Matrox VS4

Installation and User Guide

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Digital Video Solutions

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Supported formats: DV/DVCAM, DVCPRO, DVCPRO50, DVCPRO HD, MPEG-2 I-frame SD, MPEG-2 I-frame HD (includes 720p, full-size 1080i/p, and 1440x1080i/p), MPEG-2 I-frame SD + Alpha, MPEG-2 I-frame HD + Alpha, Offline HD, HDV and EZ-HDV (playback only), Uncompressed 8-bit and 10-bit SD, Uncompressed 8-bit and 10-bit HD, Uncompressed 8-bit and 10-bit SD + Alpha, Uncompressed 8-bit and 10-bit HD + Alpha, EZ-MXF (playback only), and Motion-JPEG (playback only).

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1

Introducing Matrox VS4

This chapter lists the Matrox VS4 system requirements, and describes the VS4 documentation.

Welcome to Matrox VS4

Matrox VS4 is a quad HD-SDI card that lets you record up to four channels simultaneously using the VS4Recorder Pro stand-alone recording application, and when using Telestream Wirecast or StudioCoast vMix, you can create video streaming productions as well as record your source feeds.

Matrox VS4 lets you take advantage of professional broadcast video and audio sources. Using a single PCIe slot, Matrox VS4 provides up to four independent HD-SDI inputs with up to eight embedded audio channels per source. Since all inputs on Matrox VS4 are independent, you can use HD and SD sources in the same production. Full-sized BNC connectors connect directly to your sources.

You can record your input sources as *.avi* files, *.mov* files, or *.mp4* files, and then use your favorite editing application, such as Adobe Premiere Pro, to natively edit your material. You can use the following codecs for each file:

- For *.avi* files, you can use the MPEG-2 I-frame codec at up to 300 Mb/s (HD) or 50 Mb/s (SD).
- For *.mov* files, you can use a Matrox DV codec or the H.264 codec.
- For *.mp4* files, you can use the H.264 codec.

Up to two VS4 cards are supported per system. In a two-card system, all eight VS4 inputs are available for streaming in Telestream Wirecast, and recording is supported on the four inputs of the primary VS4 (see).

Matrox VS4 system requirements

Matrox For up-to-date information about your system requirements and Matrox-tested systems for this product, check the "System Recommendations" section of the Matrox of the Support website at www.matrox.com/video/support.

Supported programs

For a complete list of applications supported with (product name), see the "Supported OS and Applications" document provided in the "Downloads" section of the Matrox Support website at www.matrox.com/video/support.

Disabling fast startup

On a Windows 8.1 operating system, fast startup can be used as an alternative to a full shutdown of your system. On a system with Matrox VS4 installed, the fast startup alternative shutdown state can cause your system to become unstable and must be disabled.

To disable fast startup:

1 In **Control Panel**, choose **All Control Panel Items > Power Options**.

2 In the side panel, click **Choose what the power buttons do**.

3 Under **Shutdown settings**, clear the **Turn on fast startup (recommended)** box.

4 Click **Save changes**.

About this guide

This guide provides you with information about installing and using your Matrox VS4 hardware and software, including how to configure Matrox VS4 for use with supported programs.

Unless otherwise specified, references to the VS4 card in this guide apply to both VS4 and VS4 Pro cards.

Style conventions

The following style conventions are used in this guide:

- The names of files, folders, and documents appear in *italics*. For example:
  - The data is stored in the *Sample.avi* file.
  - The file is located in the *Clips* folder.
  - Please refer to your *Matrox VS4 Release Notes*.
- Menus and commands that you need to choose are displayed in the form **Menu > Command**. For example, **File > Save** means click **File** in the menu bar, and then click **Save** in the menu that appears.

How video formats are expressed

With the exception of NTSC and PAL, all SD and HD video formats are expressed in the Matrox VS4 documentation as follows:

VRp or **i** or **PsF** at **n fps**

Where:

- **VR** is the vertical resolution. For 1440×1080 video, however, both the horizontal and vertical resolutions are specified.
- **p** or **i** or **PsF** represents either progressive, interlaced, or progressive segmented frame video.
- **n fps** is the frame rate in frames per second.

Here are some examples:

- **480p** at **23.98 fps**   Represents 720×480 progressive video at 23.98 frames per second.
- **720p** at **59.94 fps**   Represents 1280×720 progressive video at 59.94 frames per second.

- **1440x1080i** at **29.97 fps**   Represents 1440×1080 interlaced video at 29.97 frames per second. This format is used for HDV 1080i material.
- **1080i** at **29.97 fps**   Represents full-size 1920×1080 interlaced video at 29.97 frames per second.

Last-minute information

- Any important information that was not available for inclusion in this guide by publication time is provided to you in the *Matrox VS4 Release Notes*.

2

Installing Matrox VS4 Hardware and Software

This chapter describes how to install your Matrox VS4 hardware and software.

Before installing your Matrox hardware

Read the following information carefully before attempting to install the Matrox VS4 card.

✏️ **Note**   Unless otherwise specified, references to the VS4 card in this guide apply to both VS4 and VS4 Pro cards.

Start with a functioning system

Before attempting any Matrox VS4 installation, you should have a computer with a supported Windows operating system fully installed and functioning properly. This will avoid potential problems later on.

Avoid costly damage

Static electricity from your body can damage your Matrox VS4 card or your computer. Although you may not notice it, static electricity is generated every time you move. It's often too small to cause a spark, but it can still cause damage to sensitive electronic components or at least reduce their lifespan.

To avoid damage, please observe the following precautions:

- Do not remove your Matrox VS4 card from its anti-static bag until you're ready to install it. Before removing the card, place the package within easy reach of the area where you intend to perform the installation.

- You should avoid touching the chips and other components on the circuit board. Try to handle the card by its edges.

- Try to work in an area where the relative humidity is at least 50%.

- Do not wear wool or synthetic clothing. These fabrics tend to generate more static electricity than cotton, which is best for this kind of work.

- Turn off the power switches on your computer and its connected components.

Once you've opened your computer, drain static electricity from your body by touching a bare metal surface on your computer chassis before you install or remove any parts of your system. If you have a grounding wrist strap, use it while handling and installing any components in your computer.

Installing your Matrox VS4 card

The Matrox VS4 card is a three-quarter length PCIe card designed to operate in your computer's x8 or greater PCIe slot (x8 electrical is recommended for optimal performance). You can install up to two VS4 cards in the same system.

For detailed instructions on how to perform the following steps, refer to your computer's documentation.

1 Shut down the computer, unplug the power cord and all the cables from the unit, and open the computer's chassis.

2 Insert the Matrox VS4 card in an available PCIe x8 (electrical) slot in the computer, and secure the card into place.

⚠ **Caution** To avoid overheating issues, don't install the Matrox VS4 card close to another card that generates heat, such as a display card.

3 Close the computer chassis, and reconnect the power cord and all the cables to the unit.

Installing Matrox VS4 software

Matrox Mtx.utils Setup installs the VS4 device drivers and VS4 software. If you plan on using VS4 with a Matrox Convert DVI product, Matrox Mtx.utils Setup gives you the option of installing the Convert DVI software as well. If you want to use StudioCoast vMix with VS4, you must choose to install the Matrox A/V DirectShow Filters. For more information on using VS4 with StudioCoast vMix, see Chapter 6, "Using Matrox VS4 with StudioCoast vMix," on page 79.

Before installing Matrox Mtx.utils, make sure that all supported third-party applications that you want to use with VS4, such as Telestream Wirecast, are installed. You can install Matrox Mtx.utils on a computer with or without the Matrox VS4 card installed.

To download and install the latest version of Matrox Mtx.utils, visit the Support section of our website at www.matrox.com/video/support. You can also contact your Matrox representative for the latest software.

Updating your VS4 firmware

When you install Mtx.utils while your VS4 card is installed in your computer, the Mtx.utils Setup program automatically verifies the firmware on your VS4 card and updates it if required. If you install Mtx.utils on a computer without the VS4 card, the next time you start your computer with your VS4 card installed, Mtx.utils Setup will update your VS4 firmware if needed.

⚠ **Caution** Do not power off your computer, or interrupt the firmware update during the update process. Doing so may damage your VS4 card.

Important note about sleep and hibernation modes

Your system's sleep and hibernation modes are not supported by the Matrox Mtx.utils software. To avoid stability issues, disable sleep and hibernation modes on your system after installing Matrox Mtx.utils.

Removing your Matrox VS4 software

Perform the following steps to remove the VS4 software from your computer. When uninstalling the VS4 software, your current VS4 settings are kept for future VS4 software installations.

1 Choose **Start > All Programs > Matrox Mtx.utils > Uninstall Matrox Mtx.utils**.

2 Click **Next**.

3

Connecting External Devices to Matrox VS4

This chapters shows how to connect external devices to Matrox VS4.

Available Matrox VS4 connections

The Matrox VS4 card offers four SDI inputs. Each input supports HD/SD video and up to eight channels of embedded audio.

Note References to the VS4 card apply to both VS4 and VS4 Pro cards.

You can install up to two Matrox VS4 cards in the same system (see "Selecting your primary VS4 card" on page 93). In a two-card system, VS4 input availability is as follows:

- **VS4Recorder Pro** When using VS4 with the VS4Recorder Pro application, recording is supported on the four inputs of the VS4 card selected as the primary.
- **Telestream Wirecast** When using VS4 with Telestream Wirecast, all eight VS4 inputs can be used as input devices to feed live video and audio to Telestream Wirecast for streaming. ISO recording is supported on the four inputs of the primary VS4.
- **StudioCoast vMix** When using VS4 with StudioCoast vMix, the four inputs of the primary VS4 can be used as input devices to feed live video and audio to StudioCoast vMix for streaming and ISO recording.

Supported input formats

This section lists the video formats that are supported on the Matrox VS4 inputs. When connecting sources with different video formats, the sources must have compatible frame rates. For example, 1080i at 29.97 fps and 720p at 59.94 fps, or 1080i at 25 fps and 720p at 50 fps. The table below shows the supported video input formats grouped by compatible frame rates.

- 720×480 at 29.97 fps (NTSC) 4:3
- 720×480 at 29.97 fps (NTSC) 16:9
- 720p at 59.94 fps
- 1080i at 29.97 fps
- 1080PsF at 23.98 fps
- 1080PsF at 29.97 fps
- 1080p at 23.98 fps
- 1080p at 29.97 fps

- 720×576 at 25 fps (PAL) 4:3
- 720×576 at 25 fps (PAL) 16:9
- 720p at 50 fps
- 1080i at 25 fps
- 1080PsF at 25 fps
- 1080p at 25 fps

- 1080PsF at 24 fps
- 1080p at 24 fps
- 1080p at 30 fps

Note If using VS4 with Telestream Wirecast for streaming, you can use the scaling options available in Wirecast to scale the VS4 video input. Matrox VS4 does not support video input scaling for recording.

Connecting devices to Matrox VS4

A Matrox VS4 card provides SDI input connectors for up to four external video devices.

Connect an SDI video cable (not provided) from your SDI source device to an available SDI input (**1**, **2**, **3**, or **4**) on the Matrox VS4 card.

(i) **Important**   If connecting sources with different video formats, the sources must have compatible frame rates. For a list of compatible frame rates, see "Supported input formats" on page 10.

VS4 card
(optional second card)

VS4 card

SDI video cables
(not provided)
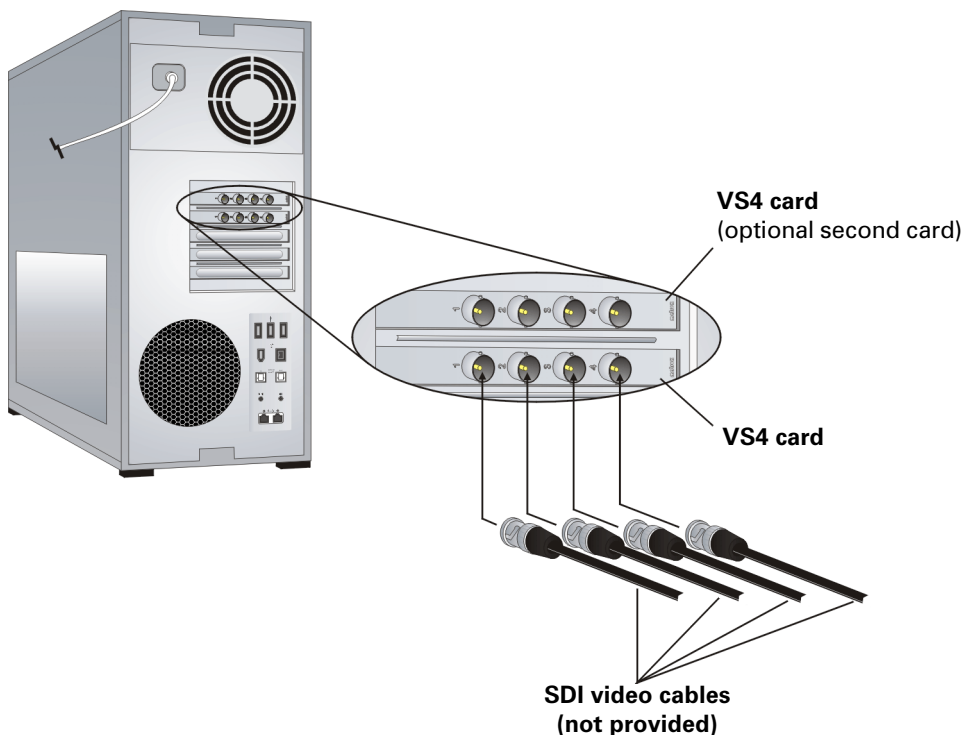
Your notes

4

Using the VS4Recorder Pro Application

This chapter describes how to use the VS4Recorder Pro application to record your VS4 video input sources.

Overview

VS4Recorder Pro is a versatile stand-alone application that lets you frame accurately record four live audio/video feeds using a VS4 card. It's ideal for multi-camera productions, providing HD/SD recordings that can be easily repurposed and archived, while simultaneously offering a complete multi-viewer experience. VS4Recorder Pro offers two record modes and a multiple-VS4 networking workflow to suit your needs:

- **Multi-Cam mode** provides synchronized frame accurate captures. Using VS4Recorder Pro in Multi-Cam mode allows you to record multiple angles of a single event, easily started and stopped using a single record button.

- **Independent mode** is for quickly recording content for the archiving or repurposing of video assets. Independent mode lets you monitor and control the recording of up to four sources independently using dedicated record buttons.

- **VS4Control** is for synchronized, frame-accurate recordings of an unlimited number of video sources connected to multiple, networked VS4 machines, organized in a master-slave configuration.

(i) **Important**   For all recording sessions, Input 1 must be connected to a valid source.

Starting VS4Recorder Pro

To start the VS4Recorder Pro application, choose **Start > All Programs > Matrox Mtx.utils > VS4Recorder Pro**.

VS4Recorder Pro interface

View bar (page 16)

Source window (x4)
(page 19)

Control bar
(page 16)

View bar

Minimize button		Hides the VS4Recorder Pro interface while keeping the application running and accessible.
Maximize/Restore button		Expands the VS4Recorder Pro interface to the maximum size allowable within the display area of the monitor while maintaining the interface aspect ratio. This option is not available when in full-screen mode.
		When the VS4Recorder Pro interface is maximized, this button restores the VS4Recorder Pro interface to its previous size.
Full-Screen button		Initiates full-screen mode whereby the VS4Recorder Pro source windows occupy the entire display area of the monitor. In this mode, the View bar and Control bar areas of the interface are visible only when mouse activity occurs. You can, however, choose to lock the Control bar so that it always remains on screen. For more information, see "Full-screen mode" on page 56.
		Exits full-screen mode and restores the VS4Recorder Pro interface to its previous size.
Close button		Closes the VS4Recorder Pro application. You cannot close the application during a recording session.
Machine identification and designation	Computer 1 - Master	(VS4Control only) Indicates the computer name and its designation (Master or Slave) when using VS4Control.

Control bar

Record Mode button		Indicates that VS4Recorder Pro is set to Multi-Cam mode. For more information, see "Multi-Cam mode" on page 25.
		Indicates that VS4Recorder Pro is set to Independent mode. For more information, see "Independent mode" on page 25.
Session Record button and timer (Multi-Cam mode)		In Multi-Cam mode and on the Master machine when using VS4Control, the Session Record button starts/stops the recording session for all selected sources (see "Source window" on page 19). The timer shows the current session timecode for all source recordings. For more information, see "Recording sessions and timecodes" on page 26.
		In Independent mode, the Session Record button and timer are disabled. In this mode, each source recording has its own session timer, and is started/stopped using dedicated Record buttons. For more information, see "Source window popover" on page 20.
Dropped-Frame indicator (Multi-Cam mode)		In Multi-Cam mode and when using VS4Control, the Dropped-Frame indicator appears if dropped/skipped frames occur in any of the source recordings during a recording session. For more information, see "Record status" on page 26.
		In Independent mode, the Dropped-Frame indicator appears in the source window popover for the affected source recording only (see "Source window popover" on page 20).

VS4Recorder Pro interface

Record Path button (Multi-Cam mode)		In Multi-Cam mode and when using VS4Control, the Record Path button appears once a recording session is stopped. Click this button to open Windows Explorer at the specified record path to view the recorded files and record log file. If dropped/skipped frames occurred in any source recording during the recording session, the Dropped-Frame icon appears within the Record Path button. For more information, see "Record Path button" on page 28.
		In Independent mode, a separate Record Path button appears in the source window popover for each source recording (see "Source window popover" on page 20).
Settings button		Opens and closes the VS4Recorder Pro **Settings** window (see "Settings" on page 31).

Source window

Source window popover
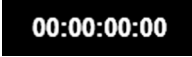
			Indicates the status of the current source recording. For more information, see "Record status" on page 26.
Record Status LED	🔴	🟡	Indicates the status of the current source recording. For more information, see "Record status" on page 26.
	🟢	🔵	
Label and filename overlay	**Label / Filename**		Displays the label and filename of the source recording as specified in the VS4Recorder Pro settings (see "Label and filename overlay" on page 57).
VU meter			Used to monitor the audio levels of up to eight audio channels. For more information on VU meter functionality, and to enable and customize the VU meters, see "VU meters" on page 50.

VS4Recorder Pro interface

Source window popover

In the **Settings** dialog, you can lock the source window popovers so they stay open. For more information, see "" on page 57.

Source Selection button (Multi-Cam mode only)		The source is enabled for recording. Starting a recording session using the Session Record button (see "Control bar" on page 17) starts the recording for all enabled sources. If a recording session is currently in progress, enabling the source starts the recording for that source. An input is automatically enabled for recording when a source is connected, and when starting the VS4Recorder Pro application with the source already connected.
		The source is disabled, and will not begin recording when a recording session is started using the Session Record button (see "Control bar" on page 17). If a recording session is currently in progress, disabling the source stops the recording for that source.
		Indicates that a video source is not connected to the VS4 input, or the connected video input source is invalid. The source cannot be recorded in this state.
Source recording button (Multi-Cam mode only)		Indicates that a quadrant is recording. Click this button to stop a source from recording. In order for that source to start recording again, it must be re-enabled (see "How to record" on page 22),
Record button (Independent mode only)		In Independent mode, the Record button starts/stops the recording session for that source only. For more information, see "Recording sessions and timecodes" on page 26.
		In Multi-Cam mode and on the Master machine when using VS4Control, the recording session for all selected sources is started/stopped using the Session Record button on the Control bar (see "Control bar" on page 17).

Audio Monitoring button		Source audio monitoring is currently enabled for the selected audio pair. For more information see "Audio monitoring" on page 54.
		Source audio monitoring is currently disabled. For more information see "Audio monitoring" on page 54.
Source record timer	00:00:00:00	In Multi-Cam mode and when using VS4Control, the timer represents the duration of the current source recording only. The overall recording session timer is displayed on the Control bar. For more information, see "Recording sessions and timecodes" on page 26.
		In Independent mode, the timer represents the duration of the current source recording and recording session. For more information, see "Recording sessions and timecodes" on page 26.
Dropped-Frame indicator (Independent mode)		In Independent mode, the Dropped-Frame indicator appears if dropped/skipped frames occur during the source recording. For more information, see "Record status" on page 26.
		In Multi-Cam mode and when using VS4Control, the Dropped-Frame indicator appears on the Control bar (see "Control bar" on page 17).
Record Path button (Independent mode)		In Independent mode, the Record Path button appears once a recording session is stopped. Click this button to open Windows Explorer at the specified record path to view the recorded files and record log file. If dropped/skipped frames occurred during the source recording, the Dropped-Frame indicator appears within the Record Path button. For more information, see "Record status" on page 26.
		In Multi-Cam mode and when using VS4Control, the Record Path button appears on the Control bar (see "Control bar" on page 17).

VS4Recorder Pro interface

Disk space indicator	39 m	Provides a visual representation of the available disk space on the source's specified record path disk, and displays the approximate remaining record time before the disk is full. For more information, see "Disk space indicator" on page 26.
Source View button		When in quad-view mode, this button switches VS4Recorder Pro to single-view mode with the corresponding source expanded to fill the entire VS4Recorder Pro source window area (see "Source view" on page 55).
		When in single-view mode, this button switches VS4Recorder Pro to quad-view mode with all four sources visible in the VS4Recorder Pro source window area (see "Source view" on page 55).

How to record

Frame accurately record live feeds using HD and SD codecs with VS4Recorder Pro.

(i) **Important** For all recording sessions, Input 1 must be connected to a valid source.

VS4Recorder Pro provides industry-recognized video codecs for recording your HD and SD sources:

- Create *.mov* files for SD sources using the DV/DVCAM, DVCPRO, and DVCPRO50 codecs.
- Create *.mov* files for SD and HD sources using the H.264 codec.
- Create *.mov* files for HD sources using the DVCPRO HD codec.
- Create *.mp4* files for SD and HD sources using the H.264 codec.
- Create *.avi* files using the MPEG-2 I-frame codec at up to 300 Mb/s (HD) and 50 Mb/s (SD).

If you choose to include audio in your recording, the first two channels from your input source are automatically embedded as PCM or AAC audio in the video file, and up to eight channels of AAC (*.aac*) or PCM (*.wav*) audio are recorded as separate audio files. You can then use the recorded video and audio files in an editing application, such as Adobe Premiere Pro, for post-event editing (see "Working with editing applications" on page 60).

Tip You can set a recording capture duration limit in the VS4Recorder Pro settings (see "Capture duration" on page 37).

1 Connect up to four sources to the SDI inputs on the VS4 card (see Chapter 3, "Connecting External Devices to Matrox VS4"). Make sure to always connect a source to Input 1.

📝 **Note** To ensure that each recording has the same starting timecode when starting the source recordings at the same time, the video inputs must be genlocked to the same reference signal (see "Timecode settings" on page 47).

2 Select a recording mode (see "Recording sessions" on page 25).

3 Specify the VS4Recorder Pro settings as detailed in "Settings" on page 31.

4 In Multi-Cam mode and when using VS4Control, enable/disable a source for recording by clicking the Source Selection button in the corresponding source window popover (see "Source window popover" on page 20). Only enabled sources will start recording when the recording session is initiated.

5 You can start and stop the recording of individual sources at any time during a recording session:

– When a source is in the enabled state, click the Source Selection button to start that source recording.

– When a source is recording, the Source Recording button is displayed. Click the Source Recording button to stop recording from that source; this places that source in a disabled state.

– When a source is in the disabled state, click the Source Selection button to re-enable that source.

If you disable the recording, separate video and audio files will be created for each source recording. An input is automatically enabled for recording when a source is connected, and when starting the VS4Recorder Pro application with the source already connected.

Source enabled   Source recording   Source disabled

6 To start a recording session:

– **Multi-Cam mode and when using VS4Control** Click the Session Record button on the Control bar (see "Control bar" on page 17) to start the recording session for all enabled sources.
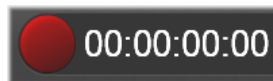
How to record

– **Independent mode**   Click the Record button in the source window popover (see "Source window popover" on page 20) for each source that you want to record.

📝 **Note**   If dropped/skipped frames are detected during a source recording, the Record Status LED in the corresponding source window turns yellow, and a Dropped-Frame indicator appears (see "Record status" on page 26). If you experience a loss of signal, causing a disconnection, a new file is not created and the recording will continue in the original video file. In this case, black video is recorded between connections.

7 To stop a recording session:

– **Multi-Cam mode and when using VS4Control**   Click the Session Record button to stop the recording session for all sources.

📝 **Note**   You can click any Source recording button in a quadrant to stop just that source.

– **Independent mode**   Click the Record button corresponding to the source recording that you want to stop.

8 Once you've stopped recording, a Record Path button appears. Click the Record Path button to open Windows Explorer at the specified source record path to view the recorded files, and the record log file. For more information, see "Record Path button" on page 28.

Multi-Cam mode
(on Control bar)

Independent mode
(in source window popover)

📝 **Note**   For more information on recording using VS4Control, see "VS4Control" on page 51).

Record functionality

This section describes the VS4Recorder Pro record functionality.

Recording sessions

VS4Recorder Pro offers two modes for recording and a multiple-VS4 networking workflow: Multi-Cam mode, Independent mode and VS4Control.

To select a record mode, click the Record Mode button on the Control bar. To record using VS4Control, select the **Enable** button in the VS4Control section:

Set to Multi-Cam mode   **Set to Independent mode**

VS4Control enabled ── VS4Control
                              ■ Enable
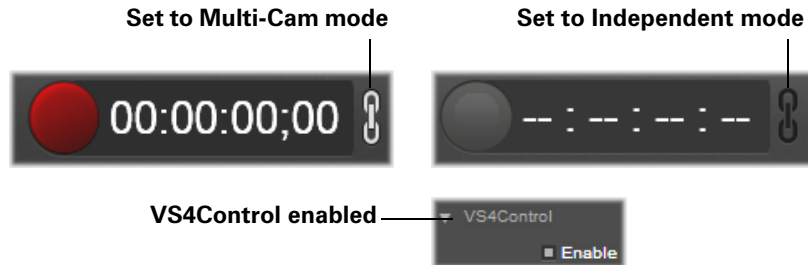
Multi-Cam mode

Allows you to start and stop the recording of up to four sources at the same time using a single record button. This mode is ideal for recording multi-camera live events. Recording in this mode initiates a session timer whereby each source recording shares the same event timecode. The Control bar timer displays frames only when all selected sources are the same frame rate, however, the embedded timecode in each recorded file always contains frames.

You can start and stop individual source recordings separately during a recording session without interrupting the event run-time. In addition, the current duration of each recording is displayed in the corresponding source window popover.

Independent mode

Allows you to start and stop the recording of up to four sources independently using dedicated record buttons. Each source recording is its own recording session. This mode is ideal for quickly recording content for the archiving or repurposing of video assets.

Rather than sharing a unified session timecode, the timecode for each source recording is based on its own duration, which is displayed in the corresponding source window popover. If you choose to embed the VS4Recorder Pro **Session** timecode in your video files, the timecode values are taken from the timer in the respective source window popovers.

Note For information on recording using VS4Control, see).

Recording sessions and timecodes

VS4Recorder Pro includes timecode metadata (see "Viewing VS4Recorder Pro metadata in Adobe Premiere Pro" on page 60) in every recorded video file for easy synchronization in Adobe Premiere Pro CC and CS6. The starting timecode in a video file corresponds to the timecode at the moment when the source recording was started. You can choose to embed the timecode that is present in the SDI source, set a **Session** timecode, or use **System Time** (see "Timecode settings" on page 47). Timecodes are expressed in either drop frame format for 29.97 fps and 59.94 fps sources, or non-drop frame format for 23.98 fps, 24 fps, 25 fps, 29.97 fps, 30 fps, 50 fps and 59.94 fps sources (see "Drop-frame timecode" on page 50).

Disk space indicator

VS4Recorder Pro provides a disk space indicator in each of the source windows (see "Source window popover" on page 20). The indicator provides a visual representation of the available disk space on the source's specified record path disk, and displays the approximate remaining record time before the disk is full. The remaining record time is calculated based on the source's video format and current record settings.

For sources that are set to record to the same disk, if none of the corresponding sources are currently recording, the remaining record time appears for all sources, and is calculated based on all sources. If one or more of the corresponding sources are currently recording, the remaining record time is calculated and shown only for the sources that are recording.

Record status

VS4Recorder Pro includes a Record Status LED and a Dropped-Frame indicator so that you can quickly view the status of your source recordings.

Record Status LED

VS4Recorder Pro includes a Record Status LED in each of the source windows (see "Source window" on page 19).

Green LED (on)
Source is connected
and enabled

Red LED (pulsing)
Source is recording
without incident

Blue LED (pulses briefly)
An event marker has
been created

Yellow LED (pulsing)
Recording currently experiencing
dropped/skipped frames

Remarks

- The green LED indicates that a valid sources is connected; however, if a source is disabled during a Multi-cam session, the green LED will replace the pulsing red LED.
- The red LED pulses when the source is recording.
- If dropped or skipped frames are detected during a source recording, the Record Status LED corresponding to the source turns yellow while the dropped/skipped frames are occurring. The dropped/skipped events for each source recording are logged in the record log file for the recording session (see "Record log file" on page 28).
- The status LED will briefly turn blue when an event marker has been created (see "Event markers" on page 29).

Dropped-Frame indicator

If dropped or skipped frames are detected during a recording session, a Dropped-Frame indicator appears and remains visible until a new recording session is initiated. In Multi-Cam mode, the Dropped-Frame indicator appears on the Control bar (see "Control bar" on page 17) to indicate that at least one of the source recordings experienced dropped/skipped frames. In Independent mode, dedicated Dropped-Frame indicators appear in the source window (see "Source window popover" on page 20) corresponding to the source recording that experienced the dropped/skipped frames.

Multi-Cam mode
(on Control bar)

Independent mode
(in source window popover)

Record Path button

At the end of a recording session, a Record Path button appears either on the VS4Recorder Pro Control bar when in Multi-Cam mode (see "Control bar" on page 17), or in the recording's source window when in Independent mode (see "Source window popover" on page 20). Click the Record Path button to open Windows Explorer at the specified source record path to view the recorded video and audio files, and the record log file. For information on the specific location of the record log file, see "Record log file". In Multi-Cam mode, if different record paths were specified for the source recordings, a separate window will open for each record path. If dropped/skipped frames were detected at any time during a recording session, the Dropped-Frame icon appears within the Record Path button. The button disappears when a new recording session is initiated.

Multi-Cam mode (on Control bar)	**Independent mode** (in source window popover)

Record log file

The record log file provides a breakdown of recording events per source, such as dropped and black frames, file splitting, capture duration (when applicable), and the timecode of when the events occurred. The recording session determines when the record file is generated and where the file is saved.

- **Multi-Cam mode** One record log file is created per recording session, and is generated once the entire recording session is stopped. The record log file includes the breakdown of events for all sources that were recorded during the recording session. The location of the record log file depends on the record path selected:
  - If the **Use same path** option is selected in the VS4Recorder Pro settings, the record log file is located in the same session folder that contains all the video and audio files for the recording session.
  - If the **Use same path** option is cleared, a different session folder is created for each source recording within a recording session. In this case, the record log file is located in the session folder corresponding to Input 1.
- **Independent mode** A separate record log file is generated after each source recording, and is saved in the same session folder that contains the video and audio files for the source recording.

- **VS4Control**   One record log file is created per machine, and they are generated once the entire recording session is stopped. The record log files include the breakdown of events for all sources that were recorded from their respective machines during the recording session. The location of the record log files depend on the record path selected:
  - If the **Use same path** option is selected, the record log files are located in the same machine-specific folder that contains all the video and audio files of the inputs of that machine.
  - If the **Use same path** option is cleared, different folders are created for each source recording on a machine. In this case, the record log files are located in the session folder corresponding to Input 1 of each machine.

Event markers

You can add event markers to your video to mark an event of interest, making that moment easy to locate. The event markers you add in VS4Recorder Pro will be visible when you add the video to a timeline for editing in Adobe Premiere Pro CC or CS6.

How event markers work

To create event markers, the VS4Recorder Pro application must be the active window on your computer, and you must be recording at least one file. The event markers are written to all captured video files.

For example, you may want to mark when a team scores in a sporting event, or a specific crowd interaction at a concert. You can add event markers in Multi-Cam and Independent modes, or when using VS4Control.

Note   Event markers can be added to *.mov*, *.avi*, and *.mp4* video files, but not audio files.

Adding event markers to your video recording

1 Start your recording session.
2 Press asterisk (*) from any machine, Master or slave, when you see an event of interest (the status LED will briefly turn blue).
3 Add more markers as needed.

You can now see where these events occurred in your video editing timeline in Adobe Premiere Pro.
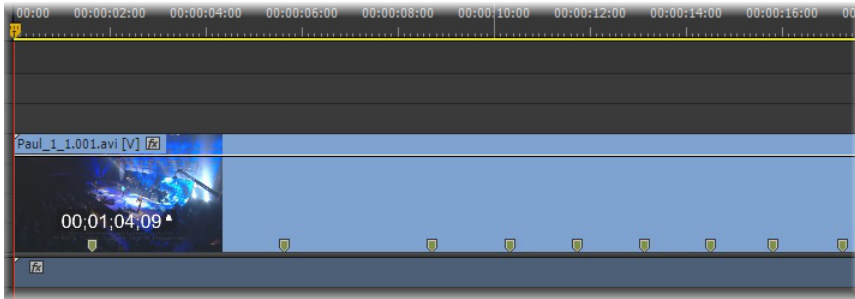
- Event markers are also good visual cues for verifying that files are in sync when editing. Event markers in a set of split video files on the timeline can help in the adjustment any offset files in the set.

Settings

This section explains the VS4Recorder Pro settings.

Accessing the VS4Recorder Pro settings

To open the VS4Recorder Pro **Settings** window, click the Settings button on the Control bar (see "Control bar" on page 17).

Session and Machine names

As captured video files are created and saved, a naming convention is applied to make them easy to locate and identify. For more information, see "File naming convention" on page 35. The **Session Name** is the name you enter for the recording/capture session. The **Machine Name** is the name you use to identify the computer in use. These names are customizable, depending on the situation.

Note The session and machine names are persistent. Their default values are UntitledSession, and the machine's (actual) computer name.

The **Session Name** is limited to 16 characters and all the characters must be valid filename characters (the session name can be used in the filename and folder name).

Note In a VS4Control scenario, if you would like machines to share the same session name, you must configure each machine individually.

A custom **Machine Name** is limited to 16 characters, and all the characters must be valid filename characters (the machine name can be used in the filename).

Including the Session or Machine name in the filename

The naming convention applied to video files make them easy to identify. Before your recording session begins, you may use the **Include in Filename** drop-down menu to choose whether or not to include the **Session Name** or the **Machine Name** in the save file name. You can select either **Session**, **Machine**, or **Both**. If you do not want the **Session** or **Machine** names included in the filename, select **None**.

Important You can only append the session name to the captured file in Multi-Cam mode, or when using VS4Control. In Independent mode, the session name is grayed out.

Source settings

VS4Recorder Pro automatically detects the format of each valid input source, and displays it in the **Settings** window. The VS4 independent inputs allow you to use HD and SD sources in the same production. However, when connecting sources with different video formats, the sources must have compatible frame rates (see "Supported input formats" on page 10).
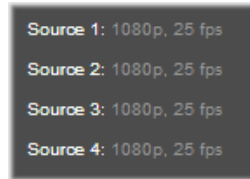
Working with 1080i/PsF and SD sources

Some PsF and SD 16:9 video signals do not include scan mode or aspect ratio information as part of the signal. To avoid possible errors in detection when the input source is 1080i/PsF at 25/29.97 fps, NTSC, or PAL, VS4Recorder Pro requires that you indicate whether or not the 1080 source is **PsF**, and whether or not the NTSC/PAL source has a **16:9** aspect ratio.

Record Path

VS4Recorder Pro allows you to specify a single record path for all source recordings, or a separate record path for each source.

- To specify one record path for all sources, under **Session and File**, select the **Use same path** option, and then click the folder icon to browse to the desired destination. This is especially useful in Multi-Cam mode and when using VS4Control, as all video and audio files that are created during a recording session will be stored in the same session folder.

- To specify a separate record path for each source, under **Session and File**, clear the **Use same path** option, and then click the folder icon for each source to browse to the desired destination. In this case, a separate session folder is created for each source recording.

Record path buttons
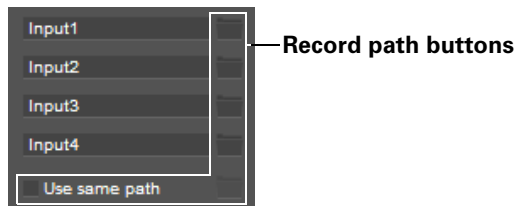
Session folders

VS4Recorder Pro organizes your source recording files into session folders. How session folders are created and the naming of the session folders depends on the recording configuration:

- **Multi-Cam mode and when using VS4Control**   If the **Use same path** option is selected in the VS4Recorder Pro settings, a single session folder is created for the entire recording session, wherein the video and audio files for all source recordings are saved.

The folder name is in the following format:

SessionName-YYYY-MM-DD HHMMSS

If the **Use same path** option is cleared in the VS4Recorder Pro settings, a separate session folder is created for each of the source recordings in the source's specified record path. The folders are differentiated by the source input number in the following format:

SessionName-YYYY-MM-DD HHMMSS_input

• **Independent mode** A separate session folder is created for each of the source recordings in the source's specified record path. The folders are differentiated by the source input number in the following format:

YYYY-MM-DD HHMMSS_input

Files and file naming

Depending on the selected video codec, the recorded video file format will be either *.avi*, *.mov*, or *.mp4*. If you choose to include audio with your recording, the first two audio channels from the input source are embedded in the video file, and separate PCM (*.wav*) or AAC (*.aac*) audio files are created based on the specified audio settings.

Note   Separate *.wav* and *.aac* files follow path and naming convention of the corresponding source video file.

Specifying the save file name

Under **Session and File**, in the **Filename** box for each source, specify the save file name that you want for the source's recorded video/audio files. For information on the file naming convention, see "File naming convention" and "How files are named".

Note   You can set VS4Recorder Pro to display the source filename in the corresponding source window (see "Label and filename overlay" on page 57).
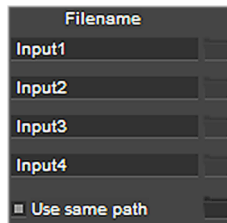
Tip   Even if a source is currently recording, you can set up the next recording for that source by changing the source **Filename** and **Label** in the **Settings** window. The current filename and label settings apply to the source's next recording. Once a source recording has started, you can change these settings without affecting the current recording.

File naming convention

As captured video files are created and saved, a naming convention is applied to make them easy to locate and identify. The naming convention follows a specific order of identifiers; however, the saved video file path changes somewhat depending on your settings. For example, the **Include in Filename** drop-down menu options, the use of file splitting, or choosing to record in Stereo or Mono all have an effect.

How files are named

The save file name applies to both the video and audio files that are recorded for a source; however, the file naming convention differs based on the recording. The starting and stopping of the recording session or of a single input, creates new incrementing indexes following the input number. File splitting creates a 3-digit index before the file extension.

You can have more than one recording for a given source during the same recording session. In this case, the files are differentiated by a recording number (index). This occurs when:

- You disable a source that is currently recording, and then re-enable the same source during the same recording session. This results in a different file for each sequence.
- If you experience a loss of signal, causing a disconnection, the recording will continue in the original video file, with black video recorded between connections.
- You enable file splitting, which splits the captured video files at set intervals. Every time the split time limit elapses, a new file with a unique file name is created. For more information, see "Automatic file splitting" on page 38.

Audio files

If you choose to include audio with your recording (see "Audio settings" on page 45), the first two audio channels from the input source are embedded in the video file, and separate audio files are created as specified in the VS4Recorder Pro settings. The separate audio files are named the same as the corresponding source video file, except that they also include the audio channel type (mono or stereo) and an incremental suffix using the following convention:

filename_input_recordingnumber_channeltypesuffix or

filename_channeltypesuffix

Note When recording eight audio channels, if you choose to create mono files instead of stereo files, eight files will be created instead of four, and the files will be named *Record_Mono1*, *Record_Mono2*, *Record_Mono3*, and so on.

File naming based on recording session

As captured video files are created and saved, a naming convention is applied. Although the naming convention follows a specific order, the file naming convention differs based on the recording configuration:

- **Multi-Cam mode**

sessionname_date_time\filename_sessionname_machinename _InputIndex _index.fileextension

- **Independent mode**

date_time_input\filename_machinename.fileextension

- **VS4Control**:
    - **Master machine**:

sessionname_date_time\filename_sessionname_machinename_mx _InputIndex_index.fileextension

    - **Slave machine**:

sessionname_date_time\filename_sessionname_machinename_mx_sx _InputIndex_index.fileextension

Remarks

- *mx*: Masterindex
- *sx*: Slaveindex
- *InputIndex*: The SDI input on the VS4

The *index* is incremented when an input is stopped and/or started during a capture session.

Labels

In addition to filenames, you can also give a descriptive label to each source. For example, you can label source 1 as *Camera 1*. VS4Recorder Pro can be set to display the source labels in the respective source windows (see "Label and filename overlay" on page 57), and the label information is embedded in every recorded video file as XMP metadata for use in Adobe Premiere Pro CC and CS6 (see "Viewing VS4Recorder Pro metadata in Adobe Premiere Pro" on page 60).

Tip Even if a source is currently recording, you can set up the next recording for that source by changing the source **Label** and **Filename** in the **Settings** window. The current filename and label settings apply to the source's next recording. Once a source recording has started, you can change these settings without affecting the current recording.

Under **Session and File**, specify a descriptive label in the **Label** box for each source.
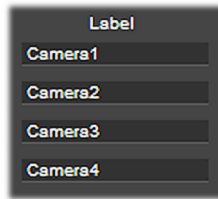
Capture duration

You can set a capture duration limit that stops a recording session after a specific time limit. Once the limit is reached, the recording session will stop automatically.

How capture duration works

A helpful feature of setting a capture duration is the option of unattended recording. The **Capture duration** feature operates in minute increments, and the minimum settable duration is one (1) minute. This setting applies to all inputs. The timer starts once you begin to record. If you do not wish to limit your recording time, you must clear the **Capture duration** option button.

Tip When capturing *.mp4* files, enabling **Capture duration** creates streamable files.

Capture duration functions differently depending on the recording configuration:

- **Multi-Cam mode**:
  - One timer is set for all inputs.
  - When you stop the recording session, the timer resets.
  - When you connect another feed (input) while capturing, the timer will continue (no reset).
  - If an input is disabled, and then re-enabled while capturing, the timer will continue (no reset).
- **Independent mode**:
  - The timer operates independently for each input.
  - When you stop capturing on an input, it resets the timer of that particular input.
  - When you connect another feed (input) while capturing, the timer will continue (no reset).

- **VS4Control**:
  - The time limit is set and controlled through the settings of the Master only (the slave settings are ignored).
  - When you stop the Master, the recording stops and the timer resets.
  - The Capture duration option will not be available for slave units (see).

Setting a capture duration

Setting a capture duration means stopping your recording session at an exact time, which can be convenient when your sources are at a distance. Before beginning your recording session:

1 Select **Capture duration** in the **Session and File** section of the VS4Recorder Pro settings.

2 Enter the time limit in minutes.

3 Set your other preferences in the **Settings** window.

4 Start recording.

The (internal) timer on your capture duration limit begins, and will stop the session at the designated time.

Automatic file splitting

You can split your recording at set intervals, creating separate files. Every time the split time limit elapses, a new file with a unique file name is automatically created.

How file splitting works

Operating like an auto save, the **Split file every** option saves separate video and audio files to a folder you specify, that you can start editing as soon as each one is created. File splitting causes no loss of video frames between files and *.mov, .avi,* and *.mp4* files are supported.

By splitting video files, you can also protect your files, ensuring that only the current file being captured would be affected by a sudden power failure or computer crash. The file splitting feature operates in minute increments, and the minimum settable duration is one (1) minute. This setting applies to all inputs. The timer starts once you begin to record. If you do not wish to create split files, you must clear the **Split file every** option button.

Tip When capturing *.mp4* files, file splitting creates streamable files.

File splitting functions differently depending on the recording configuration:

- **Multi-Cam mode**:
  - One split timer is set for all inputs.
  - When you stop the recording session, the split timer resets.
  - When you connect an input while capturing, that input will split at the scheduled interval without resetting.
  - When you disconnect and reconnect an input while capturing, that input will split at the scheduled interval without resetting.

- **Independent mode**:
  - The split timer operates independently for each of the inputs.
  - When you stop capturing on an input, it resets the split timer of that particular input.
  - When you connect an input while capturing, that input will split at the scheduled interval without resetting.

- **VS4Control**:
  - The split timer operates independently for each machine, so you must set the interval on each individual machine (in order for all machines to start when the Master starts the recording session).
  - All split timers start when the Master starts.
  - When you stop recording from the Master, it resets the split timer on all machines (see).
  - When you connect an input while capturing, that input will split at the scheduled interval without resetting.
  - When you disconnect and reconnect an input while capturing, that input will split at the scheduled interval without resetting.

Splitting audio and video files

File splitting lets you start editing (with a suitable application) before the recording session has ended. Before beginning your recording session:

1 Select Split file every in the **Session and File** section of the VS4Recorder Pro settings.

2 Enter the time in minutes.

3 Set your other preferences in the **Settings** window.

4 Start recording.

The (internal) file splitting timer begins, and will save a file at each designated interval.

Split file naming

An automatic naming convention is applied to split video files. An index will be appended to the split file (see "File naming convention" on page 35). However, if a file name is changed during a capture, the next split file will not get the new file name (as its base file name). The new file name is only applied whenever a recording session (Independent, Multi-Cam or VS4Control) is stopped and then restarted after the change is made, or when reconnecting an input (during a capture) with a different resolution.

Splitting WAV audio files

Depending on your audio settings, when you record separate *.wav* files along with your video, the *.wav* files have a maximum size of 4 GB, which also makes for a maximum time duration. If you wish to capture a lengthy separate *.wav* file, file splitting will be required, to make *.wav* files that will respect the size limitation (see "WAV files" on page 46).

Splitting AAC audio files

You can capture AAC codec data when recording:

- H.264 *.mp4* or H.264 *.mov*
- AAC files as separate audio files

(i) **Important** When file splitting is enabled, AAC is not available for separate audio files.

Video codec

Select specific video codecs for HD and SD sources. The selected codec will be used for all subsequent HD and SD recordings. For more information, see "Advanced settings" on page 44.

If you choose to include audio with your recording, the first two audio channels from the input source are embedded in the video file as PCM audio, or AAC audio when using the H.264 codec, and separate audio files are created as specified in the VS4Recorder Pro setting.

Remarks

- If recording files using an H.264 codec, the resulting *.mov* or *.mp4* file will include either stereo or mono embedded AAC audio, depending on your audio settings.
- If recording files using the MPEG-2 I-frame codec, the resulting *.avi* file will include embedded stereo PCM audio.
- If recording files using a DV codec, the resulting *.mov* file will include either stereo or mono embedded PCM audio, depending on your audio settings.

For more information, see "Audio settings" on page 45.

Note   When selecting a video codec, make sure that the codec is supported in your editing application. Working with MPEG-2 I-frame *.avi* files requires a system with the appropriate Matrox codec installed. For details, see "Working with editing applications" on page 60.
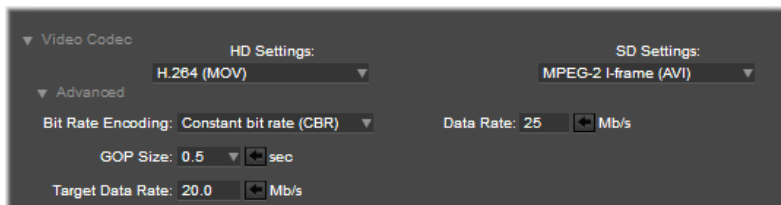
HD settings

Under **Video Codec**, from the **HD Settings** menu, select the video codec that will be used for all subsequent HD recordings:

- **H.264 (MOV, MP4)**   Creates either an H.264 *.mov* or *.mp4* file (selectable) with embedded stereo or mono AAC audio. If this option is selected, you can:
  - Set the **Bit Rate Encoding** to either Constant (CBR) or Variable (VBR).
  - Set the **GOP Size** to a seconds value of 0.5, 1, 2 or 5.
  - Set the **Target Data Rate** to a value in Mb/s.
  - Set the **Max Data Rate** to a value in Mb/s
  - Click ◄ to set the GOP size, target or max data rate to the default HD value.
  - Set the **AAC Data Rate**, in the **Audio Codec** section, to a value in Kb/s.
- **MPEG-2 I-frame HD (AVI)**   Creates an MPEG-2 I-frame *.avi* file with embedded stereo PCM audio. If this option is selected, specify the **Data Rate** (in Mb/s) at which the MPEG-2 I-frame codec will record your source video.
  - You can set the **Data Rate** to any value between 50 Mb/s and 300 Mb/s.
  - Click ◄ to set the data rate to the default HD value.

Note   MPEG-2 I-frame *.avi* files are not supported in Avid editing applications on Windows systems.

- **DVCPRO HD (MOV)**   Creates a DVCPRO HD *.mov* file with embedded stereo or mono PCM audio. DVCPRO HD does not support 1080p @ 24 fps input sources for recording. If a 1080p @ 24 fps input source is detected, the MPEG-2 I-frame codec will be used instead.

SD settings

Under **Video Codec**, from the **SD Settings** menu, select the video codec that will be used for all subsequent SD recordings:

- **MPEG-2 I-frame (AVI)**   Creates an MPEG-2 I-frame *.avi* file with embedded stereo PCM audio. If this option is selected, specify the **Data Rate** (in Mb/s) at which the MPEG-2 I-frame codec will record your source video:

  − You can set the data rate to any value between 10 Mb/s and 50 Mb/s.

  − Click ⬅ to set the **Data Rate** to the default SD value.

✎ **Note**   MPEG-2 I-frame *.avi* files are not supported in Avid editing applications on Windows systems.

- **DV/DVCAM (MOV)**   Creates a DV/DVCAM *.mov* file with embedded stereo or mono PCM audio.

- **DVCPRO (MOV) and DVCPRO50 (MOV)**   Creates a DVCPRO or DVCPRO50 *.mov* file with embedded stereo or mono PCM audio.

✎ **Note**   You can make SD recordings using the H.264 codec (see "HD settings")

H.264 video capture

The VS4Recorder Pro offers real-time video capture to H.264 using Intel's Quick Sync Video (QSV) technology (available with i7 processors).

✎ **Note**   If QSV technology is not present or not enabled, the H.264 codec will not be available in the **Settings** dialog.

If the on-board Intel GPU is used as the main display and for encoding to H.264, it can result in dropped frames and/or a sluggish UI, because the same GPU is being used to perform two intensive tasks (encoding four streams to H.264 and displaying four live windows). For that reason, it is recommended to use a separate GPU as the main display for a better experience.

Long captures in H.264

If you choose to capture H.264 (*.mp4* or H.264 *.mov*) files with a set capture duration of over 480 minutes (8 hours), the *.wav* audio format will be automatically selected and file splitting will automatically create a new video file every 480 minutes. You can choose your own split file interval (starting at 1 minute). This restriction does not exist for *.avi* or DV and DVCPROHD *.mov* files; however, depending on the split value you set, be sure to select the right settings for the *.wav* files (see "WAV files" on page 46).

✎ **Note**   Streamable files are created when capturing *.mp4* files with either automatic file splitting or capture duration enabled.

QSV display setup

To setup QSV on a desktop PC with Intel® i7 processors, and an additional NVIDIA or AMD PCIe graphics card installed (without having to connect an additional monitor), you should:

1 Confirm that your CPU supports QSV technology.

2 Enable your Intel graphics card to work with Intel integrated graphics (iGPU) in BIOS and save changes.

3 Install the latest Intel graphics drivers (strongly recommended). QSV acceleration may not be available or not work with old graphics drivers.

4 Go to your **Screen Resolution** settings, and click **Detect** to expose inactive video outputs.

5 Select the detected "Available display output on: Intel® HD Graphics". From the **Multiple displays** drop-down, select "Try to connect anyway on: VGA" and then click **Apply**.

Change the appearance of your displays
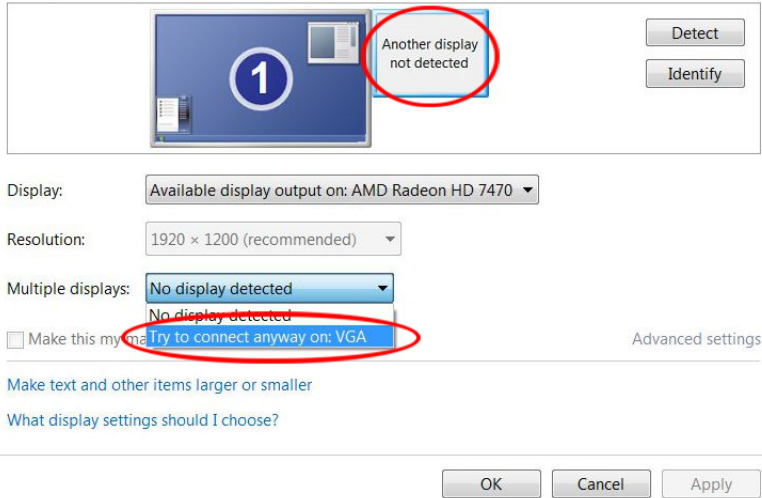
6 Select the newly connected Intel® HD Graphics VGA display, and then from the **Multiple displays** drop-down, select "Extend these displays". Click **Apply**, then **Keep changes**, and then **OK**, to close the Screen Resolution settings.

7 Open your VS4Recorder Pro application, display the Settings and select an H.264 file format in the **Video Codec** section, as the options of H.264 (MP4) and H.264 (MOV) should be available.

Advanced settings

Depending on your video codec selection, different advanced options are available to suit your project requirements. The video codecs have applicable encoding types. Depending on the codec selected, you can set the encoding to either Constant or Variable:

- **Constant bit rate (CBR)**   Video is compressed at your specified target data rate, which is useful when you need to limit or predict the size of your video file. However, if your video is very complex (such as scenes with many colors, sharp edges, or transitions), you'll need to specify a high target data rate to avoid having frames of blocky video in your file.

- **Variable bit rate (VBR)**   Video is compressed at varying data rates based on the complexity of the video and your specified maximum data rate. The applicable codecs analyze and encode each frame to deliver the highest possible quality at your target data rate.

Only the **Target Data Rate** will be available if you selected Constant bit rate (CBR). If you select Variable bit rate (VBR), three other settable controls will be available: The GOP size, the target and maximum data rates for the video compression.

Audio settings

You can choose whether or not to record audio along with your video. The following sections detail the audio settings for recording.
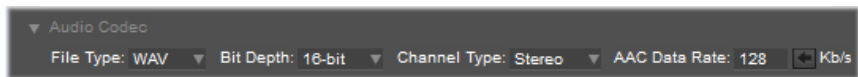
Enabling audio and selecting audio channels

If you enable a source's audio for recording, the first two audio channels from the input source are embedded in the video file as PCM or AAC audio, and separate audio files are also created. The embedded audio in the video file and separate audio files can be either stereo or mono, depending on your settings.

If you are using the MPEG-2 I-frame video codec, the embedded PCM audio in the *.avi* video file is always stereo. You can choose to record the first two, four, six, or eight audio channels as separate stereo or mono audio files. If you disable a source's audio for recording, audio will not be embedded in the source's video file, and separate audio files will not be created for the source recording.

To enable source audio for recording, under **Session and File**, select the source's corresponding **Audio** box, and then select the number of audio channels that you want to record as separate audio files (**2**, **4**, **6**, or **8**). To disable source audio for recording, under **Session and File**, clear the source's corresponding **Audio** box. Source audio is automatically enabled for recording when a source is connected, and when starting the VS4Recorder Pro application with the source already connected.

 📝 **Note** A source's audio channel setting also determines the number of audio channels that are visible in the source's VU meter. If source audio is disabled, the source's VU meter will not appear. See "VU meters" on page 50 for more information.

File type

Under **Audio Codec**, select the type of separate audio files that you want to create:

- **WAV** Records PCM audio to separate *.wav* files.
- **AAC** Records AAC audio to separate *.aac* files.

File Type: AAC ▼
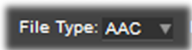
WAV files

The WAV audio format has a restriction; namely, *.wav* files have a maximum size of 4 GB. This means that depending on your audio settings, when you record separate *.wav* files along with your video, the *.wav* files are limited to a maximum duration.

If you wish to capture a lengthy separate *.wav* file, use file splitting to make several *.wav* files that will respect the size limitation, while still being able to capture the full duration of your recording (see "Automatic file splitting" on page 38).

 📝 **Note** This restriction does not apply to separate *.aac* audio files or to the embedded audio in the video file, which can last as long as the associated video.

The following table lists the approximate maximum duration for a separate *.wav* audio file based on the audio settings:

Audio Channel Type	Audio Bit Depth	Approximate Maximum Duration
Mono	16-bit	12 hours
	24-bit	6 hours
Stereo	16-bit	6 hours
	24-bit	3 hours

AAC files

You can capture AAC codec data when recording:

- H.264 *.mp4* or H.264 *.mov*
- AAC files as separate audio files

When file splitting is enabled, AAC is not available for separate audio files.

Bit depth

Select the bit depth that you want for the two channels of embedded PCM audio in your video file, and the separate audio files that are recorded.

Bit Depth: 24-bit ▾

Channel type

Select the channel type that you want for all the separate audio files that are recorded. If recording to an *.mov* video file (see "Video codec" on page 40), this setting also applies to the audio that is embedded in the recorded video file.

- **Mono**   Creates a separate *.wav* or *.aac* audio file for every selected channel. For example, if four audio channels are selected, four mono audio files will be created. The embedded audio in an *.mov* file will also be mono (not supported for embedded audio in an *.avi* file, which is always stereo).

- **Stereo**   Creates a separate *.wav* or *.aac* audio file for each audio pair selected. For example, if four audio channels are selected, two stereo audio files will be created. The embedded audio in an *.avi*, or *.mov* file will also be stereo.

Channel Type: Stereo ▾

Data rate

If AAC is selected as the audio file type (see "File type" on page 46), specify the bit rate (in Kb/s) that you want for all the separate audio files that are recorded. You can set the data rate to any value between 32 Kb/s and 512 Kb/s.

Note   This setting also affects the enbedded audio when capturing video in H.264.

AAC Data Rate: 128 ◀ **Kb/s**

Timecode settings

VS4Recorder Pro includes timecode metadata in every recorded video file for easy synchronization in Adobe Premiere Pro CC and CS6. The starting timecode in a video file corresponds to the timecode at the moment when the source recording was started. You can choose to embed the timecode that is present in the SDI source, or the VS4Recorder Pro session timecode. Select **System Time** to embed the current time in the video files (see "System Time" on page 49).

Note   Previously, embedded timecode present in any source would be used for the corresponding input. Now, this is only possible when recording in Independent mode; otherwise, it will be taken from Input 1 only.

To set the embedded timecode option, under **Timecode**, select one of the following:

- **SDI Embedded**   The starting timecode value for the recorded video file is based on the timecode present in the SDI video signal.
- **Session**   The starting timecode can be set to a valid value.
- **System Time**   The timecode is taken from the local computer configuring the VS4Recorder Pro settings.
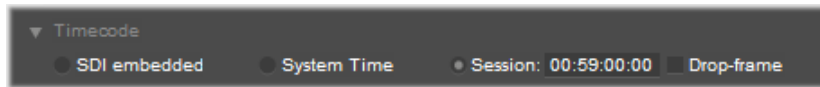
Using a timecode from an SDI embedded video signal

If you choose to embed the timecode that is present in the SDI source, select the SDI embedded option button in the Timecode section of the VS4Recorder Pro **Settings** dialog. SDI embedded timecode use differs depending on the recording configuration:

- **Multi-Cam mode**   There must be a signal coming in from a source connected to Input 1 when you start the recording session.
  - If another input is recording at a different frame rate than Input 1, then the timecode on that input's captured file(s) will be that of its own embedded timecode, different from the other inputs. If that input does not have an embedded timecode, then the **Session** timecode will be written to the video file(s) instead.
  - If an input starts capturing only after the recording session has begun, it is the SDI timecode from the start of the recording session that is written to the video, plus the offset (the input's staggered start time).
- **Independent mode**:
  - The SDI embedded timecode of each individual input will be used.
  - If no SDI timecode is present, the recording Session timecode will be written instead.
- **VS4Control**   The same applies as it does in Multi-Cam mode. The timecode is taken from Input 1 of the Master machine.

(i) **Important**   Ensure that all cameras (sources) are genlocked to the same source (Input 1) and that it is a valid source. Without it, frame-accuracy cannot be achieved.

Session timecode

You can tailor your session timecode to your needs with the **Session** option, starting the timecode at a value of your choosing. If you choose to embed the **Session** timecode in your recorded video files, note the following:

- **Multi-Cam mode**   The starting timecode value is based on the session timer on the Control bar (see "Control bar" on page 17).

- **Independent mode**   The starting timecode value is based on the timer in the respective source window popovers (see "Source window popover" on page 20).

- **VS4Control**   The starting timecode value is based on the session timer on the Control bar of the Master.

How Session timecodes work

Embedding a **Session** timecode of your own selecting in your video files, where you set the exact hour, minute, second, and frame your recording timecode will begin, requires certain conditions:

- The starting timecode cannot be changed while a recording is underway.

- The source window will display the starting timecode (written to the XMP metadata) only for files that began at the start time of the session.

- The timecode of any file that starts recording later, will be written as the start timecode plus the offset (the input's staggered start time).

- The number in the frame field cannot be greater than the number of frames per second, minus 1 of the current frame rate. For frame rates of 50fps and 60fps, the frame field is limited to 49 and 59 respectively.

- If Drop-frame is selected, frame numbers 00 and 01 of the first second of every minute are not valid, except for when the number of minutes is divisible by ten.

Note   Both the starting timecode and drop-frame (see "Drop-frame timecode") settings are saved for the next time the VS4Recorder Pro is used. These settings can only be used when the VS4Recorder Pro is:

- In Multi-Cam mode or when using VS4Control
- The frame rates of all the selected inputs are the same
- The Session time code is selected

Setting the starting Session timecode

1 Select **Session** in the **Timecode** section of the VS4Recorder Pro settings.

2 Enter valid time values in the adjacent field.

3 Start the recording session.

The timecode, as set, increments from the starting value.

System Time

You can choose to embed the current time in the video files by selecting the **System Time** option. The system time is taken from the local computer configuring the VS4Recorder Pro settings.

This selection makes the time-of-day, as interpreted by the machine, the recording starting value, and the time-based timecode increments in the control window once the recording starts. When not recording, with this option selected, the previous session's timecode is displayed.

📝 **Note** When using VS4Control, this option will only be available on the Master.

Drop-frame timecode

VS4Recorder Pro gives you the option to use a drop-frame or non-drop-frame timecode in your recording session. Select the **Drop-frame** option button to embed your timecode in the drop-frame format.

For NTSC video, timecode is normally produced by a generator that counts at 30 frames per second. NTSC color signals, however, actually have a display frequency close to 29.97 frames per second. Drop-frame timecode compensates for this time difference by dropping two frames from the count every minute except for every tenth minute so that the timecode matches clock time.

Remarks

- A drop-frame timecode is formatted and will display as: HH:MM:SS;FF
- A non drop-frame timecode is formatted and will display as: HH:MM:SS:FF

VU meters

VS4Recorder Pro includes VU meters in each of the source windows (see "Source window" on page 19) that allow you to visually monitor the audio levels of up to eight audio channels per source. The VU meters can display two, four, six, or eight channels depending on the number of audio channels to record, and show the VU peak per channel. The VU meters can also be set to remain on screen, or auto-hide after a period of mouse inactivity. The following sections detail how to display and customize the VU meters.

Enabling VU meters

To display the VU meters, you must enable the **VU Meter** option in the **Settings** window by selecting **ON**. The number of audio channels that are visible in a source's VU meter depends on the number of audio channels that are being recorded for that source. If a source's audio is disabled for recording, the source's VU meter will not appear (see "Enabling audio and selecting audio channels" on page 45).

Show VU peak

When **Peak** is selected, the VU meters indicate the highest audio level (peak) that is reached for each channel during a source recording. If at any point the audio level for a given channel goes above 0 dBFS, the peak LED illuminates and remains illuminated for the duration of the source recording.

Once the peak LED illuminates, the peak indicator no longer appears for the duration of the source recording.

📌 **Tip**　You can reset the VU peak by double-clicking the VU meter in the source window.

Peak LED

Peak indicator
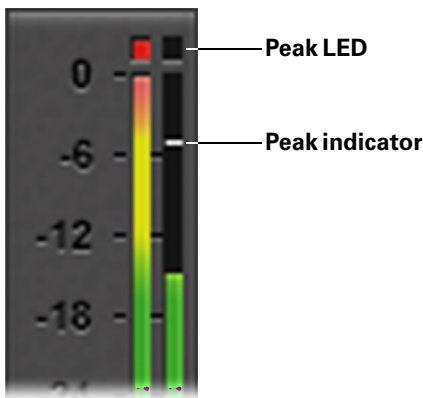
Auto hide

When **Auto hide** is selected, VU meters appear only when mouse activity occurs over the VS4Recorder Pro source windows, and disappear after a period of mouse inactivity.

VS4Control

You can enable or disable VS4Control from the option button at the bottom of the VS4Recorder Pro **Settings** dialog. VS4Control allows you to capture an unlimited number of SDI streams at the same time (each computers with a VS4 card). One VS4, set as a master, can synchronize the capture on four computers (one master, three slaves) over a network. Recording using VS4Control is like recording in Multi-Cam mode, but with the ability to link with more machines and sources.

For a VS4Control recording session, you require:

- A network. All systems must be on the same subnet.
- A valid source connected to Input 1 of each networked machine.
- All cameras genlocked to the same source.
- All cameras output at the same resolution (same frame size and rate).

VS4Control status pane

The VS4Control status pane is where all pertinent information regarding your VS4Control recording session is located, such as your session's Multicast IP address (see "Multicast IP address" on page 53), the machine names, and the machine statuses. The machine statuses are as follows:

- **Ready**   The machine is ready to record and is waiting to receive a start to record command from the Master, or a slave is ready to capture in the next recording session (joining a group that is currently recording).
- **Recording**   The machine is currently recording/capturing.
- **Not responding**   The machine joined a group, but is not responding (perhaps due to a crash).

Note   As soon as a machine joins the group, it notifies the network that it is connected and accessible. If a notification is missing, the machine that is not responding will be tagged with a **Not responding** status.

Master and slave machines

Each computer used to capture the video files during your VS4Control recording session has a machine name for identification.

Note   When using VS4Control, the **Session Name** is the name of the master machine's session.

Before starting a VS4Control recording session, you should select which machine will be the Master, configuring the settings. Selecting either **Master** or **Slave** affects the available options and display:

- The title bar of the control pane will update with the corresponding Master or Slave selection.
- Selecting **Slave** disables the Record button on the machine currently in use; whereas selecting **Master** will enable it.
- The VS4Control status pane will update.

Whenever VS4Control is enabled, the first machine set to **Master** will cause the other machines on that network to set to **Slave**.

Remarks

- If Input 1 of the Master is disconnected during a capture, the session will continue capturing, but only black frames will be captured on Input 1 of the Master.

- To stop the session on the slaves, you will have to disable VS4Control.

- If the Master becomes inoperative during the capture:
  − The slaves will continue to capture.
  − When restarting the VS4Recorder Pro on the Master, the Master will be able to join the group, while the slaves continue capturing.
  − Pressing the Record button on the Master will start the capture on the Master without affecting the recording on the slaves.
  − Stopping the capture on the Master will stop the session (Master and slaves will stop).

- If a slave becomes inoperative during the capture, the session continues on the Master and functional slaves.

- During a capture:
  − A slave can exit the VS4Control via the **Settings** dialog. If the slave was capturing, then the capture will be automatically stopped and the main Record button becomes available. The machine can rejoin the group as a slave, but the capture will not start automatically. For this machine to capture, the Master must stop, and then restart the capture.
  − A machine can only join the group as a slave, and a Master cannot leave the group (unless having become inoperative).

(i) **Important**   Once a machine in a group has been assigned Master on the specified multicast IP address with VS4Control enabled, it will not be possible to set another machine to Master in that group.

✎ **Note**   **Master** and **Slave** settings are saved in the settings of the VS4Recorder Pro and reloaded when the application is launched.

File splitting and Capture duration using VS4Control

You can split captured video files at set intervals or set a capture duration limit that stops a recording session after a specific time limit to protect and better manage the storage of your video files. For more information, see "Capture duration" on page 37 and "Automatic file splitting" on page 38.

✎ **Note**   The **Capture duration** option will not be available for slave units.

Multicast IP address

The use of a Multicast IP address is what allows for several VS4 units to be centrally connected, as slaves, to one VS4, as a master.

When first opening VS4Recoder Pro, a (valid) default multicast IP address is displayed in VS4Control, but it can be changed (an entered address will be validated). The change must be done on all the machines connected to the same Master.

Since the Multicast IP address is editable, anyone joining an address on a network is part of one group session; however, you can use several addresses within a network, where smaller groups can work independently, with their own master and slave machines, but still part of the same network.

(i)   **Important**   In order to change the Multicast IP address, you must first disable VS4Control.

Audio monitoring

You can monitor any audio pair from one input source by enabling audio monitoring for the source in the corresponding source window. VS4Recorder Pro automatically directs the selected audio pair to your computer's sound card for monitoring through the computer speakers.

Tip   You can also use the VU meters to visually monitor up to eight audio channels per source. For more information, see "VU meters" on page 50.

Enabling/disabling audio monitoring

To enable/disable audio monitoring for a source, click the Audio Monitoring button in the corresponding source window popover (see "Source window popover" on page 20).

Audio monitoring enabled   **Audio monitoring disabled**

Selecting the audio pair to monitor

To select the audio pair to monitor, hover the mouse pointer over an Audio Monitoring button to open the channel selection flyout, and then click the desired audio pair.

View modes

The VS4Recorder Pro interface offers different modes for viewing your input sources. You can choose to view all four input sources simultaneously in quad-view mode, or cycle through isolated inputs for viewing in single-view mode. VS4Recorder Pro also includes a full-screen option for both source-view modes. You can switch between the VS4Recorder Pro view modes at any time without affecting the recording, and all view modes offer the same on-screen display and record functionality.

Tip You can use the VS4Recorder Pro shortcut keys to switch between the various view modes (see "Keyboard shortcuts" on page 58).

Source view

VS4Recorder Pro offers two modes for viewing your input sources: quad-view mode and single-view mode.

Quad-view mode

This mode displays all four source windows within the current VS4Recorder Pro interface.

To switch from single-view mode to quad-view mode, click the Source View button in any of the source window popovers (see "Source window popover" on page 20). You can also double-click the source window in single-view mode to switch to quad-view mode.

Single-view mode

This mode displays only one source window by expanding the selected source window to fill the entire VS4Recorder Pro window area. When in single-view mode, you can cycle through the different inputs using the VS4Recorder Pro shortcut keys (see "Keyboard shortcuts" on page 58).
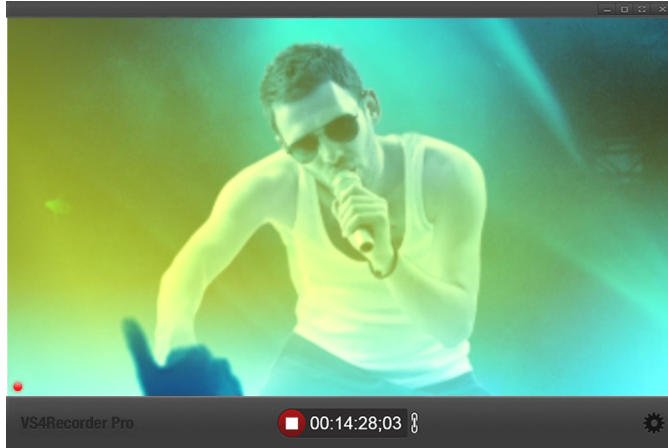
To switch from quad-view mode to single-view mode, click the Source View button in the source window popover for the source window that you want to expand (see "Source window popover" on page 20). You can also double-click a source window to switch to single-view mode for that source.

Full-screen mode

VS4Recorder Pro's full-screen mode lets you expand the current source window area (quad-view or single-view) so that it fills the entire screen. You can switch between the two source-view modes (quad or single) and access all VS4Recorder Pro functionality when in full-screen mode.

When in full-screen mode, the VS4Recorder Pro View bar and Control bar appear only when mouse activity occurs on the screen, and disappear after a period of mouse inactivity.

To enter/exit full-screen mode, click the Full-Screen button in the View bar (see "View bar" on page 16).

Enter full-screen mode	**Exit full-screen mode**

Locking the Control bar and the Source window popover

By default, the Control bar and the Source window popover behave as follows:

- In full-screen mode, the VS4Recorder Pro Control bar and Source window popover will appear when you move the mouse on the screen, and will disappear after a few seconds of mouse inactivity.

- When not in full-screen mode, the VS4Recorder Pro Control bar is always visible, and only the Source window popover appears and disappears with mouse activity/inactivity.

To lock the Control bar and the Source window popover so that they are always visible in either viewing mode (full-screen or not), go to **Settings** and then select **Lock the source window popover**.

Note   When in Multi-Cam mode or using VS4Control, if dropped or skipped frames are detected during a recording session when in full-screen mode, the Control bar locks automatically to display the Dropped-Frames indicator (see "Record status" on page 26).

Label and filename overlay

For easy identification of sources in the VS4Recorder Pro user interface, you can choose to display the **Label**, **Filename**, or **Both** in each quadrant of the Source window (see "Source window popover" on page 20). The following sections detail how to customize the label and filename overlay.
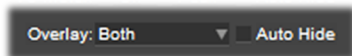
Enabling the overlay

To overlay the source label and/or filename in each of the source windows, select either **Label**, **Filename**, or **Both** from the **Overlay** menu. Select **None** to disable the overlay.

Auto hide

When **Auto hide** is selected, the overlay appears only when mouse activity occurs over the VS4Recorder Pro source windows, and disappears after a period of mouse inactivity.

Keyboard shortcuts

VS4Recorder Pro offers the following keyboard shortcuts:

Keyboard shortcut	Recording	
	Independent mode	Multi-Cam mode
F5	—	Enable Multi-Cam mode
F6	Enable Independent mode	—
CTRL+1	Start recording source 1	Enable source 1 for recording
CTRL+2	Start recording source 2	Enable source 2 for recording
CTRL+3	Start recording source 3	Enable source 3 for recording
CTRL+4	Start recording source 4	Enable source 4 for recording
CTRL+A	Start recording all valid inputs	Enable all sources for recording
CTRL+SHIFT+1	Stop recording source 1	Disable source 1 for recording
CTRL+SHIFT+2	Stop recording source 2	Disable source 2 for recording
CTRL+SHIFT+3	Stop recording source 3	Disable source 3 for recording
CTRL+SHIFT+4	Stop recording source 4	Disable source 4 for recording
CTRL+SHIFT+A	Stop recording all sources	Disable all sources
R	—	Start Multi-Cam session record
CTRL+R	—	Stop Multi-Cam session record
*	Add an event marker	
	Audio Monitoring	
SHIFT+1	Monitor audio from source 1	
SHIFT+2	Monitor audio from source 2	
SHIFT+3	Monitor audio from source 3	
SHIFT+4	Monitor audio from source 4	
ALT+1	Monitor audio channels 1-2	
ALT+2	Monitor audio channels 3-4	
ALT+3	Monitor audio channels 5-6	
ALT+4	Monitor audio channels 7-8	
	View Modes	
Q	Quad-view mode	
1	Source 1 single view	
2	Source 2 single view	
3	Source 3 single view	
4	Source 4 single view	

F	Full-screen mode
ESC	Exit Full-screen mode
	Settings Window
CTRL+S	Open Settings window
CTRL+SHIFT+S	Close Settings window
TAB	Switch between fields in Settings window
	VU Meters
CTRL+V	Show VU meters
CTRL+SHIFT+V	Hide VU meters
CTRL+P	Show audio peaks
CTRL+SHIFT+P	Hide audio peaks
	Label and Filename Overlay
CTRL+L	Show labels only
CTRL+SHIFT+L	Hide labels
CTRL+N	Show filenames only
CTRL+SHIFT+N	Hide filenames
CTRL+B	Show labels and filenames
CTRL+SHIFT+B	Hide labels and filenames
CTRL+O	Lock Source window popover
CNTR+SHIFT+O	Unlock source window popover
	Timecode
CTRL+T	Embed SDI timecode
CTRL+SHIFT+T	Embed VS4Recorder Pro session timecode
CTRL+ALT+T	Embed System Time
	VS4Control
CTRL+C	Enable VS4Contol
CTRL+SHIFT+C	Disable VS4Contol
ALT+M	Set Master
ALT+S	Set Slave
	Miscellaneous
CTRL+M	Minimize the VS4Recorder Pro application
ALT+F4	Close the VS4Recorder Pro application

Keyboard shortcuts

Working with editing applications

You can use the VS4Recorder Pro video and audio files in your favorite editing application for post-event editing. However, VS4Recorder Pro embedded metadata, such as timecode and label, is supported in Adobe Premiere Pro (and other Adobe applications, such as Adobe Bridge) CC and CS6. For more information, see "Viewing VS4Recorder Pro metadata in Adobe Premiere Pro" in this section.

Working with MPEG-2 I-frame *.avi* files on a Windows system requires that the Matrox Video for Windows (VFW) software codecs be installed. The VFW software codecs are automatically installed along with your Matrox VS4 software. If you plan on working with MPEG-2 I-frame *.avi* files on a Windows system without Matrox VS4, MXO2, CompressHD, Mojito MAX, or Mojito 4K hardware, you must download and install the Matrox VFW codecs on that system.

To work with MPEG-2 I-frame *.avi* files on a Mac OS system without Matrox MXO2, CompressHD, or Mojito MAX hardware, you must download and install the MPEG-2 I-frame codec on that system. To download the Matrox VFW software codecs (Windows) or MPEG-2 I-frame codec (Mac OS), visit the Support section of our website at www.matrox.com/video/support.

When using VS4Recorder Pro video and audio files for multi-camera editing, realtime performance is supported only for MPEG-2 I-frame *.avi* files in Adobe Premiere Pro CC and CS6 on a Windows system with Matrox VS4, MXO2, Mojito MAX, or Mojito 4K hardware installed. For more information, see "Multi-camera editing" in this section.

Note MPEG-2 I-frame *.avi* files are not supported in Avid editing applications on Windows systems.

Viewing VS4Recorder Pro metadata in Adobe Premiere Pro

VS4Recorder Pro metadata can be viewed in Adobe applications such as Premiere Pro CC and CS6. The VS4Recorder Pro embeds metadata, such as the timecode, session name and label in every recorded video file. The table below lists the embedded metadata, and shows the associated metadata property in Premiere Pro CC and CS6.

VS4Recorder Pro metadata	Premiere Pro CC and CS6 metadata property (schema)
Start timecode	Time Value (Dynamic Media) Media Start (Premiere Pro Project Metadata)
Label	Label (Basic) Camera Label (Dynamic Media) Nickname (Basic)
Filename	Tape Name (Dynamic Media) Source (Dublin Core)
Field order	Video Field Order (Dynamic Media)
Aspect ratio	Video Pixel Aspect Ratio (Dynamic Media)
Date and time created	Created (Basic) Date Created (Basic)
Frame rate and timecode format	Time Format (Dynamic Media)
Matrox Mtx.utils version	Creator Tool (Basic)

In addition, Adobe Premiere Pro CC and CS6 calculates and offers the following useful metadata information for VS4Recorder Pro video files.

VS4Recorder Pro video file information	Premiere Pro CC and CS6 metadata property (schema)
End timecode	Media End (Premiere Pro Project Metadata)
Duration	Media Duration (Premiere Pro Project Metadata)

The following is the Matrox metadata embedded in the video files captured with VS4Recorder Pro, which can be displayed and used within Premiere Pro, but that can only be viewed through the Matrox metadata list.

Custom Matrox XMP metadata	Description
Computer Name	The name of the computer specified in the VS4Recorder Pro settings dialog
Session Name	The name of the session
Session Creation Date	The date and time that the session started

Working with editing applications

Viewing Matrox XMP metadata in Adobe Premiere Pro

The custom Matrox metadata is displayable in Adobe applications like Premiere Pro CC and CS6. To display the Matrox XMP metadata in Premiere Pro, perform the following steps:

1 In the metadata panel, select **Metadata Display**.

2 Scroll down and select **Matrox**.

An expandable list of Matrox metadata details is now accessible.

Multi-camera editing

When using VS4Recorder Pro video and audio files for multi-camera editing, realtime multi-camera editing of up to four video files is supported only for MPEG-2 I-frame *.avi* files in Adobe Premiere Pro CC and CS6 on a Windows system with Matrox VS4, MXO2, CompressHD, Mojito MAX, or Mojito 4K hardware installed. Multi-camera editing of Matrox *.avi* ofiles in Premiere Pro CC and CS6 using the Matrox Video for Windows (VFW) software codecs on a system without Matrox hardware will not produce realtime results. Multi-camera editing performance with *.mov* and *.mp4* files and MPEG-2 I-frame *.avi* files in other applications depends on your system CPU and storage.

Tip Event markers can be indispensable tools when adding video to a timeline for multi-camera editing with Adobe Premiere Pro CC and CS6 (see "Event markers" on page 29).

5

Using Matrox VS4 with Telestream Wirecast

This chapter describes how to stream and record your video input feeds using Matrox VS4 in Telestream Wirecast.

Overview

You can use Matrox VS4 as an input device to feed live video and audio to Telestream Wirecast for streaming, and simultaneously record all your original video feeds to disk. The easy-to-use Matrox ISO recording tool lets you create high-quality recordings of your feeds, ready for post-event editing in your favorite editing application. The combination of Matrox VS4 and Telestream Wirecast for Windows lets you switch or mix multiple live video feeds and pre-recorded clips while adding graphics and effects. This solution is ideal for Internet broadcasts of sports, religious services, corporate meetings, and other live events. Tight integration of Matrox VS4 using the Wirecast input source SDK ensures the highest level of reliability and stability for your streaming productions. Matrox VS4 automatically detects the presence, resolution, and frame rate of all your inputs. Because all inputs on Matrox VS4 are independent, you can use HD and SD cameras in the same production.

Using Wirecast, you can choose any stereo pair for your streaming production while simultaneously recording all eight channels to disk using the Matrox ISO recording tool. You have complete flexibility to go from a simple stereo mix to surround sound for your post-event editing needs.

You can use up to two Matrox VS4 cards in your system. In a two-card system, all eight VS4 inputs can be used as input devices to feed live video and audio to Telestream Wirecast for streaming. ISO recording is supported on the four inputs of the primary VS4 (see "Selecting your primary VS4 card" on page 93).

Using Matrox VS4 for streaming

Matrox supports a maximum of two VS4 cards per system. With four SDI inputs on each VS4 card, your VS4 system offers up to eight inputs for your live video feeds. This section provides instructions on how to use VS4 as the input device for video and audio in Telestream Wirecast for streaming. For details on how to add shots in Telestream Wirecast, see your Wirecast documentation.

1 Connect your video source(s) to the VS4 SDI input(s) (see "Connecting devices to Matrox VS4" on page 11).

(i) **Important** If connecting sources with different video formats, the sources must have compatible frame rates. For a list of compatible frame rates, see "Supported input formats" on page 10.

2 In Telestream Wirecast, add a new shot for every VS4 input source that you want to stream.

3 For each VS4 shot added in step 2, the corresponding input's audio is automatically selected as the audio source. If desired, you can change a shot's audio source to another VS4 input or to a system audio source as explained in your Wirecast documentation.

Note   For a VS4 input or system audio source to appear in the list of audio sources, a shot must have been added for that VS4 input or system audio source.

4 To configure your video source settings, choose **Sources > Show Sources Settings**.
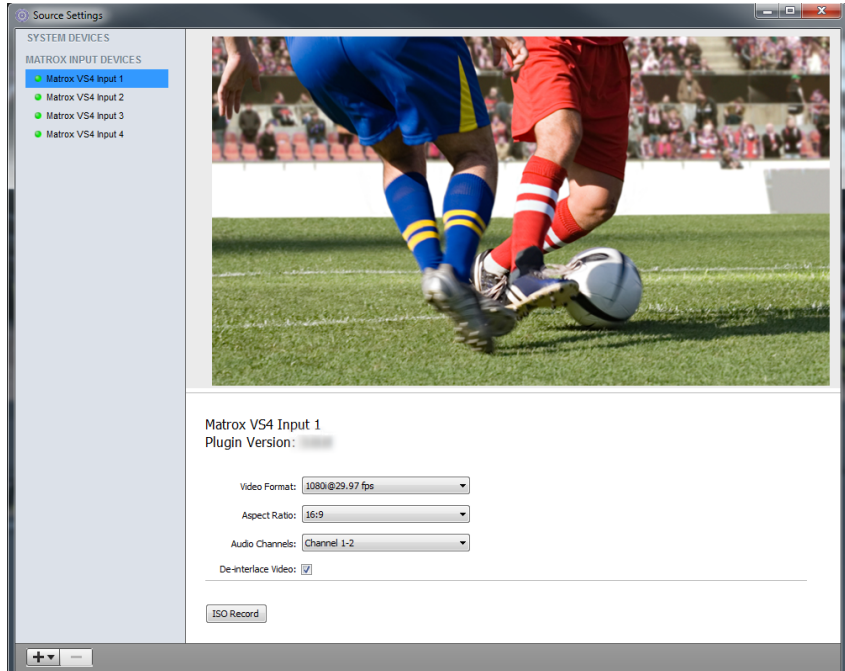
5 In the **Source Settings** dialog box, under **MATROX INPUT DEVICES**, select the Matrox VS4 input that you want to configure for streaming, and then specify the following settings:

– **Video Format**   For interlaced (i) and progressive segmented frame (PsF) sources, select the video format that matches your source video. For progressive (p) sources, Matrox VS4 automatically detects the video format. This setting also applies when recording your source video using the Matrox ISO recording tool (see "Recording your source video to disk" on page 66).

– **Aspect Ratio**   Specify the aspect ratio of your SD source video. For HD sources, this option is automatically set to 16:9. This setting also applies when recording your source video using the Matrox ISO recording tool (see "Recording your source video to disk" on page 66).

Using Matrox VS4 for streaming

– **Audio Channels**   Based on the audio source selected for your shot (see step 3), select the audio pair that you want to stream with your source video. This option does not apply if you selected a system audio source for your VS4 shot. Telestream Wirecast outputs one stereo pair when streaming.

– **De-interlace Video**   If your source video is interlaced (i) and you want to de-interlace your video before encoding, select **De-interlace Video**. This option is used to better display your encoded video on a monitor that displays lines progressively, such as an LCD or computer monitor.

Note   The source settings are automatically saved, and will load automatically when Wirecast opens and when creating a new Wirecast document.

6 If you want to configure another input for streaming, repeat steps 5 and 7 for each input.

7 Set any additional encoding options in Telestream Wirecast as you would normally, and then output your video.

Note   To scale the source video for streaming to another video format, use the scaling options that are available in Telestream Wirecast.

If you want to simultaneously record your original feeds to disk, see "Recording your source video to disk" on page 66.

Recording your source video to disk

Matrox VS4 not only sends your video feeds to Wirecast for streaming (see "Using Matrox VS4 for streaming" on page 64), it can also simultaneously record your original video feeds to disk using the Matrox ISO recording tool. You can, however, record your feeds without streaming.

Note   Up to two VS4 cards are supported per system. In a two-card system, ISO recording is supported on the four inputs of the primary VS4.

You can record your input sources to disk using the available Matrox codecs. You can use the Matrox MPEG-2 I-frame codec to create *.avi* files, and a Matrox DV codec, such as DVCPRO or DVCPRO HD, to create *.mov* files. You can also choose to record up to eight audio channels from any input source as separate mono or stereo *.wav* or *.aac* files. A log file (*Record.Log*) is generated after every recording session, wherein you can view the events for each input recording (see "Record log file" on page 77).

Note   All settings in the Matrox ISO Recording tool are automatically saved.

1 Connect your video source(s) to the VS4 SDI input(s) (see "Connecting devices to Matrox VS4" on page 11).

(i) **Important**   If connecting sources with different video formats, the sources must have compatible frame rates. For a list of compatible frame rates, see "Supported input formats" on page 10.

2 In Telestream Wirecast, choose **Sources > Show Sources Settings**.
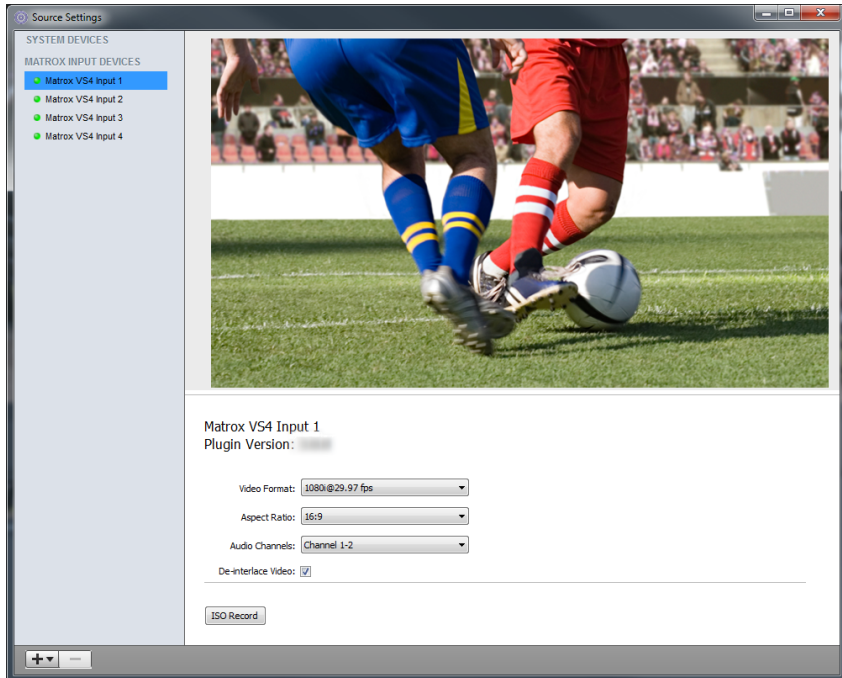
3 Select the Matrox VS4 input that you want to record under **MATROX INPUT DEVICES**.

✎ **Note**   If your system includes two VS4 cards, ISO recording is supported on the four inputs of the primary VS4.

4 For interlaced (i) and progressive segmented frame (PsF) sources, select the video format that matches your source video from the **Video Format** list. For progressive (p) sources, Matrox VS4 automatically detects the video format. This setting also applies when streaming your source video (see "Using Matrox VS4 for streaming" on page 64).

5 If recording an SD source, specify the **Aspect Ratio** of your source video. For HD sources, this option is automatically set to 16:9. This setting also applies when streaming your source video (see "Using Matrox VS4 for streaming" on page 64).

6 If you want to configure another input for recording, repeat steps 3 to 5 for each input.

7 Select any Matrox VS4 input under **MATROX INPUT DEVICES**, and then click **ISO Record** to open the Matrox ISO Recording tool.
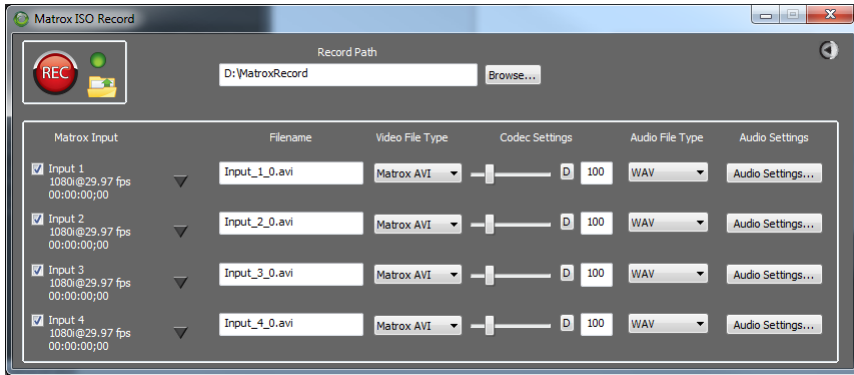
8 Select the settings that you want for recording as explained in "Specifying settings in the Matrox ISO Recording tool" on page 69.

9 Click [REC] to start recording the selected inputs. Click [■] to stop the recording session. You can also start and stop the recording of individual inputs during a recording session (see "Input recording" on page 74).

ⓘ **Important** If the status light turns red when recording, this indicates that one or more of the selected inputs experienced dropped or skipped frames. After the recording session ends, check the *Record.Log* file to see the dropped/skipped events for each recorded input (see "Record log file" on page 77).

10 Click [📂] to open Windows Explorer at the specified **Record Path** location to view the recorded video/audio files, including the record log file (*Record.Log*).

11 Once you've finished recording, you can use the recorded video and audio files in an editing application, such as Adobe Premiere Pro, for post-event editing. For more information, see "Working with editing applications" on page 77.

Specifying settings in the Matrox ISO Recording tool

To specify the settings that you want for recording your clips, select a Matrox input under **MATROX INPUT DEVICES** in the **Source Settings** dialog box, and then click the **ISO Record** button.
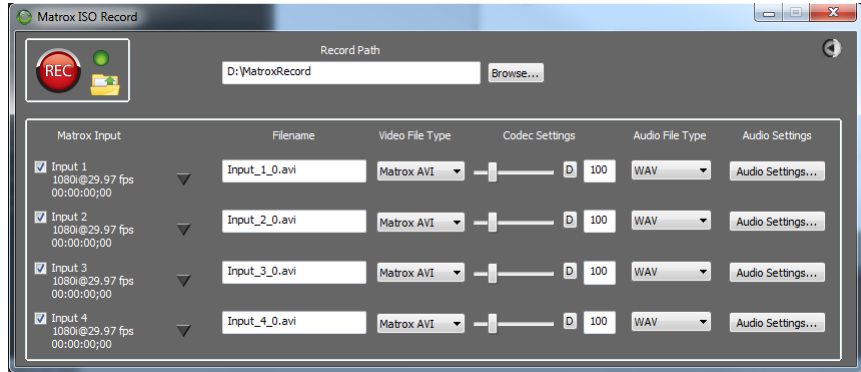
> **Note** You can hide or show the settings in the Matrox ISO Recording tool by clicking ◀ or ▶ respectively.

Record path

Under **Record Path**, specify the destination where all your recorded clips will be stored, or click **Browse** to select the location that you want. Every recording session generates a separate subfolder within the specified location, in the form YYYY-MM-DD HHMMSS, which contains the recorded video and audio files, and the log file (*Record.Log*) for that recording session.

Input selection

Under **Matrox Input**, select the VS4 input(s) that you want to record. You can also select or clear an input during a recording session (see "Input recording" on page 74). If you select an input with no input signal (disconnected) or an invalid input signal, the recorded video will be black with no audio. For more information on the input states and how they affect recording, see "Input states and video formats" on page 76."

Selecting a preset and copying settings

You can load a previously saved record preset to apply record settings to an input, or copy record settings from one input to another using the ▼ button. You can customize any of the settings if needed as explained in the following sections. For more information on these features see "Saving and loading record presets" on page 72 and "Copying and pasting record settings" on page 72.

Filename

In the **Filename** box for each VS4 input, specify the base name for your recorded files. A default base name is provided, but you can change this name if you want. The base name applies to both the video and audio files that are recorded, but the naming conventions for video and audio files differ (see "Matrox VS4 file naming conventions" on page 73").

Video file type selection

Under **Video File Type** for each VS4 input, select one of the following:

- **Matrox AVI**   Creates an MPEG-2 I-frame *.avi* file with embedded stereo PCM (WAV) audio.

📝 **Note**   Matrox MPEG-2 I-frame (*.avi*) files are not supported in Avid editing applications on Windows systems.

- **Matrox MOV**   Creates an *.mov* file in a selected DV format, such as DVCPRO or DVCPRO HD, with embedded stereo or mono PCM (WAV) audio. This option is not available for 1080p @ 24 fps source video.

Audio is embedded in the file only if you choose to record audio with your video (see "Audio settings" on page 71).

Codec settings

Under **Codec Settings**, specify the settings that you want for each VS4 input as follows:

📝 **Note**   When selecting a video codec, make sure that the codec is supported in your editing application. Working with Matrox MPEG-2 I-frame *.avi* files requires a system with the appropriate Matrox codec installed. For details, see "Working with editing applications" on page 77.

- If the **Video File Type** is set to **Matrox AVI**, use the provided slider to select the data rate (in Mb/sec) at which the Matrox MPEG-2 I-frame codec will record your source video to disk. The last setting for an SD or HD source is automatically saved and loaded when an SD or HD source is connected to the input. Click ⬜ᴅ to set the data rate to the default value for an SD or HD input source.

- If the **Video File Type** is set to **Matrox MOV** and your source video is HD, the codec will be set to **Matrox DVCPRO HD**. For SD source video, you can select one of the following codecs for recording your video:
  - **Matrox DV/DVCAM**   Records video to DV or DVCAM format.
  - **Matrox DVCPRO**   Records video to DVCPRO format.
  - **Matrox DVCPRO50**   Records video to DVCPRO50 format.

Audio file type selection

When recording a video input, you can also record the input's audio. If you choose to record audio (see "Audio settings" below), audio will be embedded in the resulting video file. Unless you choose to record embedded audio only, separate *.wav* or *.aac* audio files will also be created.

Under **Audio File Type** for each VS4 input, select the type of separate audio files that you want to create:

- **WAV**   Records PCM audio to separate *.wav* files.
- **AAC**   Records AAC audio to separate *.aac* files.

Audio settings

Click **Audio Settings** for each VS4 input to specify the settings that you want for your recorded audio:
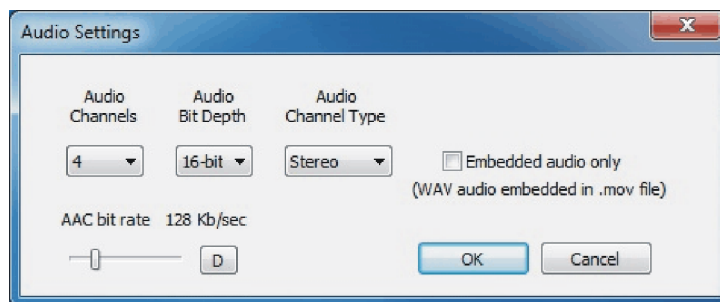
- **Audio Channels**   Specifies the number of channels to record from your VS4 input:
  - When **0** is selected for this option, audio is not recorded. Therefore, audio will not be embedded in the video file, and separate audio files will not be created.
  - When **2**, **4**, **6**, or **8** is selected, the Matrox ISO recording tool embeds the first audio pair (channels 1-2) from your input source in the video file. Unless you choose to record embedded audio only, separate *.wav* or *.aac* audio files will be created for the first two, four, six, or eight audio channels from your audio source respectively.
- **Audio Bit Depth**   If **2**, **4**, **6**, or **8** is selected for **Audio Channels**, select the bit depth that you want for your recorded audio.
- **Audio Channel Type**   If **2**, **4**, **6**, or **8** is selected for **Audio Channels**, select the channel type that you want for your recorded audio:
  - **Mono**   Creates a separate *.wav* or *.aac* audio file for every selected channel. For example, if four audio channels are selected, four mono audio files will be created. The embedded audio in an *.mov* file will also

be mono (not supported for embedded audio in an *.avi* file, which is always stereo).

- **Stereo**   Creates a separate *.wav* or *.aac* audio file for each audio pair selected. For example, if four audio channels are selected, two stereo audio files will be created. The embedded audio in an *.avi*, or *.mov* file will also be stereo.

📝 **Note**   Separate *.wav* audio files can have a maximum file size of 4 GB. See "WAV audio recording" on page 76 for the approximate maximum duration for a separate *.wav* audio file based on the audio settings. This limitation does not apply to separate *.aac* audio files.

- **Embedded audio only**   Select this if you want to embed the first audio pair (channel 1-2) in the video file only. Separate audio files will not be created (the **Audio File Type** will be ignored). If you're recording to an *.avi* file, the **Audio Channel Type** will be set to **Stereo**.

- **AAC bit rate**   For AAC audio, drag the bit rate slider to select the bit rate (in kilobits per second) that you want for your recorded audio. This slider is available for separate *.aac* audio files only.

Saving and loading record presets

In the **Matrox ISO Record** dialog box, once you've specified the Matrox ISO record settings that you want for a VS4 input, you can save your settings as a preset and load the preset at any time to apply those settings to an input with a compatible video format.

- **Save**   To save the current settings of a VS4 input as a custom preset, click ▼ beside the input and choose **Save Preset**. You'll then be prompted to enter a name for your preset. Because the video file type is saved in the preset, you should include the video file type, such as AVI, in your preset name so that you can easily identify your custom presets.

- **Load**   When you load a preset, the video file type, codec settings, audio file type, and audio settings are applied according to the preset. To load a preset for a VS4 input, click ▼ beside the input, choose **Load Preset**, and then select the preset that you want in the displayed dialog box. Only presets that are compatible with your input's video format will be listed.

📝 **Note**   To delete a preset, from the **Load Preset** dialog box, select the preset, and then click 🗑.

Copying and pasting record settings

You can copy and paste the record settings from one VS4 input to another.

- **Copy**   To copy the settings for a VS4 input, click ▼ beside the input and choose **Copy**.

- **Paste**   To paste the copied settings to another VS4 input, click ▼ beside the input and choose **Paste**. The video file type, codec settings, audio file type, and audio settings that are compatible with your VS4 input are applied. Default settings will be applied for any incompatible settings.

Matrox VS4 file naming conventions

The base name specified under **Record Path** in the Matrox ISO Recording tool applies to both the video and audio files that are recorded, but the naming conventions for video and audio files differ as follows:

- **Video files**   Recorded video files contain the base name, VS4 input, and recording number using the following convention:

  basename_input_recordingnumber

  For example, if the base name for Input 1 is *Record*, the resulting file will be named *Record_1_0*. You can also have more than one recording for a given input. In this case, the files are differentiated by a recording number. This occurs when:

  - You clear and then re-select a previously selected input during a recording session. In this case, you will have a different file for each selection sequence. For example, if you're recording Input 1 with the base name *Record*, and you select Input 1 three times during a recording session, the resulting video files will be *Record_1_0*, *Record_1_1*, and *Record_1_2*.

  - You disconnect a source from a selected input during a recording session, and then connect a source with a different video format to the same input. For example, if you're recording an NTSC source connected to Input 1 to an *.avi* file with the base name *Record*, and then you connect a 720p at 59.94 fps source to the same input, the resulting video files will be *Record_1_0*, and *Record_1_1*. If you connect a source with the same video format as the original source, the recording will continue in the original video file (that is, a separate video file will not be created).

- **Audio files**   If you're recording to separate audio files, the audio files are named the same as the video files, except that they also include the audio channel type (mono or stereo) and an incremental suffix using the following convention:

  basename_input_recordingnumber_channeltypesuffix

  For example, if you're recording Input 1 with the base name *Record*, **Audio Channels** is set to **8**, and **Stereo** is selected as the **Audio Channel Type**, the resulting audio files will be named *Record_1_0_Stereo1*, *Record_1_0_Stereo2, Record_1_0_Stereo3, and Record_1_0_Stereo4*. If **Mono** is selected as the **Audio Channel Type** instead of **Stereo**, eight files will be created instead of four, and the files will be named *Record_1_0_Mono1, Record_1_0_Mono2, Record_1_0_Mono3,* and so on.

Record functionality

This section describes the VS4 functionality regarding the recording session, record timecode, and input recording.

Recording session

A recording session begins when you click 🔴 , and ends when you click ⏹ . During a recording session, all selected inputs are recorded. See "Input recording" on page 74 for the input recording methods.

ⓘ **Important**   If the status light turns red when recording, this indicates that one or more of the selected inputs experienced dropped or skipped frames. After the recording session ends, check the *Record.Log* file to see the dropped/skipped events for each recorded input (see "Record log file" on page 77).

Record timecode

Starting a recording session also starts the record timecode for each selected input. Depending on the video input frame rate, Matrox VS4 displays the timecode in either drop frame (HH:MM:SS;FF) or non-drop frame (HH:MM:SS:FF) SMPTE format. Drop frame format is used for NTSC, 23.98 fps, 29.97 fps, and 59.94 fps video, and non-drop frame format is used for all other video frame rates, such as PAL and 25 fps. If you select an input at any time during a recording session, the record timecode for that input starts when you select the input. A recording's timecode stops only when the recording ends for that input file. See "Input recording" on page 74 for information on stopping an input recording.

Input recording

This section describes the various ways of recording an input source, and stopping an input recording:

📝 **Note**   If an input with no input signal (disconnected) or an invalid input signal is selected during a recording session, the recorded video will be black with no audio. Check the *Record.Log* file to see where black frames are recorded (see "Record log file" on page 77).

Recording methods:

- **Selecting an input before starting a recording session**   If an input is selected before starting a recording session, Matrox VS4 creates a recording for that input when the recording session starts. This includes an "invalid input," which refers to an input with no input signal (disconnected) or an invalid input signal. In this case, the video for an "invalid input" will be black and the video format of the recorded file will be the last valid video format detected for that input. When connecting a valid source to an "invalid input" during a recording session, make sure your source's video format matches the format of the "invalid input" to avoid creating a new file. See

"Input states and video formats" on page 76 for information on how to determine the video format of an "invalid input."

- **Selecting an input during a recording session** You can select an input at any time during a recording session to begin recording that input. If you clear and then re-select an input during the same recording session, a separate file will be created for each selection sequence. The files are differentiated by a recording number (see "Matrox VS4 file naming conventions" on page 73).

- **Connecting an input source during a recording session** You can connect an input source to an unselected input during a recording session, and then select the input to record your source feed. If you disconnect the source from a selected input during a recording session, and then connect a source with a different video format to the same input, a new file will be created for that input. The files are differentiated by a recording number (see "Matrox VS4 file naming conventions" on page 73). If you connect a source with the same video format as the original source, a separate video file will not be created and the recording will continue in the original video file.

To stop an input recording:

- **Clear an input during a recording session** Clearing a selected input during a recording session stops the recording for that input. This is done without affecting the recording of other selected inputs.

- **Connect a different video format to a recording input** If you disconnect a selected input's source, and then connect a source with a different video format than the original source, the original recording ends, and a new file is created for the new source. For example, if you're recording an NTSC source connected to Input 1, disconnect the NTSC source and then connect a 720p at 59.94 fps source to the same input, the NTSC recording ends and a new 720p at 59.94 fps recording begins.

- **Stop the recording session** Click 🔴 to stop the recording session. In this case, all input recordings will stop.

WAV audio recording

When you record audio to separate *.wav* files along with your video, the *.wav* files can have a maximum file size of 4 GB. This means that depending on your specified audio settings, the *.wav* audio file has a maximum duration. This restriction does not apply to the embedded audio in the video file, which can last as long as the associated video. The following table lists the approximate maximum duration for a separate *.wav* audio file based on the audio settings:

Audio Channel Type	Audio Bit Depth	Approximate Maximum Duration
Mono	16-bit	12 hours
	24-bit	6 hours
Stereo	16-bit	6 hours
	24-bit	3 hours

Record status

Matrox VS4 includes a record status indicator. If the indicator remains green throughout the entire recording session, all input recordings completed without any dropped or skipped frames. If dropped or skipped frames occur for any input recording, the indicator turns red for the duration of the recording session. Check the *Record.Log* file to see the dropped/skipped events for each recorded input (see).

Record status indicator

Input states and video formats

Matrox VS4 automatically detects the video format of the source connected to a VS4 input and displays it in the Matrox ISO Recording tool.

Input indicator
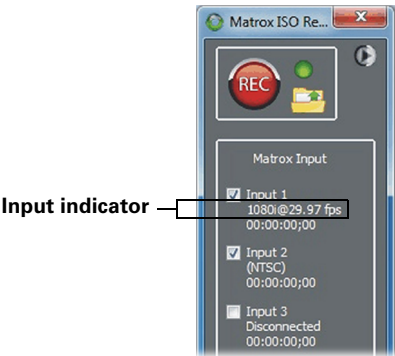
Matrox VS4 displays the following input states:

- **Valid input signal**   If a valid signal is connected to an input, such as 1080i at 29.97 fps, the video format is displayed under the input label. If the input is selected for recording, the resulting video file will be in the displayed video format.

- **No input signal/Invalid input signal**   If VS4 detects no input signal or an invalid input signal for an input, **Disconnected** or **Invalid Input Signal** will be displayed respectively. If the input is selected, the input indicator switches between displaying the state (**Disconnected** or **Invalid Input Signal**) and the last valid video format detected for that input. If you record an input in this state, the resulting video file (black video) will be in the displayed video format. For example, if the input indicator shows **Disconnected** and **NTSC**, the recorded video file will be NTSC. If you connect a valid source to an input in this state when recording the input, make sure the source's video format matches the displayed video format to avoid creating a new file.

Record log file

After every recording session (see "Recording session" on page 74) a record log file (*Record.Log*) is generated. The *Record.Log* file is located in the same folder that contains the files for that recording session. When dropped, skipped, or black frames occur during a recording session, the *Record.Log* file provides a breakdown of events by input, and the timecode of when the events occurred.

Working with editing applications

You can use the recorded video and audio files in your favorite editing application for post-event editing. However, working with Matrox MPEG-2 I-frame *.avi* files on a Windows system requires that the Matrox Video for Windows (VFW) software codecs be installed. The VFW software codecs are automatically installed along with your Matrox VS4 software. If you plan on working with Matrox MPEG-2 I-frame *.avi* files on a Windows system without Matrox VS4, MXO2, CompressHD, Mojito MAX, or Mojito 4K hardware, you must download and install the Matrox VFW codecs on that system.

To work with Matrox MPEG-2 I-frame *.avi* files on a Mac OS system without Matrox MXO2, CompressHD, or Mojito MAX hardware, you must download and install the Matrox MPEG-2 I-frame codec on that system. To download the Matrox VFW software codecs (Windows) or Matrox MPEG-2 I-frame codec (Mac OS), visit the Support section of our website at www.matrox.com/video/support.

When using the recorded video and audio files for multi-camera editing, realtime performance is supported only for Matrox MPEG-2 I-frame *.avi* files in Adobe

Premiere Pro CC and CS6 on a Windows system with Matrox VS4, MXO2, CompressHD, Mojito MAX, or Mojito 4K hardware installed. For more information, see "Multi-camera editing" in this section.

Note Matrox MPEG-2 I-frame *.avi* files are not supported in Avid editing applications on Windows systems.

Multi-camera editing

When using Matrox ISO-recorded video and audio files for multi-camera editing, realtime multi-camera editing of up to four video files is supported only for Matrox MPEG-2 I-frame *.avi* files in Adobe Premiere Pro CC and CS6 on a Windows system with Matrox VS4, MXO2, CompressHD, Mojito MAX, or Mojito 4K hardware installed. Multi-camera editing of Matrox *.avi* files in Premiere Pro CC and CS6 using the Matrox Video for Windows (VFW) software codecs on a system without the specified Matrox hardware will not produce realtime results. Multi-camera editing performance with Matrox *.mov* files and Matrox MPEG-2 I-frame *.avi* files in other applications depends on your system CPU and storage.

6

Using Matrox VS4 with StudioCoast vMix

This chapter describes how to stream and record your video input feeds using Matrox VS4 in StudioCoast vMix.

(i) **Important** When running the Matrox Mtx.utils Setup, remember to select the **Matrox A/V Input DirectShow Filters** option, otherwise you wont be able to use your VS4 with StudioCoast vMix.

Overview

You can use your Matrox VS4 system as an input device to feed live video and audio to StudioCoast vMix for streaming and ISO recording, such as for broadcasting or recording live sports events, concerts, news, educational seminars, and corporate meetings. For example, you can select any video and audio source connected to the VS4 inputs as your A/V sources for use with vMix, and stream your video and audio to a live streaming service.

📝 **Note** You won't be able to use vMix with VS4 if you're currently running another application that uses your VS4 hardware. You must close other applications that use your VS4 hardware before starting vMix.

Setting the recording audio

Before you can use your Matrox VS4 system as an input device in StudioCoast vMix, you must set the recording audio as follows:

1 Start StudioCoast vMix and click the **Settings** button at the top of the main window.

2 In the **Settings** dialog box, click **Audio**.
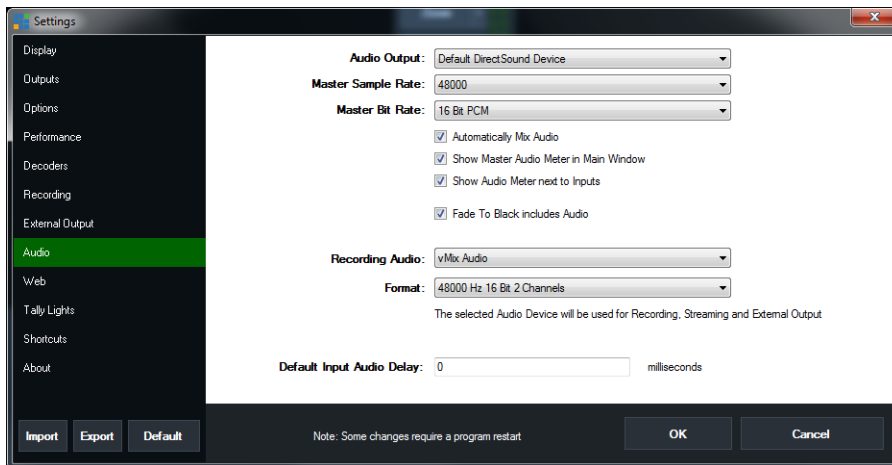
3 From the **Recording Audio** list, select **vMix Audio**.

All the other settings can be left at their default settings.

4 Click **OK**.

Selecting VS4 inputs in vMix

This section provides instructions on how to select the VS4 inputs for video and audio in StudioCoast vMix.

1   Set the recording audio as explained in "Setting the recording audio" on page 80.

2   Connect your video source(s) to the VS4 SDI input(s) as explained in "Connecting devices to Matrox VS4" on page 11.

(i)   **Important**   If connecting sources with different video formats, the sources must have compatible frame rates. For a list of compatible frame rates, see "Supported input formats" on page 10.

3   Start StudioCoast vMix and click the **Add Input** button on the Input Bar at the bottom of the main window.

4   In the **Input Select** dialog box, select **Camera**:
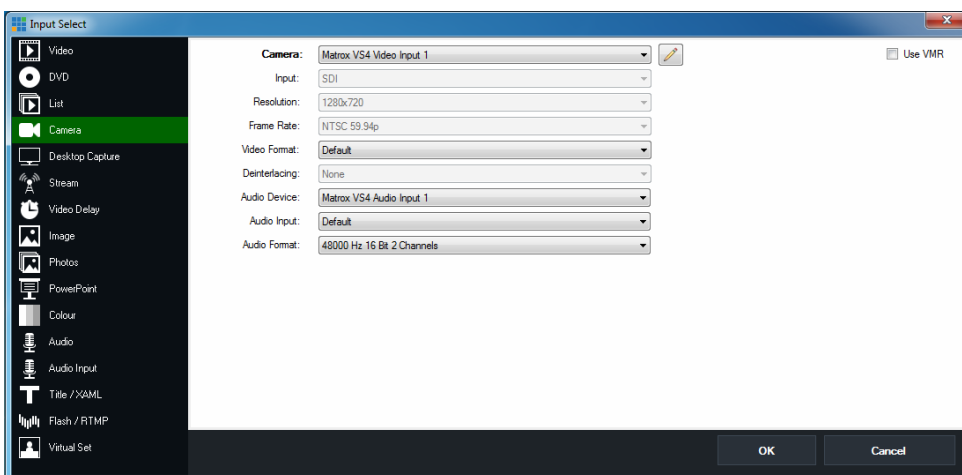
5   From the **Camera** list, select the Matrox VS4 video input that you want to stream or record, such as **Matrox VS4 Video Input 1**.

📝   **Note**   The resolution, frame rate, and input type (SDI) are automatically detected.

6   Under **Audio Device**, select the Matrox VS4 audio input that you want to stream or record, such as **Matrox VS4 Audio Input 1**.

Remarks

–   The audio input does not need to be from the same input as the video. For example, if you selected **Matrox VS4 Video Input 1** from the **Camera** list, you do not need to select **Matrox VS4 Audio Input 1**.

–   Once you select an audio input, you cannot select it again for use with another video input.

7   Under **Audio Input**, select the SDI audio input pair that you want. You can select **Embedded12**, **Embedded34**, **Embedded56**, or **Embedded78**.

📝   **Note**   If you need to change the audio input source after clicking **OK** in the next step, see "Changing the audio input" on page 82.

8   Click **OK** to apply your changes (all other **Camera** settings can be left at their default settings). You should see a preview of your selected video source play back in the **Matrox VS4 Input** preview window. If you don't see your source video, check that your Matrox VS4 hardware and selected video source are properly connected.

9   If you want to add more video inputs, click the **Add Input** button, and repeat steps 4 to 8 for each input that you want to add.

📝   **Note**   You can add up to a total of four video inputs.

Changing the audio input

Once you add an input source in StudioCoast vMix, you cannot change the audio input that was selected for it. If you need to change the audio input that you originally selected, you must remove the video input source and add it again with the audio input that you want as follows:

1   In the Input window, click the **Close** button in the appropriate **Matrox VS4 Input** preview window.

2   Add the video input source again with the audio input that you want as explained in "Selecting VS4 inputs in vMix" on page 81.

Streaming live media with vMix

To stream live media using StudioCoast vMix:

1   Select the VS4 inputs that you want to stream as explained in "Selecting VS4 inputs in vMix" on page 81.

2   Click the **Stream** button on the Input Bar to specify the settings you want for streaming to a live streaming service as explained in your vMix documentation.

Using the vMix MultiCorder feature

You can record up to four VS4 video input sources to Matrox MPEG-2 I-frame *.avi* files using the StudioCoast vMix MultiCorder feature.

1 Select the VS4 inputs that you want to record as explained in .

2 Click the **MultiCorder** button on the Input Bar at the bottom of the main window.

3 In the **MultiCorder** dialog box, select **AVI**. This will be the output format.

4 From the **Codec** list, select the codec that you want to use.

Remarks

– You must select **Matrox MPEG-2 I-frame** if your video inputs are SD, or **Matrox MPEG-2 I-frame HD** if your video inputs are HD.

– To change the settings of your selected Matrox codec, see .

5 Select the inputs that you want to record, and if required, click **Change Recording Folder** to change the location for the output files.

6 Click **Start** to start recording. The duration and number of dropped frames for each input are displayed in the **MultiCorder** dialog box.

7 Click **Stop** when you are finished recording.

For more details on how to use the MultiCorder feature, see your vMix documentation.

Recording the vMix output

You can record the output from vMix to Matrox MPEG-2 I-frame *.avi* files, such as to record video effects that you've applied to your Matrox VS4 video input.

1 Select the VS4 inputs that you want to record as explained in "Selecting VS4 inputs in vMix" on page 81.

2 Click the **Record Setup** button ⚙ ← Record on the Input Bar at the bottom of the main window.

3 In the **Recording Setup** dialog box, select **AVI** on the left.
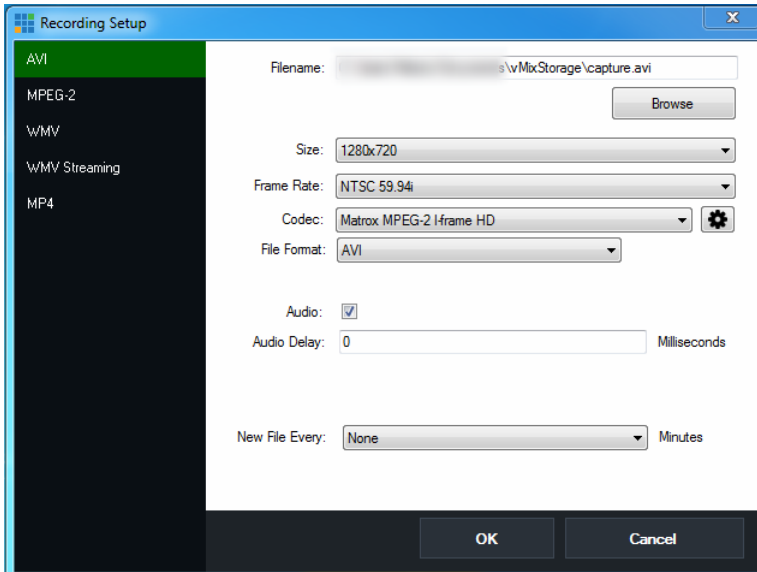
4 In the **Filename** box, specify the location and name for the output file.

5 From the **Size** list, select the frame size for the output file as follows:
  – For MPEG-2 I-frame SD file:
   • 720 × 480 to record to NTSC or 480p format.
   • 720 × 576 to record to PAL or 576p format.
  – For MPEG-2 I-frame HD file:
   • 1280×720 to record to 720p format.
   • 1920×1080 to record to full-size 1080i/p format.

6 From the **Frame Rate** list, select the frame rate that is appropriate for the video format to which you are recording. For example, if you are recording to PAL, set the frame rate to 25 fps.

7 From the **Codec** list, select the codec that you want to use.

Remarks

– You must select **Matrox MPEG-2 I-frame** if your video inputs are SD, or **Matrox MPEG-2 I-frame HD** if your video inputs are HD.

– To change the settings of your selected Matrox codec, see "Selecting your MPEG-2 I-frame settings" on page 85.

8 From the **File Format** list, select **AVI**.

9 Select **Audio** if you want to record the VS4 audio input to your *.avi* file.

10 Click **OK** to apply your changes (all other settings can be left at their default settings).

11 Click the **Start** button on the Input Bar at the bottom of the main window to start recording the vMix output.

12 Click the **Stop** button when you are finished recording.

Selecting your MPEG-2 I-frame settings

When using the Matrox MPEG-2 I-frame or Matrox MPEG-2 I-frame HD codec to record video, you can specify various settings for the MPEG-2 I-frame compression as follows:

1 Click the **Setup** button on the Input Bar at the bottom of the main window.

2 In the **Recording Setup** dialog box, select **AVI** on the left.
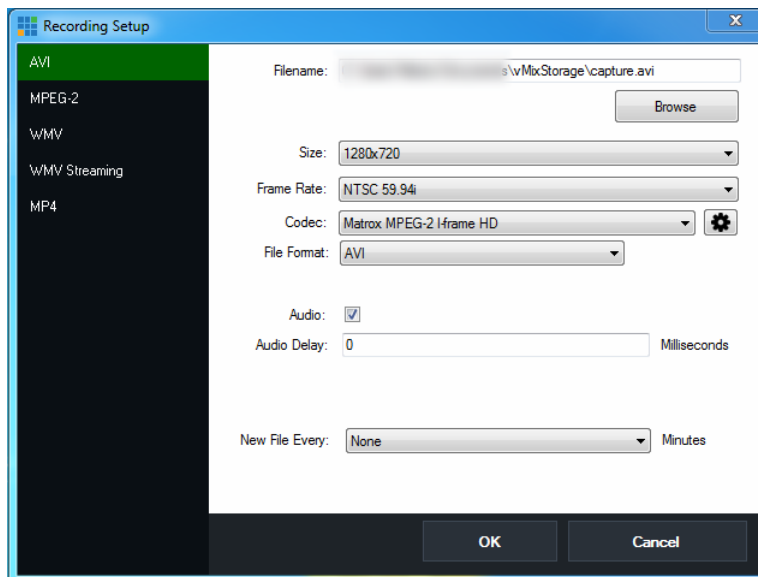
3 From the **Codec** list, select the Matrox codec for which you want to change the settings (either **Matrox MPEG-2 I-frame** or **Matrox MPEG-2 I-frame HD**) and click 🔧.
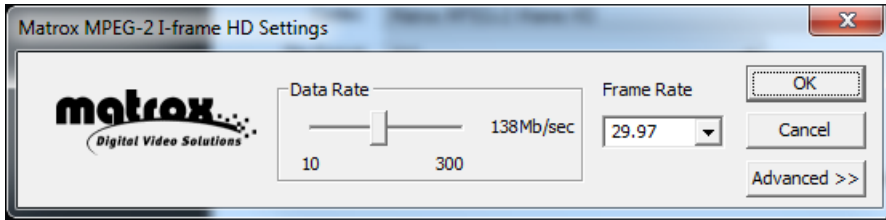
4 Drag the **Data Rate** slider until your desired data rate is displayed. The higher the data rate you select, the better the video quality will be. The range of available data rates depends on whether you're using the Matrox MPEG-2 I-frame HD or SD format.

ⓘ **Important**   Depending on the capabilities of your system, you may drop frames if you select a data rate higher than 125 Mb/sec.

5 To apply advanced settings to your MPEG-2 I-frame file, click the **Advanced** button.

🖊 **Note**   The default advanced settings should provide good results for most applications. We recommend that you change these settings only when needed for special purposes.
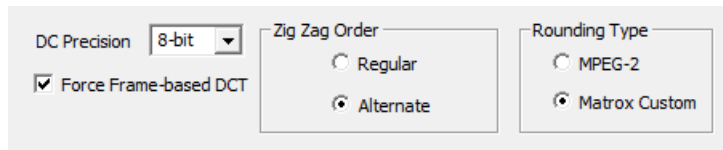
6 From the **DC Precision** list, select the bit-depth precision of the DC intra block.

🖊 **Note**   The higher the DC precision value that's used to record your video, the more likely that the DC content will be increased at the expense of the AC content in the encoded stream. This may result in lowering the overall quality of the compressed stream at a specified data rate.

7 Select the **Force Frame-based DCT** setting to record macroblocks as frames rather than as fields. In some cases, graphics will yield less artifacts if this option is selected.

8   Under **Zig Zag Order**, select one of the following:

– **Regular**   Sets the regular (default) zig zag scanning pattern of the AC coefficient of the DCT block as defined in the ISO/IEC 13818-2 (figure 7-2) specification documentation.

– **Alternate**   Sets an alternate zig zag scanning pattern of the AC coefficient of the DCT block as defined in the ISO/IEC 13818-2 (figure 7-3) specification documentation. Use this setting when recording video at a high data rate (that is, at a data rate of about 50 Mb/sec for SD video, or 100 Mb/sec or higher for HD video).

9   Under **Rounding Type**, select one of the following:

– **MPEG-2**   Rounds the AC coefficients up to the nearest whole number when calculating the quantization coefficient.

– **Matrox Custom**   Truncates the AC coefficients to the lowest whole number when calculating the quantization coefficient. In some cases, this setting may yield less artifacts in graphics.

10   Click **OK** to save your settings.

Your notes

7

Monitoring Your Matrox VS4 System

This chapter explains how to use the Matrox X.info program to display important details about your Matrox VS4 system and installed VS4 cards.

Using X.info to display VS4 information

The Matrox X.info program lets you display information about your Matrox VS4 system and installed VS4 cards, and provides warnings when certain problems arise, such as when the temperature of your VS4 card exceeds the maximum operating temperature.

Note   References to the VS4 card apply to both VS4 and VS4 Pro cards.

Matrox X.info runs continuously to monitor your system, whenever your computer is turned on and the VS4 card is installed. You can open Matrox X.info to display system and hardware details by double-clicking the icon on your Windows taskbar.

Note   If you do not see the icon, check your taskbar properties and make sure that you're showing the icon for Matrox X.info.

Displaying system information

To display information about your Matrox VS4 system, select **System** from the **Display Information About** list. On this page, you can see **Install Information**, such as the install path and version of Matrox Mtx.utils.

You can also create an HTML log file of your system information, which can be useful for troubleshooting. To create this log, use the **Browse** button under **System Information Log** to select the path and name of the log, then click **Create**. If **Open file after scan** is selected, the HTML system log opens after it is created.
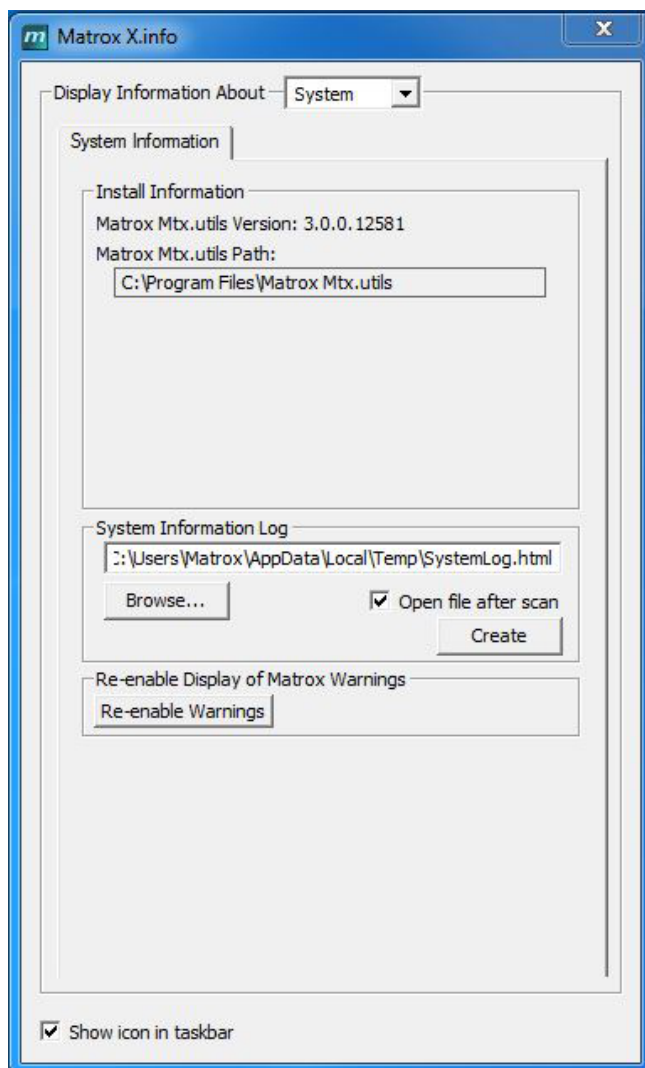
Displaying hardware information

To display information about the Matrox VS4 cards installed in your system, select **Hardware** from the **Display Information About** list. The hardware information (for example, serial number and production date) for each of the installed VS4 cards in your system is displayed on a separate **VS4 Card** page. If you have two VS4 cards installed, use X.info to select which is to be your primary card. You can also monitor the current and maximum operating temperatures for each of your VS4 cards.
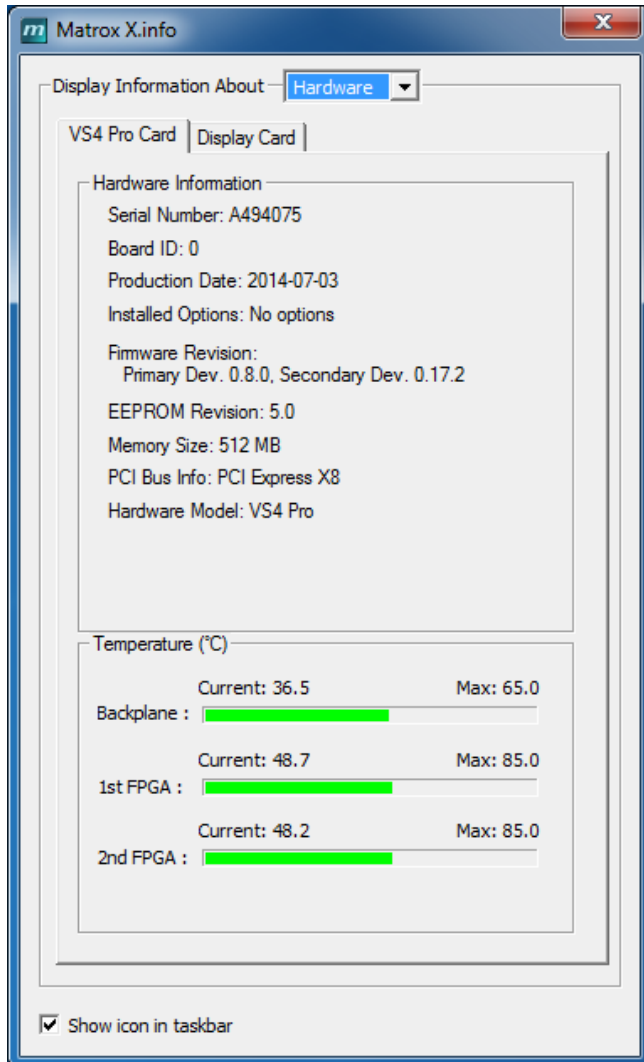
(i) **Important**   Whether or not you have opened Matrox X.info, if your VS4 card exceeds the maximum operating temperature, you'll receive a warning message with further instructions as explained in "Error notification".

Monitoring your VS4's operating temperatures

As shown in the X.info **Hardware** section, the **VS4 Card** page displays the current and maximum operating temperatures for your Matrox VS4 card. To avoid damage to your Matrox VS4 card, make sure that you don't operate your VS4 card at or near the maximum temperature for a prolonged period of time. You should target your VS4 card to operate at least 10°C below the maximum operating temperature.

You should monitor the temperature of your VS4 card periodically and take measures as needed to lower the room temperature and/or improve the ventilation in your VS4 system. If needed, move your VS4 card to a PCIe slot in your computer that is not too close to another card that generates heat, such as a display card.

Selecting your primary VS4 card

If you've installed two VS4 cards, you can use all inputs to feed live video and audio to Telestream Wirecast for streaming and recording (see Chapter 5, "Using Matrox VS4 with Telestream Wirecast"). Other applications used with your VS4 hardware, such as StudioCoast vMix and other editing applications, support only the first four inputs, the inputs of your primary card.

To select your primary VS4 card, click the card's tab and select **Use as primary card/device**. In order for this setting to take effect, you'll need to close all applications that are using your card. When you restart an application that supports only one card, your selected primary will be used with that application.

The option to select a primary card will be available in X.info only when multiple cards are detected. If you don't select a primary, the first card detected in your system will be used as your primary card.

Error notification

X.info provides temperature warnings and warnings for other possible VS4 card problems. Once X.info has detected a hardware problem, the **Matrox X.info Notification** dialog box will be displayed to give you details of the problem and further instructions. You will not be able to close this dialog box until the problem has been resolved.

Your notes

A

Matrox VS4 Specifications

This appendix provides the Matrox VS4 card specifications.

General

- **Supported video input formats**   720×480 at 29.97 fps (NTSC) 4:3, 720×480 at 29.97 fps (NTSC) 16:9, 720×576 at 25 fps (PAL) 4:3, 720×576 at 25 fps (PAL) 16:9, 720p at 50 fps, 720p at 59.94 fps, 1080i at 25 fps, 1080i at 29.97 fps, 1080PsF at 23.98 fps, 1080PsF at 24 fps, 1080PsF at 25 fps, 1080PsF at 29.97 fps, 1080p at 23.98 fps, 1080p at 24 fps, 1080p at 25 fps, 1080p at 29.97 fps, 1080p at 30 fps.

- **Regulatory compliance**
  - FCC Class A, CE Mark Class A, and ACMA Class A
  - RoHS Directive 2002/95/EC

- **Matrox VS4 card**
  - Three-quarter length PCIe (x8) card
  - PCB Dimensions:
    - L 23.2 cm (9.125 in) × W 10.7 cm (4.2 in)
    - Overall thickness including components: 1.9 cm (0.75 in)

- **Typical operating voltages and current consumption**

Voltage	+3.3 V	+12 V
Current	3.0 A	1.3 A

Total power consumption: 23 watts

Connections

- Four HD/SD SDI inputs with eight channels of embedded audio (24-bit, 48 kHz)
  - Compliant with SMPTE 259M, SMPTE 272M, SMPTE 292M, and SMPTE 299M
  - BNC connector (75 Ω), terminated
  - Equalized input for maximum cable-length support

Environmental specifications

- Minimum/maximum ambient operating temperature[*]: 0º to 55º C (32º to 131º F)
- Minimum/maximum storage temperature: –40º to 75º C (-40º to 167º F)
- Maximum altitude for operation: 3,000 meters

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[*] This temperature range assumes that the hardware components on the card don't exceed the maximum operating temperature as explained in "Monitoring your VS4's operating temperatures" on page 93.

- Maximum altitude for transport: 12,000 meters
- Operating humidity: 20% to 80% relative humidity (non-condensing)
- Storage humidity: 5% to 95% relative humidity (non-condensing)

Environmental specifications

Your notes

B

Matrox Customer Support

This appendix explains how you can register your Matrox product and obtain customer support.

How to get Matrox customer support

If you have a problem that you're unable to solve by referring to the documentation for your Matrox product, please contact your Matrox representative. He or she should be able to help you quickly correct any installation or system configuration problem.

If your representative is unable to solve your problem, contact Matrox for further information and assistance.

Registration

You can register your Matrox product in the Matrox Support section of our website at www.matrox.com/video/support.

Only registered users are entitled to customer support, software updates, special promotional offers, and access to our user forum.

Keep up to date with our website

In addition to registering your Matrox product, our website offers you up-to-the-minute information about Matrox products and software updates. Be sure to place our site in your favorites or bookmarks: www.matrox.com/video/support.

Contacting us

Matrox is proud to offer worldwide customer support. Please use the contact information for your Matrox product and area as provided on our website at www.matrox.com/video/support.

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Compliance Statements

USA

FCC Compliance Statement
Remark for the Matrox hardware products supported by this guide
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING
Changes or modifications to this unit not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment. The use of shielded cables for connection of the equipment and other peripherals is required to meet FCC requirements.

Canada

(English) Industry Canada Compliance Statement
CAN ICES-3 (A)/NMB-3 (A)
Remark for the Matrox hardware products supported by this guide
These digital devices do not exceed the Class A limits for radio noise emission from digital devices set out in the Radio Interference Regulation of Industry Canada.

(Français) Conformité avec les exigences de l'Industrie Canada
CAN ICES-3 (A)/NMB-3 (A)
Remarque sur les produits matériels Matrox couverts par ce guide
Ces appareils numériques n'émettent aucun bruit radioélectrique dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada.

Europe

$C\epsilon$

(English) European user's information – Declaration of Conformity
Remark for the Matrox hardware products supported by this guide
These devices comply with EC Directive 2006/95/EC for a Class A digital device. They have been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures. To meet EC requirements, shielded cables must be used to connect the equipment and other peripherals. These products have been tested in a typical Class A compliant host system. It is assumed that these products will also achieve compliance in any Class A compliant system.

(Français) Informations aux utilisateurs Européens – Déclaration de conformité
Remarque sur les produits matériels Matrox couverts par ce guide
Ces unités sont conformes à la directive communautaire 2006/95/EC pour les unités numériques de classe A. Les tests effectués ont prouvé qu'elles sont conformes aux normes EN55022/CISPR22 et EN55024/CISPR24. Le fonctionnement de ces produits dans un environnement résidentiel peut causer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre les mesures appropriées. Pour respecter les impératifs communautaires, les câbles de connexion entre l'équipement et ses périphériques doivent être blindés. Ces produits ont été testés dans un système hôte typique compatible classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible classe A.

(Deutsch) Information für europäische Anwender – Konformitätserklärung
Anmerkung für die Matrox Hardware-Produktunterstützung durch dieses Handbuch
Diese Geräte entsprechen EG Direktive 2006/95/EC für ein digitales Gerät Klasse A. Sie wurden getestet und entsprechen demnach EN55022/CISPR22 und EN55024/CISPR24. In einer Wohnumgebung können diese Produkte Funkinterferenzen erzeugen, und der Benutzer kann genötigt sein, entsprechende Maßnahmen zu ergreifen. Um EG-Anforderungen zu entsprechen, müssen zum Anschließen des ausrüstung und anderer Peripheriegeräte abgeschirmte Kabel verwendet werden. Diese Produkt wurden in einem typischen, der Klasse A entsprechenden, Host-System getestet. Es wird davon ausgegangen, daß diese Produkte auch in jedem Klasse A entsprechenden System entsprechend funktionieren.

(Italiano) Informazioni per gli utenti europei – Dichiarazione di conformità
Nota per i prodotti hardware Matrox supportati da questa guida
Questi dispositivi sono conformi alla direttiva CEE 2006/95/EC relativamente ai dispositivi digitali di Classe A. Sono stati provati e sono risultati conformi alle norme EN55022/CISPR22 e EN55024/CISPR24. In un ambiente domestico, questi prodotti possono causare radiointerferenze, nel qual caso all'utente potrebbe venire richiesto di prendere le misure adeguate. Per soddisfare i requisiti CEE, l'apparecchiatura e le altre periferiche vanno collegati con cavi schermati. Questi prodotti sono stati provati in un tipico sistema host conforme alla Classe A. Inoltre, si dà per scontato che questi prodotti acquisiranno la conformità in qualsiasi sistema conforme alla Classe A.

(Español) Información para usuarios europeos – Declaración de conformidad
Observación referente a los productos de hardware de Matrox apoyados por este manual
Estos dispositivos cumplen con la directiva de la CE 2006/95/EC para dispositivos digitales de Clase A. Dichos dispositivos han sido sometidos a prueba y se ha comprobado que cumplen con las normas EN55022/CISPR22 y EN55024/CISPR24. En entornos residenciales, estos productos pueden causar interferencias en las comunicaciones por radio; en tal caso el usuario deberá adoptar las medidas adecuadas. Para satisfacer las disposiciones de la CE, deberán utilizarse cables apantallados para conectar el equipo y demás periféricos. Estos productos han sido sometidos a prueba en un típico sistema anfitrión que responde a los requisitos de la Clase A. Se supone que estos productos cumplirán también con las normas en cualquier sistema que responda a los requisitos de la Clase A.

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