (at the correct time) to either capture the clip or play out the clip (Mac OS X only).

Schedules are Symmetrical. That is, if you *capture* a given schedule, Pipeline Control runs the schedule and ingests encoded media from a specific Pipeline's SDI port based on the clip events you've created in the schedule, and saves it as a specific type of file, based on your settings. On Mac OS X, you can also *play out* the same schedule and the reverse occurs: each file you specify with a clip event is opened at the correct time and the media is played out to the specified Pipeline for decoding and playout as SDI.

You can create and configure as many schedules as you need to organize your Pipelines, workflows, and tasks efficiently. You might create schedules for each Pipeline you're using, or you might create schedules for a specific set of clips you need to capture or play out each day (or work shift). Or, you can create schedules based on how you want the media encoded, for use in an edit system, for example.

Pipeline Control will automatically reconnect a schedule document if network connectivity or video signal is lost, and continue processing events. If an event is being recorded or played out, the file (or output of the file) is invalid. If you uncheck Overwrite Files in Options, on a record schedule, a second file will be created for the remaining video in the file.



CREATING CAPTURE SCHEDULES

A *capture* schedule is a schedule with one or more clip events, which you use to capture SDI video in real time. The SDI video is converted to a specific media format, depending on the codec you specify in the Pipeline, and saved as a digital media QuickTime or TIFO file by Pipeline Control.

Here are the steps you'll take to create and use a capture schedule:

1. If Pipeline Control isn't running, start it now ([Starting Pipeline Control on page 63](#)).
2. Create a new, untitled Scheduled capture document (Select File > New Schedule) if one isn't open.
3. Select the Pipeline device which is supplying the video feed you want to capture ([Selecting a Pipeline \(page 69\)](#)).
4. Select the video codec and configure it to meet your video encoding requirements ([Selecting and Configuring a Video Codec \(page 73\)](#)).
5. Likewise, configure the audio codec to meet your audio encoding requirements ([Configuring the Audio PCM Audio Codec \(page 73\)](#)).
6. Specify your timecode clock source ([Selecting a Timecode Clock Source \(page 74\)](#)).
7. Select your wrapper (file) format ([Selecting a Wrapper \(page 70\)](#)), configure it, and specify the storage location where you want your media clips saved.
8. Set up handles as necessary ([Setting up Handles \(page 75\)](#)).
9. Optionally, select and configure a publisher to perform additional actions as part of a workflow ([Selecting a Publisher \(page 75\)](#)).
10. Save your schedule and name it, then continue.
11. Add one or more clip events to the schedule ([Creating Clip Events \(page 103\)](#)).
12. For each clip, enter a file name if you want it to be different than the default, and optionally, select a metadata label and enter metadata ([Editing a Clip Event's Property Sheet \(page 104\)](#)).
13. Save the schedule.
14. Click Capture to place the schedule into capture mode.

Pipeline Control displays the incoming video stream – verify the stream is what you expect. Pipeline Control waits for each clip event, and saves each clip as a file in the essence and format you specify.

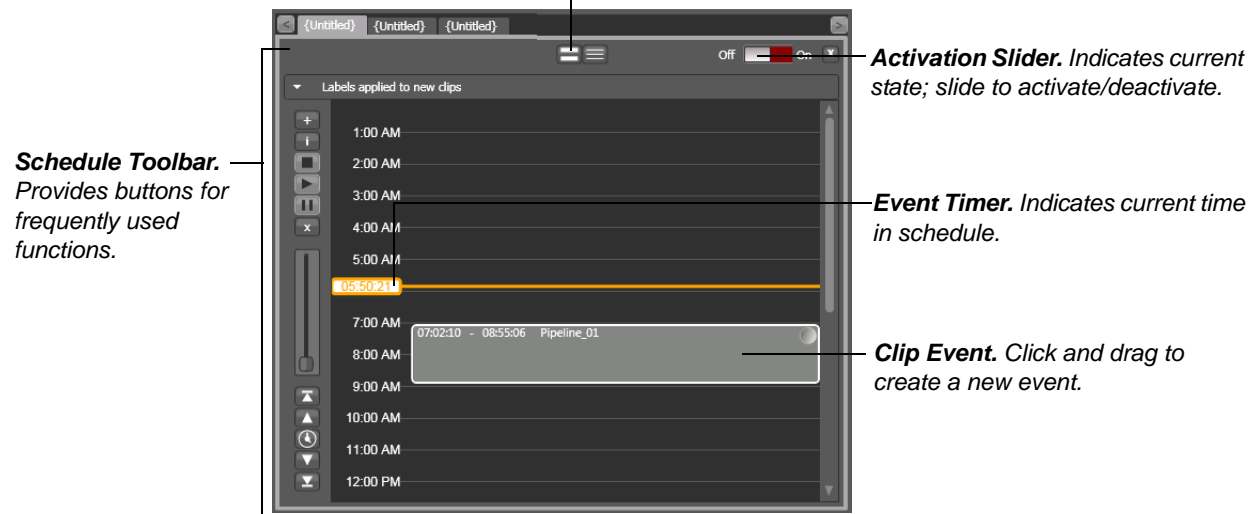


USING THE SCHEDULE PANEL

The schedule panel (on the right side of the window) is a vertically-oriented view of a 24-hour period. A time scale displays on the left, with space on the right to add clip events. The time is controlled by the timecode clock source you specify.

Figure 7–2. The schedule panel allows you to create clip events.

Schedule/List View. Click to display the full event list in schedule view or just display the list of clip events.



At the far left is a toolbar with buttons for frequently used functions. Above the event area is a Schedule/List view button that enables you to display the complete schedule or just a table of events.

Activation Slider. Click to activate (place the schedule in active mode) the schedule, when connected to a Pipeline. Clip events are captured as files as they occur in the schedule. In this mode, locks display on clips and you can't edit the schedule (add, edit, delete or play clips) or change your settings. When a clip event is executed, the current settings in the Pipeline Settings panel are used, even if they are not saved. Pipeline Control does not automatically save settings. To save settings, select File > Save.

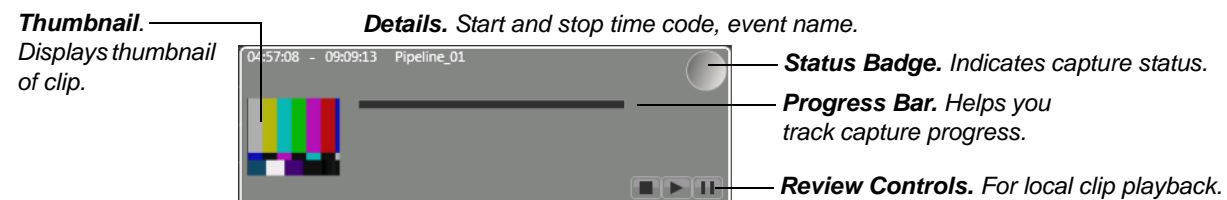
When you activate a schedule, Pipeline Control checks to make sure you have enough space for the clip events on your schedule.

For a schedule to remain active, the Pipeline Control application must be open and the Schedule document must also be open. If the Pipeline Control application or the Schedule document is closed, clip events aren't executed.

Clip Events

You add clip events by clicking and dragging the mouse downward in the schedule panel.

Figure 7–3. Clip events in your schedule provide details about the clip.



When you add a new clip event by clicking the Add Clip button, it is created on the nearest half hour.

You can resize a clip (up to 9 hours long) by dragging either the top or bottom and resizing it. When you resize a clip, it snaps to preset time lengths (half hour, quarter hour, five minutes, one minute, thirty seconds or ten seconds) depending on the magnification of the schedule.

To snap to present lengths at half the displayed timescale – for example, with the timescale displaying 1 minute increments, snap to 30 second increments – press the control key while resizing the clip. To snap the top time, control-click and drag the top of the event. You can zoom in to increase your view of the schedule with greater detail, and create smaller clip lengths. You can also edit the time down to the second by right-clicking the clip event and selecting Edit (or select the clip then select Clip > Edit) to display its property sheet.

Preview Thumbnail. Assigned when you created the mark-in point.

Status Badge. Status badge ([Table 7–1 on page 102](#)) to indicate the state of this clip.







Progress Bar. When capturing, colored yellow for captured and green for written to disk, indicating progress toward completion.

Review Controls. When file has been captured and closed, use these controls to view your clip locally.

Clip Status Badges

Each clip is marked with status badges to help you identify the state of each clip at a glance.

Table 7–1. Status badges and their descriptions.

Status Badge	Description
	Pipeline Control attempted to capture the clip, but failed. This may be due to lack of storage, network or Pipeline problems, or excessive pre-roll at the beginning of a tape, for example. Resolve the problem and retry.
	This clip is being closed. All media has been captured, but it has not been completely written to the file yet – possibly due to use of buffering.
	This clip event has not been captured yet.
	This clip is currently being opened/created, but no media has been captured yet.
	This clip is in the process of being captured.
	This clip has been successfully captured and the file has been closed.

Schedule Panel Keyboard Shortcuts

You can work with clips in your schedule using the following keyboard shortcuts:

Delete | Backspace. Deletes the selected clip event

Page Up. Select the previous clip event



Home. Select the first clip event

Page Down. Select the next clip event

End. Select the last clip event

Up Arrow. Move the selected clip up the schedule by the current block size (half hour, quarter hour, minute, thirty seconds, etc.), based on your current zoom increment.

Down Arrow. Moves the selected clip event down by the current block size.

Creating Clip Events

To add a clip event to a schedule, choose one of two actions:

- Move your cursor into the schedule panel and position it at the approximate start time. Now, click and drag downward for a maximum of 9 hours or until the end of the clip event (you can adjust the time accurately later) and release the button.

OR

- Click the Add Clip icon (the plus sign icon) at the top of the schedule toolbar or select Clip > Add.

Once a clip has been added to the schedule, you can drag it up and down the timeline to change the start/stop time. Or, open the property sheet (right-click and select Edit or select the clip then select Clip > Edit) and adjust the start and stop time. You can't create a single clip event lasting longer than 9 hours.

When clips are captured, they are saved in the folder specified by the storage location in your wrapper.

You can move a clip by clicking in the clip event and dragging it up or down. This avoids the necessity of moving a clip by adjusting both the start and stop times correctly. You can't overlap clip events on a schedule.

To play a clip that's been captured, use the review controls.

Deleting Clip Events

To delete a clip you've selected, choose one of these actions:

- Press the Delete key or the Backspace key.
- Click the X icon to the left of the schedule
- Right-click and select Clear from the context menu.

Once a clip has been placed on the schedule, you can drag it around to change their times. Or, you can open the property sheet and adjust their start and stop time. You can't create a single clip event lasting longer than 9 hours.

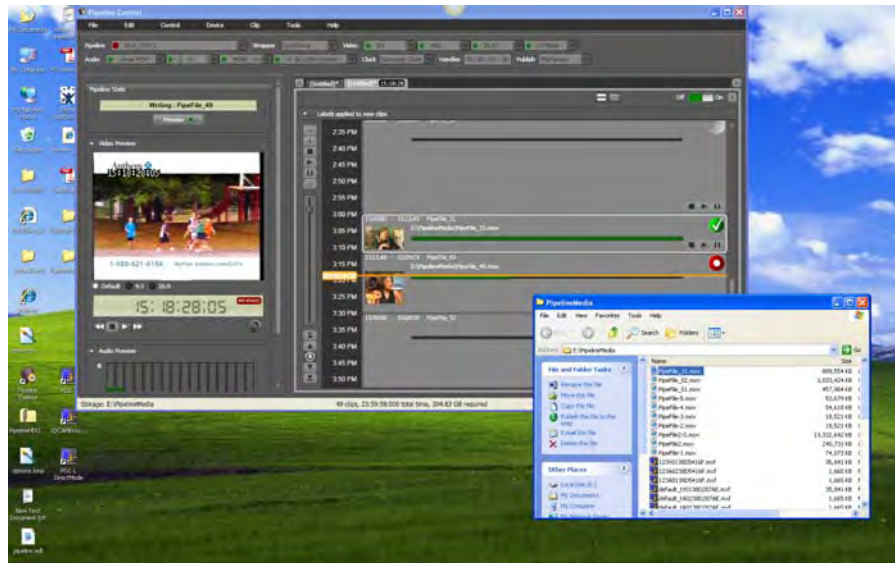
Showing Media on Your Desktop

When an event is connected to a local file, you can open the folder that contains the file directly.

Pipeline Control sends a command to the operating system to display the clip in the enclosing folder:



Figure 7–4. Pipeline Control displays the video clip's folder.



Editing a Clip Event's Property Sheet

Each clip event has its own property sheet. To display a clip event's property sheet:

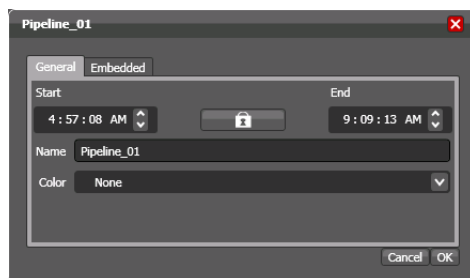
- Select the event and select Clip > Edit
- Select the clip and click the *i* icon in the toolbar to the left of the timeline
- Right-click to display the context menu and select Edit.

Properties are displayed in General and embedded tabs, and other metadata tabs based on publishers.

Viewing and Updating General Properties

To view or update the general properties of an event, select the clip, then select Clip > Edit. Click the General tab to display this sheet. Or, hover over the event – right-click to select Edit on the context menu.

Figure 7–5. Clip event general properties.



Start and End Time. Edit the digital clock to adjust the start and end times of the clip event.

Lock. Click the lock (to display the locked icon) to cause Pipeline Control to adjust the start or end time while maintaining the duration. Click again (to display the unlocked icon) to modify the duration.

Name. Select the name of the clip from the menu, or enter it in the text field.



Color. Select a color to use when displaying this clip event in the schedule panel.

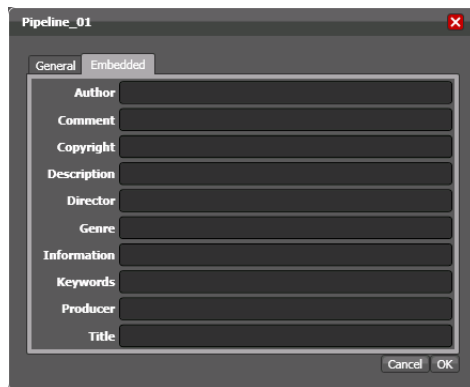
Click OK to save your changes or click Cancel to leave them unchanged.

Viewing and Updating Metadata Labels

To view or update the label values of a clip event, edit the clip. Then click the Labels tab you want to display this sheet (there may be more than one metadata label). The Embedded label is always available; others (including FlipFactory labels, Final Cut Pro, and QuickTime) are displayed as appropriate.

Values you enter in the Embedded label are stored directly in the file that is created.

Figure 7–6. Clip event label values.



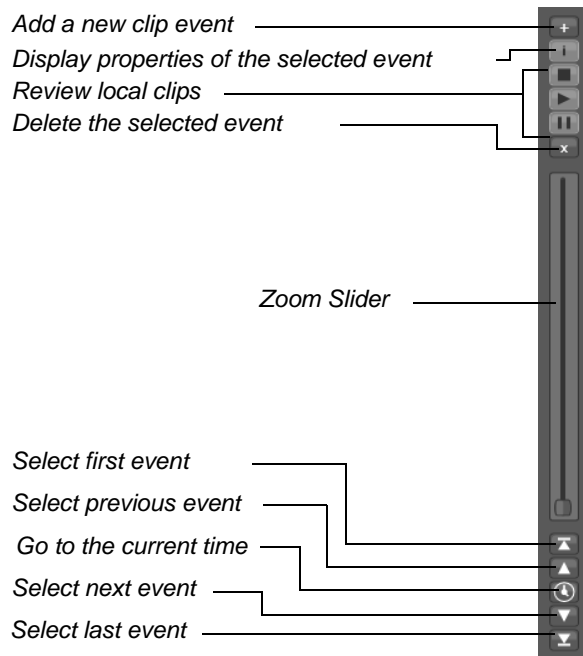
Click OK to save these values or click Cancel to leave them unchanged.

Using the Schedule Toolbar

The schedule toolbar displays vertically, on the left of the schedule panel. It provides easy access to various schedule commands you use to create and manage clip events.



Figure 7–7. Schedule Toolbar.



Add Clip. Use to add a new clip event. Each time you add an event, it is added as early in the schedule as possible, where space is available. The newly-created clip is automatically selected so that you can immediately display its properties and add metadata, or adjust start and stop times.

Information. Click to display the property sheet for the selected clip.

Review. Play the local clip (after its been captured) of the selected event in the Video Preview panel.

Delete. Click to remove the selected clip event from the schedule. When you remove a clip event, the actual file that it references (if present) is left intact – it is not deleted.

Zoom. When you zoom out all the way, on most monitors you can view the entire schedule from an hourly perspective. As you zoom in closer and closer, you can view half and quarter hours, 5 minutes, one minute. Zoom to the magnification that is best for the size of clips you're working with.

You can also zoom the schedule by repeatedly clicking the left arrow (to zoom out) or right arrow key (to zoom in).

Select and show the first event. Click to select and zoom in on the first event in the schedule.

Select and show the previous event. Click to select and zoom in on the event immediately prior to the currently-selected clip.

Go to Current Time. With the time source (Auto, RS-422, etc.) and Pipeline selected, click to scroll the schedule so that the current time is as close to the center of the schedule as possible, so that it is visible. If you are not connected to a Pipeline device, Pipeline Control displays the schedule beginning at midnight.

Select and show the next event. Click to select and zoom in on the next event after the selected clip.

Select and show the last event. Click to select and zoom in on the last event in the schedule.



CHAPTER 8

Using Log & Capture Documents

You can use Log & Capture documents in Pipeline Control to create and save clip lists, and capture media defined by the clips in various formats via Pipeline, independently of your video editing/encoding software.

You can capture and encode clips in any supported SD or HD essence and file format/wrapper.



Note

When capturing media from Pipeline Quad, you can perform confidence monitoring to qualify your video. See [Confidence Monitoring \(page 49\)](#).

Topics

- [Creating Clip Lists for Log and Capture \(page 108\)](#)
- [Using the Log & Capture Document \(page 109\)](#)
- [Using Log & Capture Controls in the Preview Panel \(page 110\)](#)
- [Using the Clip List Panel \(page 111\)](#)
- [Loading and Saving Clip List Files \(page 81\)](#)



CREATING CLIP LISTS FOR LOG AND CAPTURE

To encode and capture media clips from Pipeline, follow these steps:

1. **Create New Log & Capture Document.** If a Log & Capture document isn't open, select File > New Log & Capture to create a new, untitled Log & Capture document or open an existing Log & Capture document.

The Clip List panel, on the right, includes the General Tab for mark-in and mark-out points, metadata tabs, plus the clip list at the bottom. For details, see [Using the Clip List Panel \(page 111\)](#).

2. **Select and Configure your Pipeline.** If you haven't already selected and configured Pipeline for this task, do so now. After configuring Pipeline for your workflow requirements, save the file. For details, see [\(Using The Pipeline Settings Panel \(page 69\)\)](#).
3. **Preview your Media Stream.** When you connect, streaming media (if present) displays in the video panel. If you're connected to a VTR and it is in Remote mode, you can control your video using the VTR controls directly in Pipeline Control.
4. **Create a Clip List.** Insert tapes in your VTR, then use the VTR controls to scrub media, create mark in and mark out points (General Tab), add metadata as necessary, then click the Log button to create the clip and add it to the list.

If you want to capture clips from multiple tapes, enter the name of the tape (or category) in the General > Tape field for the clip you're creating. Before capturing clips, select the tape (or category) from the clip list on the left, to display the clips you want to capture. You can use the tape name to filter your list. Alternatively, import an EDL to automatically create your clip list. (See [Loading and Saving Clip List Files \(page 81\)](#) for details.)

5. **Capture the Clips.** Click the Activation slider (top right) to activate the document and capture the clips displayed in the clip list and save each one as a file. To capture clips from multiple tapes in one session, select All Tapes (Click the word *All*) before activating the document to capture your clips. You will be prompted to insert the correct tape when necessary and (if selected in preferences) the previous tape will be ejected.



USING THE LOG & CAPTURE DOCUMENT

The Log & Capture document is designed to facilitate logging and capturing clips.

Figure 8–1. Use the Log & Capture window to create clip lists and capture media from Pipeline.



Pipeline Control displays several panels and toolbars to help you perform the tasks the document was designed to facilitate. Each panel, toolbar, and feature is described below.

For details on how to use the Pipeline Settings panel and all panels and controls on the left, see [Chapter 6, Using Pipeline Control \(page 61\)](#).

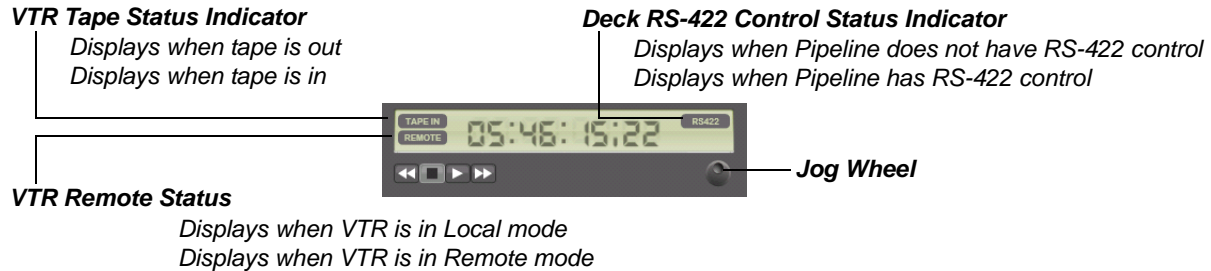
The log and capture document is composed of data entry tabs and a clip list (on the right), including tape names when logging clips from multiple tapes, with Pipeline State, Video Preview, Audio Preview, and Diagnostics panels on the left. You can open multiple document at a time – each is displayed in its own tabbed window.



USING LOG & CAPTURE CONTROLS IN THE PREVIEW PANEL

In addition to the panels and controls described in ([Using The Video Preview Panel on page 80](#)), the Preview panel in Log & Capture window has additional controls to support log and capture activities.

Figure 8–2. Timecode, VTR, jog wheel & control status indicators in the Log & Capture window.



VTR Tape Status

Tape In. Displays when a tape is in the attached VTR.

Tape Out. Displays when a tape is not in the attached VTR.

Deck RS-422 Control Status

NO RS-422. Displays when Pipeline does not have control over the attached VTR.

RS-422. Displays when Pipeline has control over the attached VTR.

VTR Remote Status

LOCAL. Displays when the VTR is in Local mode.

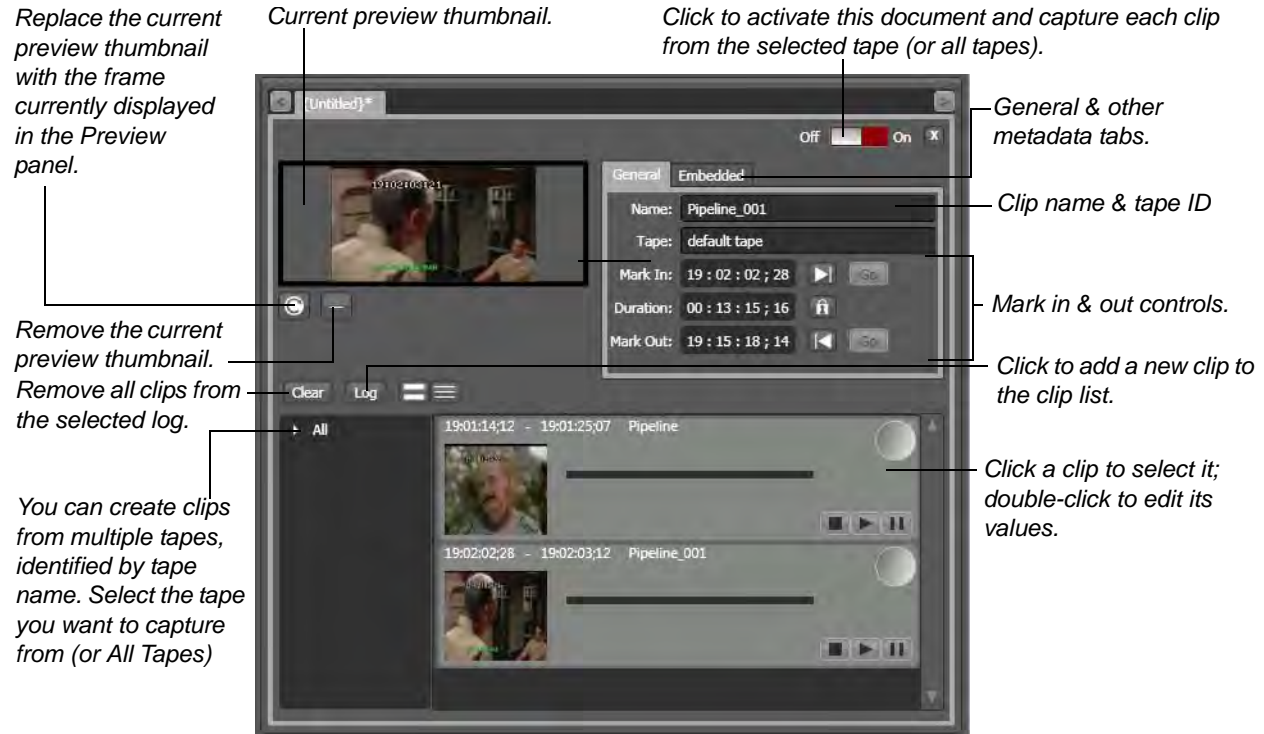
REMOTE. Displays when the VTR is in Remote mode.



USING THE CLIP LIST PANEL

The Clip List panel displays on the right of the Log & Capture window – it includes the General Tab for mark-in and mark-out points, metadata tabs, plus the clip list. Each of the tabs holds metadata for the selected clip.

Figure 8–3. The Clip List panel allows you to work with and capture clips.







General Controls and Detail Fields

The following controls in the General tab perform certain functions or contain details about the clip:







Control	Description
	<p>Located at upper right, slide the activation slider to the right (to activate the document) when you're done creating or modifying your clip list. Activate your document to capture the clips for the selected tape or all tapes and save the files. Slide to the left to deactivate the document – stopping any capture in progress – when you want to edit the document or close it.</p> <p>Pipeline Control captures clips by controlling the VTR via the Pipeline to encode the clip and stream each clip's media to Pipeline Control, which writes the media out to a file, and saves each file in the destination folder.</p> <p>When the capture process completes, Pipeline Control disconnects from the Pipeline.</p>
	<p>Located directly under the thumbnail frame, click to replace the current thumbnail frame with the frame currently displayed in the Video Preview panel.</p>



Control	Description
	Located directly under the thumbnail frame, click to remove the current thumbnail frame.
	Located below the thumbnail frame, directly above the clip list. Click to clear all clips from the selected tape.
	Located below the thumbnail frame, directly above the clip list, just right of the Clear button. Click to add the new clip to the clip list along with clip values and metadata. Make sure to use the correct tape name, if you're using multiple tapes.
	Located below the thumbnail frame, directly above the clip list. Click to switch between a clip view and a list view, depending on the task at hand.

Clip Status Badges

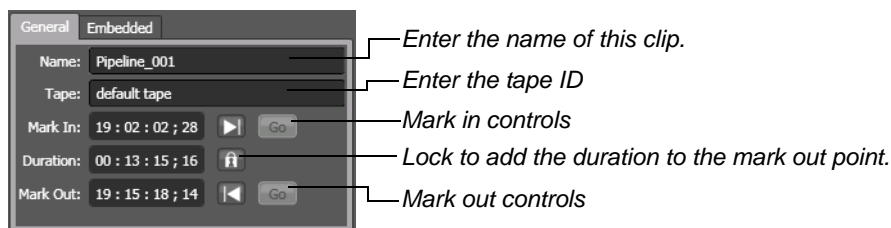
Each clip is marked with status badges to help you identify the state of each clip at a glance.

Status Badge	Description
	Pipeline Control attempted to capture the clip, but failed. This may be due to lack of storage, network or Pipeline problems, or excessive pre-roll at the beginning of a tape, for example. Resolve the problem and retry.
	This clip is being closed. All media has been captured, but it has not been completely written to the file yet – possibly due to use of buffering.
	This clip has not been captured yet.
	This clip is currently being opened/created, but no media has been captured yet.
	This clip is in the process of being captured.
	This clip has been successfully captured and the file has been closed.

General Tab Controls

Use the controls on the General tab to identify your clip, and set its in and out points.

Figure 8–4. Use the Embedded tab to ID your clip/tape & set mark points.



Name. Pipeline Control names the clips by default – Pipeline_001, 002, etc. You can enter any name you want. This value is used for the base file name.



Tape. Enter the tape name to organize clips by tape, if you're capturing from multiple tapes. These tape names display in the tree just to the left of the clips in the clip table. Tape names are not known by the deck of Pipeline Control, they are only used for human identification purposes.

Mark In. Click the arrow to update the Mark In point to the tape's current timecode for the selected clip. Or, manually enter the timecode. To go to the point, click the Go button.

Duration. Click to disengage the lock (black). The duration is calculated as the end time minus the start time. While the lock button is disengaged (black), changes to the start timecode will cause the end timecode to remain the same, and the duration timecode to change. Any changes to the end timecode will similarly cause the start timecode to remain the same and the duration timecode to change.

Click again to engage the lock (blue). Duration always stays the same. When the lock button is engaged (blue), changes to the start or end timecode leave the duration timecode locked – as is. If you change the start timecode, the end timecode will adjust to match the new start time and the locked duration. If you change the end timecode, the start timecode will adjust to match the new end timecode and the locked duration.

For example, given a clip at 29.97 fps, if the duration is set to 00:00:30;00 with the In point at 01:00:00;00, the Out point will be 01:00:29;29. If the In point is changed to 01:00:10;00 the Out point will change to 01:00:39;29. Likewise, if the out point is changed from 01:00:39;29 to 01:00:49;29 the In point will change to 01:00:20;00.

A blue lock does not mean that the duration fields are locked (not editable). When the lock is blue, the duration value can be changed manually by entering a new duration in the duration fields.

Mark Out. If you're not using the duration, click to update the Mark Out point to the tape's current timecode for the selected clip. Or, manually enter the timecode. To go to the point, click the Go button.

Viewing and Updating Metadata Labels and Embedded Metadata

To view or update the label values of a clip event, double-click in the clip title on the schedule; then click the Labels tab to display this sheet. There may be more than one metadata label. Next, select the label set you want to use from the menu on the right. The Embedded label is always available; others (including FlipFactory labels, Final Cut Pro, and QuickTime) are dynamically generated as appropriate.

Values in the Embedded label are embedded in the file that is created.

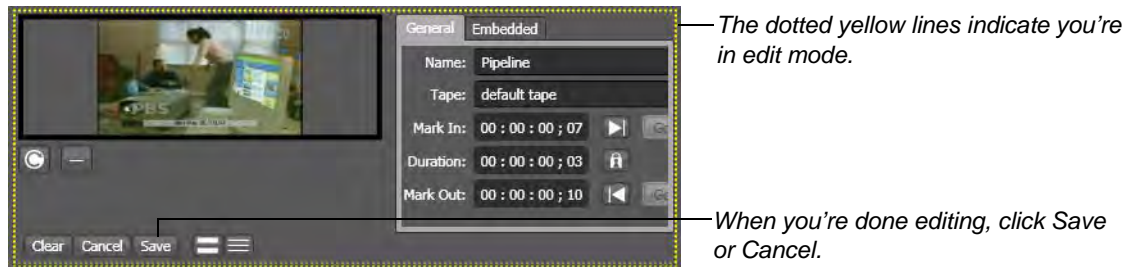
Figure 8–5. Use the Embedded tab to add metadata to your clip.

The image shows a software interface with two tabs: 'General' and 'Embedded'. The 'Embedded' tab is selected. Below the tabs is a list of metadata fields, each with a label and a corresponding text input field. The fields are: Author, Comment, Copyright, Description, Director, Genre, Information, Keywords, Producer, and Title. The input fields are currently empty.

Editing Clip Details

Clips can be viewed in clip view or list view – click the Clip or List view button at the top of the list to switch views. Click a clip to select it. Double-click a clip to edit it in place.

Figure 8–6. Double-click to edit clip details in the General and Embedded tabs in place.



When you're done editing click Save to save your updates or Cancel to discard them and return to view-only.

Performing Other Clip Tasks

There are a variety of actions you can take on a selected clip, when you right-click on it:

Clear. Select to permanently remove the clip from the list. Files associated with the event are not deleted.

Edit. Select to display an editor dialog, so that you can modify the properties of the clip.

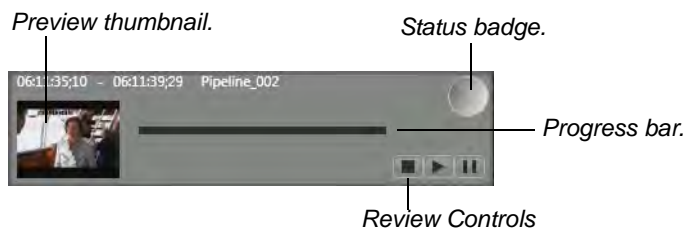
Show in Explorer. After the clip has been recorded, select to display the folder that contains the clip.

Recapture. After the clip has been recorded, select to re-capture the clip.

Using Clip View

In clip view (shown following), several controls are presented.

Figure 8–7. Use clip controls to review your clip.



Preview Thumbnail. Assigned when you created the mark-in point.

Status Badge. Status badges to indicate the state of this clip.

Progress Bar. When capturing, colored yellow for captured and green for written to disk, indicating progress toward completion.

Review Controls. When file has been captured and closed, use these controls to view your clip locally.



Creating a Clip

To create a clip, insert your tape, make sure the Pipeline is connected, and follow these steps:

1. Click the General tab to display mark-in and mark-out controls.
2. Play/scrub the video using the VTR controls, then click the Mark In button to mark the start timecode (at right of Mark In code value field in the General tab of the Clip List panel).
3. Click the Mark Out button to mark the end timecode (at right of end timecode value field). When you have a start and end timecode value (and the start timecode is previous to the end timecode).
4. Optionally, enter a start timecode and a duration – the end timecode will be calculated for you.
5. Optionally, enter metadata on the Embedded tab.
6. Click Log to create the clip and add it to the list.

When not in edit mode, any data entry or edits you perform in any tab is for the next clip you may create.

Deleting a Clip

To delete a clip, select it from the clip list and press the Delete key or select Clip > Clear.





CHAPTER 9

Using Trigger Documents

Pipeline Control's Trigger document enables you to manually or automatically record media in real time from a live source or VTR. You use the Trigger document to record media in real time from a VTR deck or live sources. You can perform the recording process in three ways: manually, automatically via Web services, or by using timecode breaks.

You use the Web services by writing an application using the Pipeline Web Services API, in any supported SD or HD essence and file/wrapper format, directly from a Pipeline that is attached via Ethernet.



Note

When capturing media from Pipeline Quad, you can perform confidence monitoring to qualify your video. See [Confidence Monitoring \(page 49\)](#).

Topics

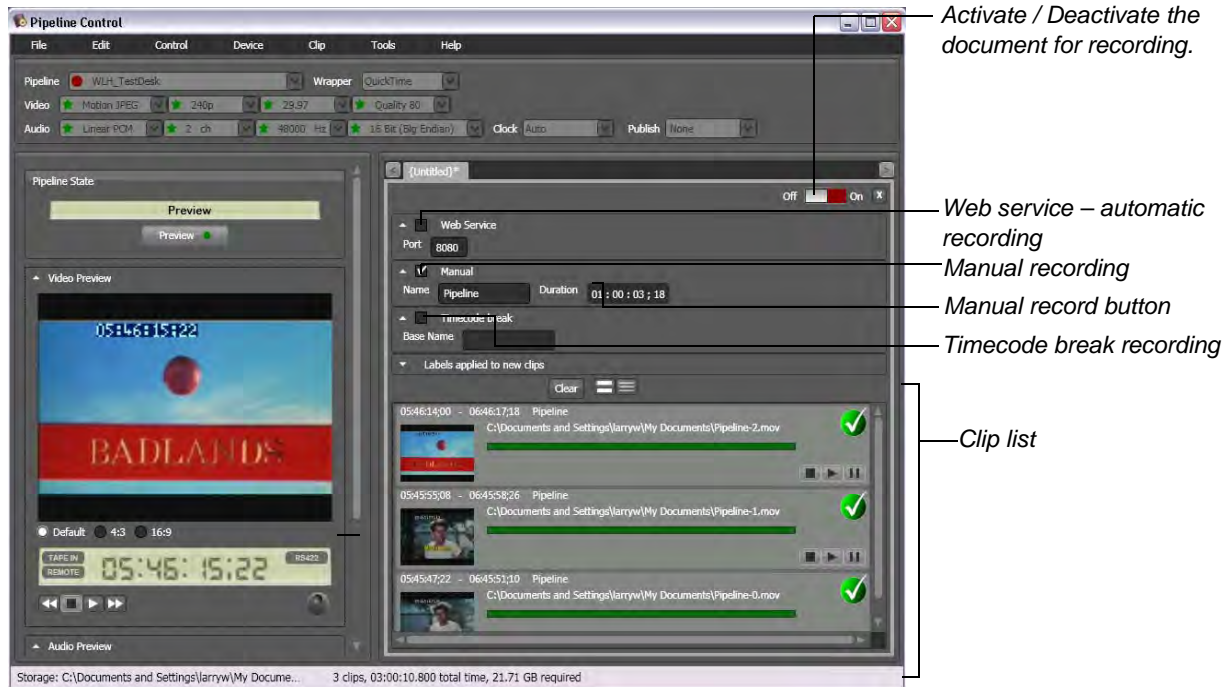
- [Using the Trigger Document \(page 118\)](#)
- [Using the Preview Panel \(page 118\)](#)
- [Using the Clip List Panel \(page 122\)](#)
- [Manually Recording Media \(page 120\)](#)
- [Setting up and Enabling Automatic Recording \(page 120\)](#)
- [Setting up and Enabling Timecode Break Recording \(page 121\)](#)



USING THE TRIGGER DOCUMENT

The Trigger document is designed to facilitate manual and automatic clip recording. Pipeline Control can record files of any supported profile in any format/wrapper, up to 9 hours in length.

Figure 9–1. Use the Trigger window to capture video in real time.



At the top is the Pipeline Settings panel, and to the left side is the Preview panel. For details on how to use the Pipeline Settings panel and other panels and controls on the left, see [Chapter 6, Using Pipeline Control \(page 61\)](#).

When your VTR is connected via RS-422 in remote mode, the VTR controls allow you to scrub media.

The right side is designed to support crash recording and automation. The clip panel has settings to enable and configure automatic, manual, and timecode-break recording. Below is the clip list, which displays a list of all clips recorded in this window.

Pipeline Control will automatically reconnect a Record and Automate document if network connectivity or video signal is lost, but it will not continue processing future events.

Using the Preview Panel

You can use the video and audio preview buttons to enable or disable audio and video preview from the video feed.



In addition to the panels and controls described in [\(Using The Video Preview Panel on page 80\)](#), the preview panel in the Trigger window has additional controls. If an optional VTR is attached, you can use the VTR controls to view VTR status, and in Remote mode, control it.

Figure 9–2. Jog and Shuttle in the Trigger window.

VTR Tape Status Indicator

Displays when tape is out
Displays when tape is in

Deck RS-422 Control Status

Displays when Pipeline does not have control
Displays when Pipeline has control



VTR Remote Status Indicator

Displays when VTR is in Local mode
Displays when VTR is in Remote mode

VTR Tape Status

Tape In. Displays when a tape is in the attached VTR.

Tape Out. Displays when a tape is not in the attached VTR.

Deck RS-422 Control Status

NO RS-422. Displays when Pipeline does not have control over the attached VTR.

RS-422. Displays when Pipeline has control over the attached VTR.

VTR Remote Status

LOCAL. Displays when VTR is in Local mode.

REMOTE. Displays when VTR is in Remote mode.



SETTING UP AND ENABLING AUTOMATIC RECORDING

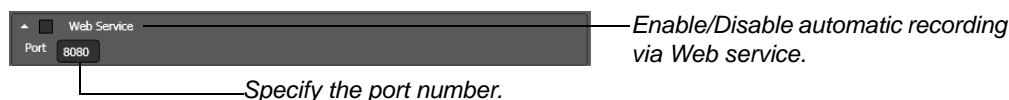
To set up automatic recording, which is performed by HTTP GET requests from another application, check Web Service. Then, connect the feed or insert your tape, make sure the Pipeline is configured and connected. After you've set up your configuration (details below), click Activate to enable automatic recording.

For details on using the Web service, see [Pipeline Web Service Version 2.1 API \(page 171\)](#).

Web Services and Port Number. Check Web services, and set the port number that the Web service should listen for incoming HTTP GET requests on. The port number value must be between 1025 and 49151, and the TCP port must be open on the host system and not blocked by a firewall.

You can record all formats and file wrappers in this manner, depending on your Pipeline settings. All files have a 9 hour maximum clip length.

Figure 9–3. Automatic Recording settings panel.



When the Web service is enabled and the Pipeline document is placed into an active state, the Web service begins listening for requests on the specified port. You're warned if the port is in use by another Trigger document or by some other service on the host computer.

Click the Activation slider to cause the Web service to begin listening for HTTP GET requests. You can send HTTP GET requests to Pipeline Control to start and stop recording in the active document, (plus status requests) from a Web browser or custom applications that you develop.

MANUALLY RECORDING MEDIA

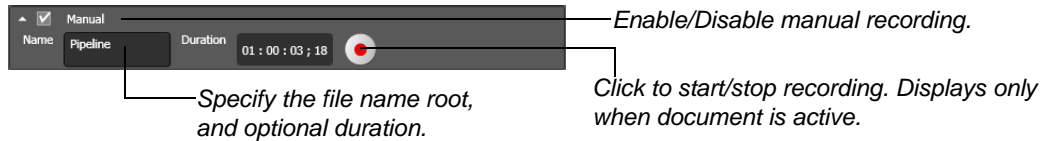
To manually record – encode and capture media – from Pipeline in real time, follow these steps:

- 1. Open a New Trigger Document.** If a Trigger document isn't open, select File > New Trigger Document to create a new, untitled Trigger document.
Or, you can open a previously-saved document.
- 2. Select and Configure your Pipeline.** If you haven't already selected and configured Pipeline for this task, do so now. After configuring Pipeline for your workflow requirements, save the file. For details, see [\(Using The Pipeline Settings Panel \(page 69\)\)](#).
- 3. Connect to the Pipeline.** When you connect, streaming media (if present) displays in the video panel. If you're connected to a VTR and it is in Remote mode, you can control your video using VTR controls.
- 4. Set up your live feed.** Connect your live feed or insert tapes in your VTR, then use the VTR controls to scrub the media to the starting point.



- 5. Enable Manual recording.** Check Manual to enable direct, user-control of this document. Specify the file name and optionally, enter a duration. Then, connect the live feed or insert your tape.

Figure 9–4. Manual Recording settings panel.



Name and Duration. In the Name field, enter a text phrase to name the root file name (not including the suffix). For additional files with the same root, Pipeline Control adds a unique number. Optionally, you can enter a duration for the amount of time Pipeline Control should record media to the file. Or, just click the Record button to stop recording when you choose.

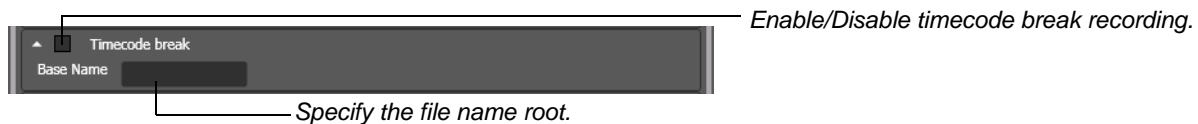
- 6. Capture the Video.** Click the Activate slider, then click the Record button to start recording. To start and stop recording using the Record button, enter 0 in the Duration field. When recording to a duration using Open QuickTime, if you click Stop previous to the duration value, the file will retain the original duration value.

When capture is complete, the file is closed and displays in the clip list.

SETTING UP AND ENABLING TIMECODE BREAK RECORDING

To set up timecode break recording, which is performed by timecode breaks in the feed, connect the live feed or insert your tape, make sure the Pipeline is configured and connected. After you've set up your configuration (details below), click Activate to enable timecode break recording.

Figure 9–5. Manual Recording settings panel.



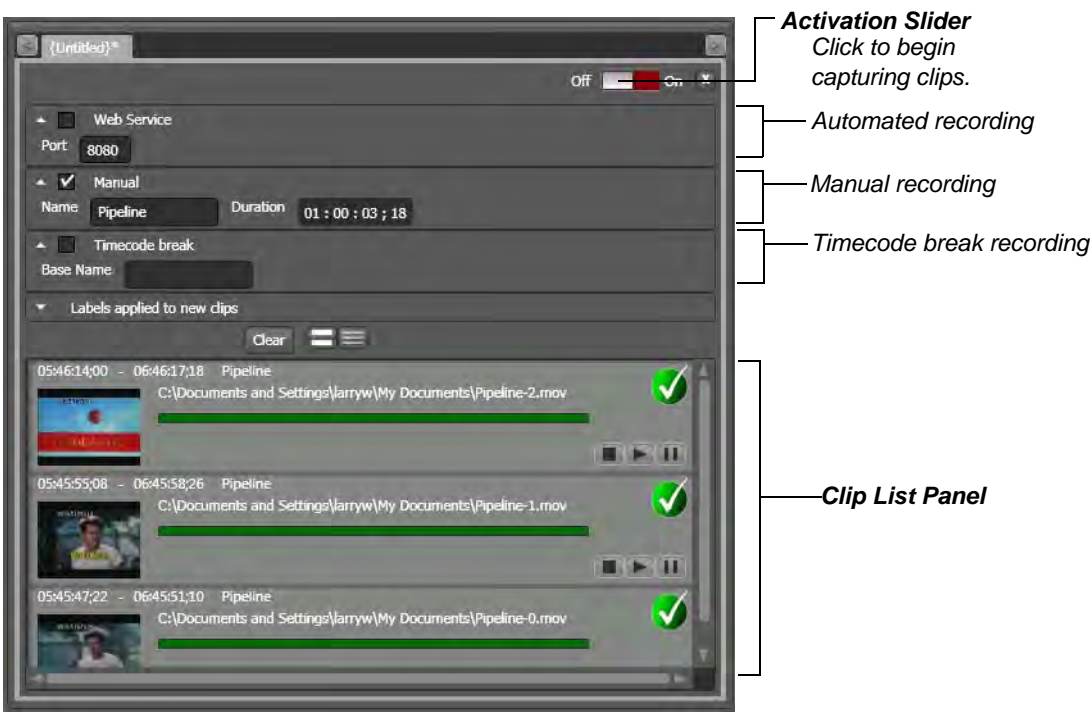
Base Name. In the Base Name field, enter a text phrase to name the root file name (not including the suffix). For additional files with the same root, Pipeline Control adds a unique number.



Using the Clip List Panel

The Clip List panel displays on the window’s right side. It displays controls to enable and configure recording methods, metadata labels, a Record button, and an Activate button.





Figure 9–6. Windows clip list panel.





Below the recording options is list of media clips you’ve recorded.

Clip Status Badges

Clip thumbnails are marked with status badges to help you identify the state of each clip at a glance.

Status Badge	Description
	Pipeline Control attempted to capture the clip, but failed. This may be due to lack of storage, network or Pipeline problems, or excessive pre-roll at the beginning of a tape, for example. Resolve the problem and retry.
	This clip is being closed. All media has been captured, but it has not been completely written to the file yet – possibly due to use of buffering.
	This clip has not been captured yet.
	This clip is currently being opened/created, but no media has been captured yet.



Status Badge	Description
	This clip is in the process of being captured.
	This clip has been successfully captured and the file has been closed.

Viewing and Updating Metadata Labels

To view or update the label values for each clip event, open the Labels.... section on the right panel; then click the respective tab to display each metadata sheet. There may be more than one metadata label.

Next, select the label set you want to use from the menu on the right. The Embedded label is always available; others (including FlipFactory labels, Final Cut Pro, and QuickTime) are dynamically generated as appropriate.

Values in the Embedded label are embedded in the file that is created.





CHAPTER 10

Using Print to Tape Documents

Pipeline Control's Print to Tape document enables you to implement various types of print-to-tape operations from media files played out via Pipeline to your VTR. You can use the Print to Tape document to specify a set of clips and perform assembly and insert edits or crash print to tape.

Topics

- [Playout & Print to Tape Overview \(page 126\)](#)
- [Creating Print to Tape Documents \(page 127\)](#)
- [Using the Clip Panel \(page 129\)](#)

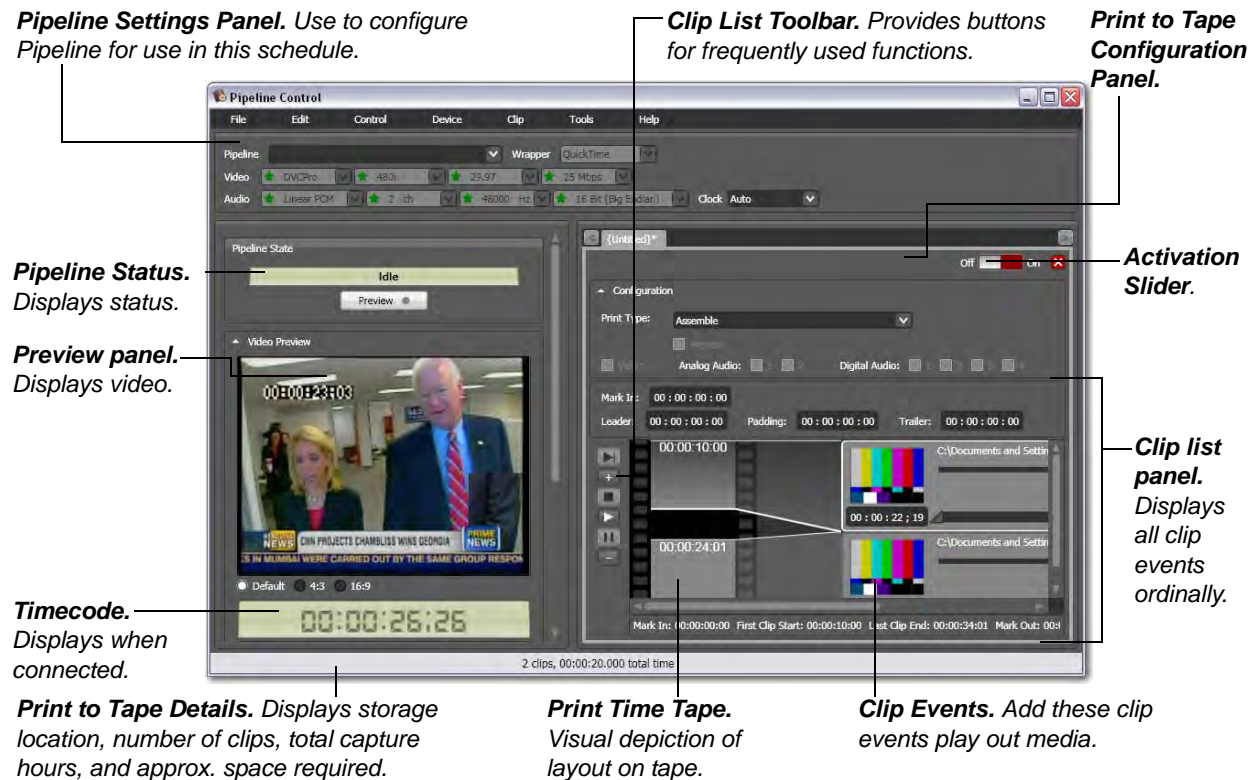


PLAYOUT & PRINT TO TAPE OVERVIEW

The Print to Tape document is designed to facilitate print to tape operations via Pipeline. You can set up the following print-to-tape operations:

- Assemble edits
- Insert edits
- Crash records.

Figure 10–1. Print to Tape window panels and toolbars.



At the top of the window is the Pipeline Settings panel, and to the left is the Preview panel. For details on how to use these panels, see [Chapter 6, Using Pipeline Control \(page 61\)](#).

When your VTR (or VTR-enabled camera) is connected via RS-422 in remote mode, VTR controls below the Preview panel enable you to scrub the tape.

The Print to Tape document panel (bottom right) displays configuration settings and timecode settings. Below the timecode settings is the clip list, which displays a list of clips you have added.

Pipeline Control automatically reconnects a Print to Tape document if network connectivity or video signal is lost when you are previewing the tape, but it will not reconnect if the document has been activated.



CREATING PRINT TO TAPE DOCUMENTS

A *Print to Tape* document contains one or more clip file events in QuickTime (mov) format, which you use to play out SDI video from Pipeline in real time. The video format is automatically detected, and decoded by the appropriate codec in the Pipeline, and played out under control of Pipeline Control.

Here are the steps you'll take to create and use a Print to Tape document:

1. **Open a New Print to Tape document.** If a Print to Tape document isn't open, select File > New Print to Tape Document to display a new, untitled Print to Tape document window.
Or, you can open a previously-saved document.
2. **Select your Pipeline.** If you haven't already selected your Pipeline for this workflow, do so now. After configuring Pipeline for your workflow requirements, save the file. For details, see [Using The Pipeline Settings Panel](#) (page 69).
3. **Select insert, assemble, or crash print type.** Select the type of operation you want to perform from the Print Type dropdown menu and configure your Preview, Video, and Audio settings.

Figure 10–2. Print to Tape configuration panel.



Preview. Check to test your clips, timecodes, and settings by playing out the entire set in the preview panel on the left, without performing the print to tape operation (available in Insert edit mode only).

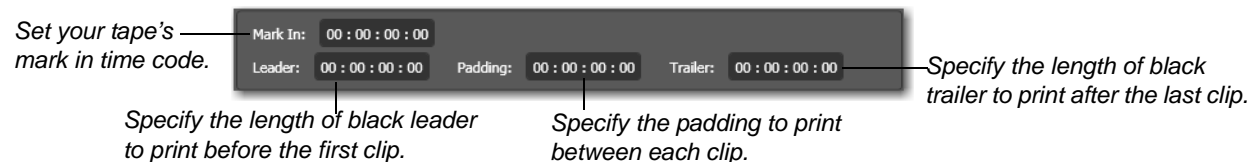
Video. Check to play out video (available in Insert edit mode only).

Analog Audio. Check audio flag 1 and/or 2 to route audio channels based on the deck configuration. (Available in Insert edit mode only).

Digital Audio. Check audio flag 1 and/or 2 to play out these channels (available in Insert edit mode only).

4. **Select insert, assemble, or crash Print Type.** Select the type of operation you want to perform from the Print Type dropdown menu and configure your Preview, Video, and Audio settings.

Figure 10–3. Print to Tape Timecode panel.



Mark In. Enter the timecode of the first frame on the tape where media will begin to be laid down.

Leader. Enter the length of black leader to play out before the first clip.

Padding. Enter the length of space to leave between clips as they are played out.

Trailer. Enter the length of black trailer to play out at the end of the last clip.



5. **Add your Clips.** Using the Clip panel, add your files to the list, trimming each file as appropriate. You can only add QuickTime movies that conform to the requirements of the Print to Tape document, and all clips must have the same essence. For details, see ([Using the Clip Panel \(page 129\)](#)).
6. **Play Out the Video as Print to Tape.** Click the Activate slider to start playing out your clips.



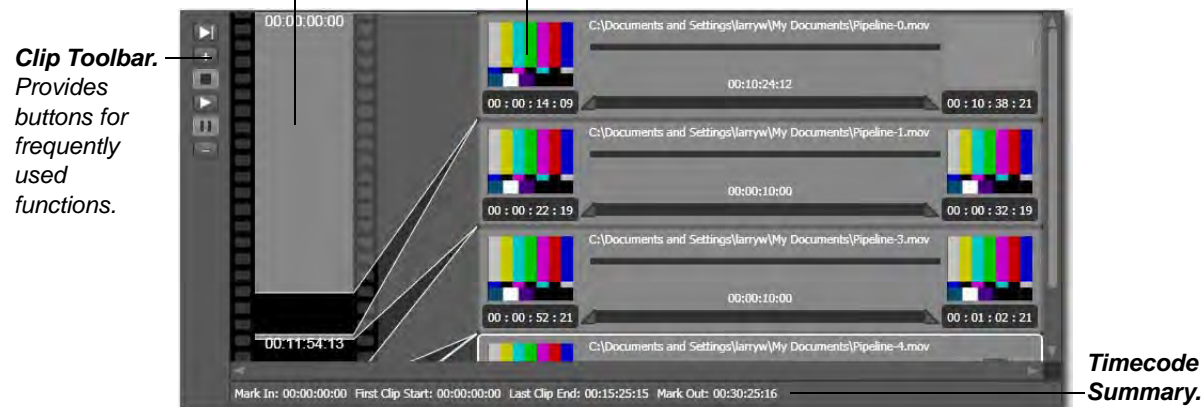
USING THE CLIP PANEL

The clip panel (on bottom, right side of the window) allows you to specify a set of clip files to play out in a print to tape operation, view a virtual tape track, and adjust trim points on each clip (clip markers).

Figure 10–4. The clip panel allows you to create a collection of clip files to print to tape.

Tape Stripe. Visual track for each leader, clip, and padding, by timecode.

Clips. Drag QuickTime mov files or click + to add them to the list. Click and drag to rearrange.



At the bottom of the clip list is the document's time code summary. The timecode summary includes Mark In – (start of leader or first clip), First Clip Start, Last Clip End, and Mark Out. By convention, the terms Mark In and Mark Out are inclusive-exclusive. Thus, Mark Out is the time code of the first frame NOT recorded. Clip start and clip end times are inclusive-inclusive.

Adding, Organizing, and Deleting Clips

To add a clip, drag a QuickTime movie file (containing media essences supported by Pipeline) onto the clip space. You can only drag one clip file at a time using this method. Or, click + (Plus icon) in the toolbar to display a File System dialog. Navigate and select files to add to the clip list.

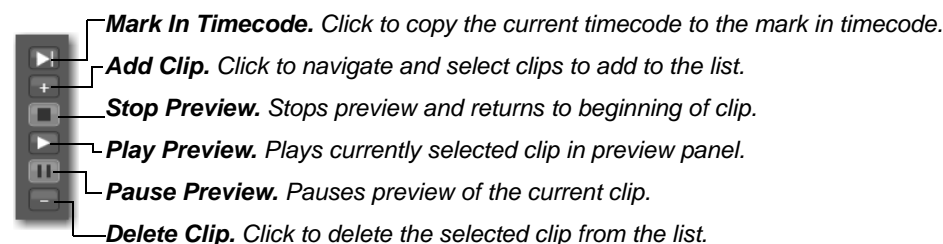
To delete a clip, select it in the clip list and press Delete or click the - (Minus icon) in the toolbar.

To rearrange clips, click and drag them to the position you want them in.

Clip Panel Toolbar

At the far left is a toolbar with buttons for frequently used functions.

Figure 10–5. The Clip Panel toolbar displays icons for frequently used commands.

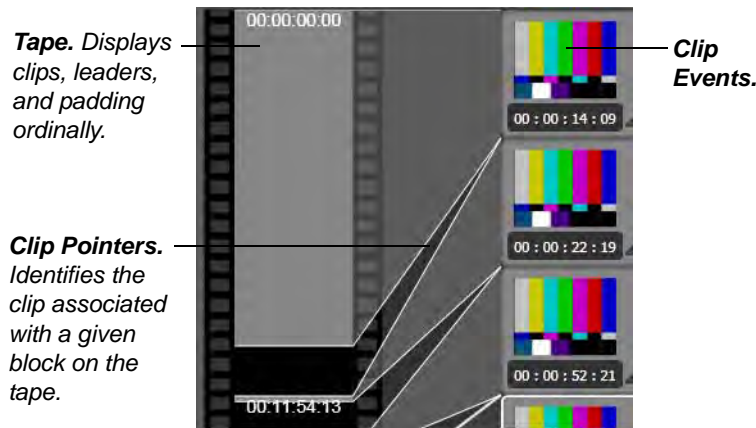


Print Time Tape

To the right of the toolbar is the Print Time Tape. The Print Time Tape is a virtual representation of the order and time the leaders, padding, trailer, and clips will be applied to the tape.

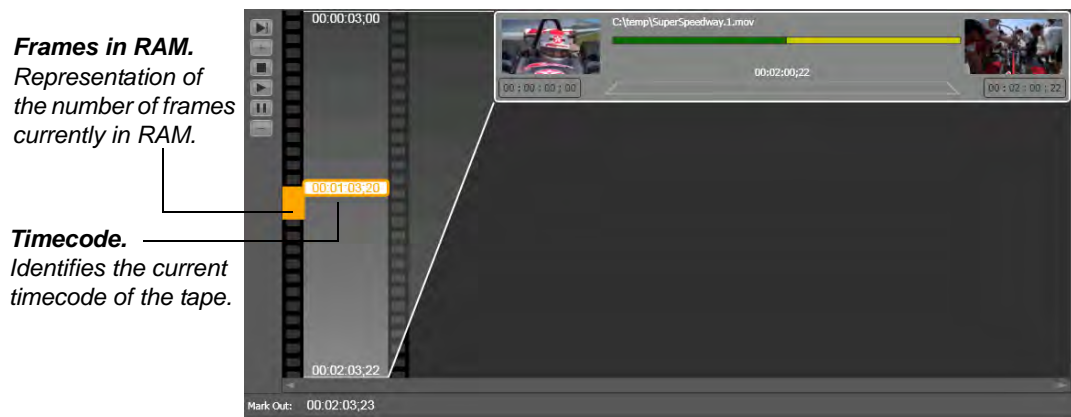


Figure 10–6. Print Time Tape details.



The print time tape helps you visualize how the clips will be printed, and includes leader, trailer and padding so that you can visualize and confirm the result of the print to tape operation before you actually perform it.

Figure 10–7. Print Time tape during playback.

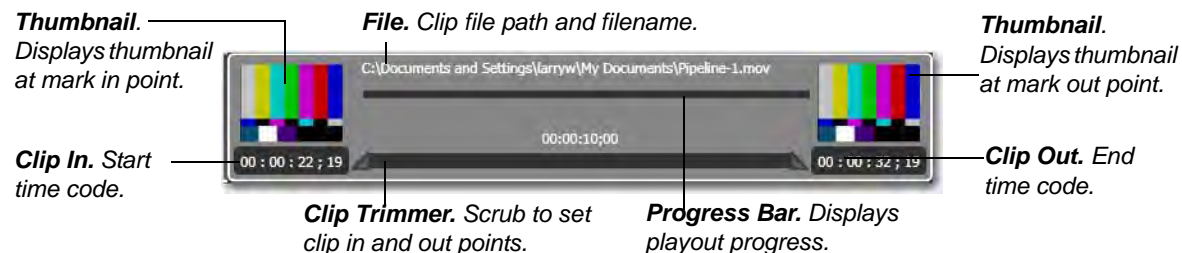


During a print to tape operation, the current timecode of the tape displays, along with a bar indicating the relative number of frames held in RAM. Additionally, the clip being printed displays a progress bar.

Clip Events

Each clip file you add to the clip list is identified by a clip event.

Figure 10–8. Clip events in your schedule provide details about the clip.



Each clip event has several controls:



Preview Thumbnails. Assigned when you created the mark-in and mark out points.

File Path. Displays the full path and file name of the clip for this clip event.

Duration. Specifies the duration of playout, as calculated by the clip in and clip out points.

Clip In & Clip Out. Set by using the scrubber controls to adjust clip in and clip out points.

Trimmer. Use the scrubber controls at the left and right to set your clip in and clip out points.

Progress Bar. When a file is playing out, displays relative progress and amount of media frames currently held in RAM.





APPENDIX A

Troubleshooting

This appendix provides instructions for gathering information to assist in troubleshooting. For a complete and current list of potential issues and recommendations, go to http://www.telestream.net/pdfs/user-guides/Pipeline_FAQ.pdf.

This information may be useful to Telestream Customer Service when you're obtaining support ([Obtaining Pipeline Support | Information | Assistance \(page i\)](#)).

GATHERING INFORMATION FOR TROUBLESHOOTING

These topics enable you to gather various details that aid in troubleshooting, depending on your workflow and environment.

- [Workflow Information](#) (immediately following)
- [Pipeline Device Firmware Information \(page 161\)](#)
- [Pipeline Direct Counters Panel Details \(page 161\)](#)
- [Obtaining Debug Logs from Pipeline Control \(page 161\)](#)

Workflow Information

First, briefly document the workflow and obtain system information about your source or destination system: FlipFactory (immediately following), Episode Engine ([Page 160](#)), Pipeline Control for Mac OS X ([Page 160](#)), Pipeline Control for Windows ([Page 160](#)), or Final Cut Pro ([Page 161](#)).

FlipFactory

Obtain FlipFactory information using FlipFactory's automatic support email or obtain it manually.

To obtain the information automatically, send email to Telestream by using the Email Tech Support button on the FlipFactory System Settings window (see the FlipFactory User's Guide, Chapter 5, Using FlipFactory, in the Sending Email to Tech Support section).

To obtain this information manually:

- Get FlipFactory version and all update packs which are installed
- Get a copy of the FlipFactory license file
- Get account and factory details – obtain an XML output of the account when possible
- Obtain the FlipFactory server and/or Pipeline client system information:



1. Click Start > Help and Support.
2. On the Help and Support panel, click Support from the top menu.
3. Click Advanced System Information.
4. Click View detailed system information.
5. On the System Information dialog, select File > Save to save an nfo file containing your system information to the desktop of the computer.

Episode Engine

Obtain the Episode Engine version and export your compression template to a file.

Obtain the Mac OS X system profile:

1. Launch the System Profiler, which is located at: /Applications/Utilities/System Profiler.
2. Select Save As... from the File menu.
3. Select Rich Text Format (RTF) from the Format popup menu.
4. Save the file to the desktop.

Pipeline Control for Mac OS X

Obtain the Pipeline Control for Mac OS X version and the Pipeline device firmware version ([Pipeline Device Firmware Information \(page 161\)](#)).

Obtain the Mac OS X system profile:

1. Launch the System Profiler, which is located at: /Applications/Utilities/System Profiler.
2. Select Save As... from the File menu.
3. Select Rich Text Format (RTF) from the Format popup menu.
4. Save the file to the desktop.

Save the Pipeline document(s) containing all of your settings, and send the system profile document and all Pipeline documents to Telestream support with other debug information.

If you are using a FlipFactory or Episode Engine publisher, obtain all of the system information associated with these systems ([FlipFactory \(page 159\)](#) and [Episode Engine \(page 160\)](#)).

Pipeline Control for Windows

Obtain the Pipeline Control for Windows version and the Pipeline device firmware version ([Pipeline Device Firmware Information \(page 161\)](#)).

Obtain the Windows system information profile:

1. Run the System Information tool: Start > All Programs > Accessories > System Tools > System Information.
2. Select Export from the File menu.
3. Save the System Information file to the desktop.

Save the Pipeline Scheduled Capture document(s) containing your settings and send the system profile document and Pipeline documents to Telestream support with other debug information.

If you are using a FlipFactory publisher, obtain all of the system information associated with these systems ([FlipFactory \(page 159\)](#)).



Final Cut Pro

Obtain the Final Cut Pro version and Pipeline plug-in revision.

Obtain the Mac OS X system profile:

1. Launch the System Profiler, which is located at: /Applications/Utilities/System Profiler
2. Select Save As... from the File menu.
3. Select Rich Text Format (RTF) from the Format popup menu.
4. Save the file to the desktop.

Pipeline Device Firmware Information

Obtain the Pipeline's firmware revision number. Locate the Main and App Loader revision numbers on the Configure panel of Pipeline Direct ([Using the Configure Panel \(page 44\)](#)).

Obtain the encoding specifications. Determine which Pipeline codec is being used (DV, DVCPPro, IMX30/40/50, MPEG-2). You can obtain this information in the Live panel ([Using the Live Panel \(page 53\)](#)).

Obtain Network Details

Pipeline IP address – default, static or DHCP.

Document whether the connection is direct or through a switch.

If the connection is through a switch, is the route through more than one?

Are there any managed switches between the Pipeline and the target system?

What is the speed of each leg of the connection: 100Mb or 1000Mb (Gigabit).

Document whether the LAN is used for general data traffic and video traffic or only video traffic.

Pipeline Direct Counters Panel Details

If a video or audio issue is being reported, repeat the encode or playout process while running Pipeline Direct and viewing the counters on the Counters panel (see [Using the Counters Panel \(page 51\)](#) for a description of these parameters). To display the Counters panel, click counters in Pipeline Direct's menu.

Obtaining Debug Logs from Pipeline Control

Debugging Pipeline components (hardware, client applications, etc.) can rarely be done independently. Since they all work as a system, they must be debugged as a system. The information obtained through these techniques can point to a problem anywhere in the system, and even to problems in multiple points in the system.

Mac OS X

Debug logs for Pipeline Control are generated only when you enable them, by editing property list files:



- Net.telestream.system.plist
- Net.telestream.PipelineControl.plist
- Net.telestream.tifo.plist
- Net.telestream.dvcprohd.plist
- Net.telestream.imx.plist

Each of these files controls, among other things, the output of debug information for different subsystems. The system plist handles enabling and disabling debug logging for the Pipeline Engine, the lowest layer of the Pipeline software suite. The second plist, *PipelineControl*, handles application level logging – the Pipeline Control application itself. The media format plists (tifo, devprohd, and imx, for example), handle debug logging for various QuickTime decompressor components.

To enable debug logging, first exit Pipeline Control. If you want to obtain debug logging for QuickTime decompressors, then you'll need to also exit QuickTime-enabled applications including QuickTime Player or Final Cut Pro.

Now, add a *DebugLevel* key to the plist as a number (for example, *NSNumber*), and a value 5. Save the changes to the plist and start PipelineControl again. Optionally, you can add a *DebugLog* key as a string (for example, *NSString*) to the plist, with a complete absolute path to a target text file. This causes debug logging to be output to the target text file instead of to the default location, which is viewable by the Console application.

To view the logs, you can open the Console application (Console. app is located in Applications/Utilities) and select the log from the panel on the left. This panel may need to be opened first – click the Show Log List icon in the upper left. After selecting the desired log file in the list, select File > Save As to save a copy to send to Customer Service.

Windows

Pipeline Control for Windows saves details in trace (...trace.log) files, located at <%INSTALL-DRIVE>\Program Files\Telestream\Pipeline Control. When requested, E-mail the latest log file, along with other details, to Customer Service.



APPENDIX B

Pipeline EDL Syntax

This appendix provides information about the proper syntax for the content of Pipeline EDL documents.

PIPELINE EDL SYNTAX REQUIREMENTS

Pipeline EDL files contain an entry for each clip to be captured. Each entry consists of a single-line event, a clip name field, and optional Telestream specific metadata fields. Columns are significant.



Note

Line endings for a Pipeline EDL file must be CRLF (Carriage Return followed by Line Feed), which is the DOS/Windows standard. Therefore, if you create an EDL file from scratch on a Macintosh, you may have to convert the line endings.

Event Line Fields

Pipeline EDL files contain an entry for each clip to be captured. Each entry consisting of a single-line event, a clip name field and optional Telestream specific metadata fields.

Event Line Form

```
1111 222222 333333 4444 555 666666666666 777777777777 888888888888 999999999999
```

Event Parameters

1111 = Column 1, 4-digit event number 0001 to 9999

222222 = Column 6, six character alphanumeric tape name (can be overridden by optional TAPENAME)

333333 = Column 13, six characters, leading with an A (audio) or V (video)

4444 = Column 20, must always be "C " (C followed by three spaces)

555 = Column 25, Must always be " ", three spaces

666666666666 = Column 29, SMPTE timecode of source Mark-In (hh:mm:ss:ff)

777777777777 = Column 41, SMPTE timecode of source Mark-Out

888888888888 = Column 53, not used



99999999999 = Column 65, not used

Note: Each parameter (1 through 9) must be separated by a single space.

Example: 0001 Reel01 A12V C 00:00:38;22 00:00:41;14 00:00:38;22 00:00:41;14

Clip Name Field (optional)

*CLIP: <Name_of_the_clip>

This name will be used by FlipFactory as the file name.

Begin Additional Fields Parameter

Telestream metadata fields (optional):

*TELESTREAM_METADATA: BEGIN

If optional TELESTREAM fields are included, the BEGIN parameter is required to be first.

Pipeline

This parameter determines which Pipeline to connect to for this clip entry. The name used for this field is the Bonjour friendly name assigned to the Pipeline device. This name defaults to Pipeline_XXXX where XXXX is the Pipeline's serial number.

The friendly name can be obtained by issuing the config CGI GET command to the Pipeline. The friendly name is contained within the Identity element of the returned XML descriptor. Config command example: <http://<Pipeline IP Address>/command.cgi?config>.

*TELESTREAM_METADATA: PIPELINE <Pipeline service name>

Example: *TELESTREAM_METADATA: PIPELINE Pipeline_3005

Pre-roll Value to VTR

*TELESTREAM_METADATA: PREROLL <Numeric value in seconds>

Example: *TELESTREAM_METADATA: PREROLL 2

Offset for Frame Accuracy

*TELESTREAM_METADATA: OFFSET <Numeric value in frames>

Example: *TELESTREAM_METADATA: OFFSET 0

Anamorphic Flag

Produced when video is specified as 16 x 9 format because the 16 x 9 check box has been selected on the live page for proper video display. Any EDL produced with this option checked will also set the ANAMORPHIC flag to TRUE:

*TELESTREAM_METADATA: ANAMORPHIC TRUE

This flag insures that anamorphic flags are set in appropriate output files in FlipFactory.

Abort Switch for Dropped Frames

A *true* value will abort the process if a frame is dropped, *false* will continue even if a frame is dropped



*TELESTREAM_METADATA: ABORT <true/false>

Example: *TELESTREAM_METADATA: ABORT false

Name of Tape

*TELESTREAM_METADATA: TAPENAME <Alphanumeric>

Example: *TELESTREAM_METADATA: TAPENAME TAPE1234

Description of Clip

*TELESTREAM_METADATA: DESCRIPTION <Alphanumeric>

Example: *TELESTREAM_METADATA: DESCRIPTION This is a test

Scene Number or Name

*TELESTREAM_METADATA: SCENE <Alphanumeric>

Example: *TELESTREAM_METADATA: SCENE Good cop bad cop

Take Number

*TELESTREAM_METADATA: TAKE <Numeric>

Example: *TELESTREAM_METADATA: TAKE 2

Additional Notes

*TELESTREAM_METADATA: NOTES <Alphanumeric>

Example: *TELESTREAM_METADATA: NOTES Additional information goes here.

End of Additional Fields Parameter

*TELESTREAM_METADATA: END

If optional TELESTREAM fields are included this parameter is require to be last.





APPENDIX C

Pipeline Control Codec Profiles

This appendix describes each Pipeline codec's preset profiles. SD profiles are available in Pipeline SC and Pipeline Quad. Both SD and HD codec profiles are available in Pipeline HD Dual.

Some wrapper/file formats do not support all possible audio / video options. For example, MXF wrappers (Avid, XDCam, and Op1a) do not support 16 channels of audio.

Video Profiles

- [DNxHD Profiles \(page 168\)](#)
- [DV and DVCPro Profiles \(page 168\)](#)
- [DVCPro HD Profiles \(page 168\)](#)
- [IMX Profiles \(page 169\)](#)
- [ProRes Profiles \(page 169\)](#)
- [SD Uncompressed Profiles \(page 170\)](#)

Audio Profiles

- [Linear PCM Profiles \(page 170\)](#)



DNxHD Profiles

Table A–1. DNxHD Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality
720p	1280	16:9	23.976, 25, 29.97, 50, 59.94	8bit SQ, 8bit HQ, 10bit HQ
1080i*	1440	16:9	25, 29.97	8bit SQ
1080i*	1920	16:9	25, 29.97	8bit SQ, 8bit HQ, 10bit HQ
1080p	1920	16:9	23.976, 24, 25	8bit LQ
1080p	1920	16:9	23.976, 24, 25, 29.97	8bit SQ, 8bit HQ, 10bit HQ

*1080i Field Order: Upper Field First

DV and DVCPro Profiles

Table A–2. DV and DVCPro Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
480i*	720	4:3, 16:9	29.97	25
576i**	720	4:3, 16:9	25	25

*NTSC Field Order: Lower Field First

**PAL Field Order: Upper Field First

DVCPro HD Profiles

Table A–3. DVCPro HD Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
720p	960	16:9	23.976, 25, 29.97, 50, 59.94	100
1080p	1280	16:9	23.976	100
1080i*, 1080p	1280	16:9	29.97	100
1080i*, 1080p	1440	16:9	25	100

*1080i Field Order: Upper Field First



IMX Profiles

Table A–4. IMX Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
486i*	720	4:3, 16:9	29.97	30, 40, 50
576i**	720	4:3, 16:9	25	30, 40, 50

*NTSC Field Order: Lower Field First

**PAL Field Order: Upper Field First

ProRes Profiles

ProRes SQ is supported in SD profiles; SQ and HQ are supported in HD profiles.

Table A–5. ProRes Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
486i*	720	4:3, 16:9	29.97	SQ, HQ
576i**	720	4:3, 16:9	25	SQ, HQ
720p	960, 1280	16:9	23.976, 25, 29.97, 50, 59.94	SQ, HQ
1080p	1440, 1920	16:9	23.976	SQ, HQ
1080i***, 1080p	1440, 1920	16:9	25, 29.97	SQ, HQ

*NTSC Field Order: Lower Field First

**PAL Field Order: Upper Field First

***1080i Field Order: Upper Field First

Motion JPEG Profiles

Motion JPEG A is supported in SD profiles; Standard and HQ are supported in HD profiles.

Table A–6. Motion JPEG Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
240p	320	4:3	25, 29.97	Q80
240p	427	16:9	25, 29.97	Q80



SD Uncompressed Profiles

Table A–7. SD Uncompressed Profiles

Vertical	Horizontal	Aspect Ratios	Frame Rates	Quality (Mbps)
480i*, 486i*	720	4:3, 16:9	29.97	8, 10 bit
576i**	720	4:3, 16:9	25	8, 10 bit

*NTSC Field Order: Lower Field First

**PAL Field Order: Upper Field First

Linear PCM Profiles

Table A–8. Linear PCM Profiles

Parameter	Value
Channels	2 4 8 16
Sample Rate	48 kHz
Quality	16 24 bit, Big Endian Little Endian



APPENDIX D

Pipeline Web Service Version 2.1 API

This chapter includes information about using Telestream's Pipeline Web Service Version 2.1 API to write applications that can programmatically control Pipeline Control to record media.

This version applies to Pipeline Control for Mac OS X Version 2.2 or later and Windows Version 2.0 or later. If you are using Pipeline Control for Mac OS X Version 2.0/2.1 or Pipeline Control for Windows Version 1.5.7, see [Pipeline Web Service Version 2.0 API \(page 173\)](#).

CONTROLLING PIPELINE CONTROL TO RECORD MEDIA

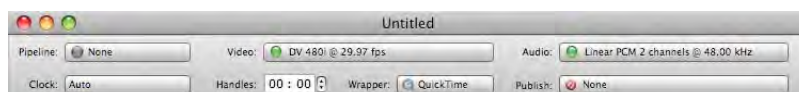
The Pipeline Web Service API provides the ability to remotely start and stop capture operations using the Pipeline Trigger engine.

The Trigger document publishes a Web service that allows media clips to be recorded using a simple HTTP based commands set.

- A clip can be scheduled for recording up to 6 hours before the start time.
- If a start time is not specified the clip begins recording immediately.
- If an end time is not specified the clip will record for the maximum duration of 9 hours.
- A clip will remain in the active list up to 4 hours after recording has ended.

The Trigger document enables recording to be controlled manually through the user interface or through simple HTTP web service commands described below. The Trigger document provides controls which allow the user to select a Pipeline and specify the video format, number of audio channels, media file format, etc.

Figure D–1. Pipeline settings panel



The Trigger document window also displays a control that allows the user to enable or disable automatic recording via Web service, and to enter a TCP/IP port number to identify this document, so that you can perform automatic recording on multiple active Trigger documents.

Figure D–2. Enabling automatic recording and specifying the document by port number.



When the Web service is enabled and the Trigger document is placed into an active state (by clicking the Activate button at the bottom), the Web service begins listening for requests on the specified port. The user is warned if the port is in use by another Trigger document or by another service on the host computer.

Enter `http://<IP address>:<port>` in a browser to display instructions and parameters for Pipeline Control Web service functionality. If the browser is on the same computer that Pipeline Control is running on and the port is set to default the URL is `http://localhost:8080`.

The Web Service must be checked in a Trigger document and the document must be activated so that the page can load.



INVOKING THE PIPELINE CONTROL WEB SERVICE

The Pipeline Control Web service is invoked by issuing an HTTP GET request to the Pipeline host computer (for example, via a Web browser) where Pipeline Control is currently running:

`http://<address>:<port><command>[?<argument>=value[?<argument>=value]`

Where...

<address>: The DNS name or IP address of the computer running the Pipeline software, for example "localhost" or 192.168.1.2.

<port>: The user-assigned TCP/IP port assigned to the Web Service for the current Pipeline document (each active document must have a unique port number). The port number is user selectable and displayed in the Web Service configuration area of the document.

<command>: A specific Web Service command, as listed in [Commands \(page 175\)](#).

If the command requires arguments, they are supplied as name/value pairs in the query portion of the request, in the form `<argument>=value`.

The HTTP response status is a single line, which indicates the success or failure of the request, and additional information in the form of HTTP response headers.

For example:

200 Recording started at 01:01:04:24

404 Not implemented

The following headers may appear in a web service response:

Time: 12:34:56:00 The current Pipeline timecode.

UUID: {5b1eb65c-3018-a4cf-8134-6e1c16b378a7} The unique identifier assigned to a clip.

Start: 01:23:45:00 The starting timecode of a clip.

End: 01:23:50:00 The ending timecode of a clip.

Path: /Users/Shared/Clip.mov The fully qualified path to the file containing a recorded clip.

State: Capturing The state of a recorded clip or the trigger engine.

See commands below for specific return data.

You can issue the commands manually, via a Web browser window, or you can write a custom application to implement automatic live recording via a remote application.



Note

Web browsers, by default, do not display the result codes from HTTP GET requests. Additional software is usually necessary to view the result in a Web browser.

For Firefox users, HeaderSpy may be a helpful extension.

Issuing Commands

Follow these steps to control Pipeline Control remotely:



1. Run Pipeline Control and/or open a Trigger document. Select a Pipeline device, set the appropriate codec, resolution and audio parameters, and set the format to QuickTime or TIFO or other file/wrapper format.
2. Check the Web Service check box to enable automatic live recording via a Web service, and enter the specified port value (between 1025 and 49151). The port number must be unique to the document. Make sure that this TCP port is open on the host system.
3. Save the changes to the document.
4. Click the Activate button to activate the document.
5. Send commands to the document using an HTTP GET (this can be performed directly via a Web browser or a custom application), using the host system's IP address and specified port.



COMMANDS

Use the following commands to control the open Trigger document and perform recording.

Command results are returned as an HTTP result code, which you must parse appropriately to utilize.

Help

Displays a help Web page describing the operation and features of the Pipeline Control Web Service.

Format. `http://address:port/`

or

`http://address:port/Help`

Start

This command begins recording a new file of the specified (or internally-generated) name, using the document's predefined codec, audio and format selections. The clip file is opened in the storage folder associated with the document.

Details. Recording begins on the video frame following a successful response to the client. The publishing plug-in associated with the document will receive a record start event when the clip file has been opened and initialized. Pipeline Control will continue recording the clip until a stop request is received or the maximum clip length is reached.

If you send a subsequent START command while Pipeline Control is currently recording, the command fails with a 401 Service is Busy response code.

Format. `http://address:port/record/start`

–OR–

`http://address:port/record/start?name=myclip`

Parameters (Optional)

start. Specifies the starting timecode for the clip in the form HH:MM:SS:FF. If a start time is not specified the clip will begin recording immediately.

Responds with '400 Bad Request' if the specified start time is more than 6 hours in the future.

duration. Specifies the duration of the clip in the form HH:MM:SS:FF. If a duration is not specified (or implied by the end time parameter) the clip will record for a maximum of 9 hours.

Responds with '400 Bad Request' if the specified duration is greater than 9 hours.

end. Specifies the end timecode for the clip in the form HH:MM:SS:FF. If an end time is not specified (or implied by the duration parameter) the clip will record for a maximum of 9 hours.

Responds with '400 Bad Request' if the specified end time results in a clip duration greater than 9 hours.

name. Specifies the name of the file to be recorded. Must be a legitimate file name for the host system, and should not contain a suffix. If no name is supplied, Pipeline Control generates a name for the file. If multiple files are created from the same root value, Pipeline Control over-writes the original file. It is incumbent on the user to make the file name unique.

Responds with '400 Bad Request' if the name contains invalid characters



If a name is specified and the file already exists it will be overwritten. If a name is not specified a unique file name will be generated (e.g. *Pipeline56*). The file extension is added by the document based on the predefined media format selected.

path. Specifies the path (for example, /Users/Share) to a folder where the clip should be recorded. If a folder path is not specified the clip will be recorded in the storage folder associated with the Trigger document. Responds with '400 Bad Request' if the folder does not exist.

Stop

This command stops recording the current clip and/or removes the clip from the active list. The clip file is closed and stored in the storage folder associated with the document.

Details. Recording ends on the video frame following a successful response to the client. The publishing plug-in associated with the document receives a record stop event when the clip file has been closed.

If the document is not currently recording, the command fails with a 408 Service is Idle response code.

Format. http://address:port/record/stop

Parameters (Optional)

uuid. The unique identifier (for example, 5b1e...78a7) of the clip to stop. If a clip is not specified, all clips are stopped and removed from the active list.

Responds with '404 Not Found' if the specified clip is not in the active list.

Status

This command causes Pipeline Control to issue a response based on its current state.

Format. http://address:port/record/status

Parameters (Optional)

uuid. The unique identifier (for example, 5b1e...78a7) of the clip to interrogate. If a clip is not specified, the response contains the UUID of all clips in the active list.

Responds with '404 Not Found' if the specified clip is not in the active list.



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