



Streaming System User's Guide



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Niagara Streaming System User Guide

Information on Safety Instructions, Notice to CATV Installer, Safety Warning, Environmental, Disclaimers, Warranty, Trademarks

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Safety Instructions Rack Mount



Rack Mount Instructions

A) Operating Temperature - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of a rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature of 40° C .

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

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

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

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Notice

Note to CATV Installer: This reminder is provided to call to the CATV installer's attention Section 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.



Warning

Installation of the equipment must comply with local and national electrical codes.

Environmental



<http://www.viewcast.com>

Product Disposal Information: Dispose of this product in accordance with local and national disposal regulations (if any), including those governing the recovery and recycling of waste electrical and electronic equipment (WEEE).

Go to <http://www.viewcast.com> for instructions.

RoHS
COMPLIANT

RoHS Compliant: ViewCast Corporation is committed to compliance with the European directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, Directive 2002/95/EC, the RoHS directive.

From the 1st of July 2006, products that are supplied to the European Union will comply with the RoHS directive. ViewCast certifies that equipment shipped to the European Union conforms to the Directive with exceptions using the Category 3 exemption provided in the Annex of the 2002/95/EC directive.

Disclaimers

ViewCast Corporation makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, ViewCast Corporation reserves the right to revise this publication to make enhancements in the products described in this manual, at any time, without obligation to notify any person or entity of such revisions or changes. In no event will ViewCast Corporation be liable for direct, indirect, special, incidental or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.



Do not attempt to open the case of the encoder. If you do so, there is high risk of electrical shock, which may cause damage to the encoder and/or personal physical injury or death to you and/or others. *No* user-serviceable parts exist inside the encoder. If you open the encoder case and/or make unauthorized changes to the case, the warranty will be voided.

Do not install the encoder near any heat sources such as radiators, heat registers, stoves, and/or other equipment, that produce heat. Attentive concern and exercise of care by installing the encoder away from any heat sources is vital to the safety of the person or persons using the product. Installing the encoder near such heat sources could result in personal injury or death to you and/or others.

Never insert objects of any kind into the encoder through any encoder openings, as the objects may touch dangerous voltage points, short out parts, and result in a risk of fire or electrical shock.

Do not stack the encoder on top of or below other electronic devices as this can cause heat build-up and vibration of the encoder. These conditions can damage the encoder thus voiding the limited warranty.

Do not install the encoder in any area where the temperature is less than 5°C or more than 40°C. Transfer from temperature extremes may cause condensation. Let it sit unplugged at room temperature for at least 45 minutes before plugging it in.

Do not block any ventilation openings to the encoder. Improper ventilation may be hazardous. Blocking ventilation openings could result in overheating of the encoder, which, in turn, may cause fire or electric shock, which may cause damage to the encoder and/or personal physical injury or death to you and/or others. Install the encoder in strict accordance with the manufacturer's instructions, carefully following any and all steps set forth in the instructions in order to avoid physical injury or death to you and/or others.

Do not place the encoder in an enclosure such as a cabinet without proper ventilation.

Fully unplug the encoder during lightning storms, or other dangerous weather that might produce lightning, or when the encoder is unused for long periods of time.

To reduce the risk of fire or electric shock, do *not* expose the encoder to rain or moisture of any kind. Exposing the encoder to rain or other types of moisture could result in impairment to the encoder and physical injury or death to you and/or others.

Encoder shall not be exposed to water or moisture in any way. Liquids in any form should not be placed on or near the encoder. If you place liquids in any form on or near the encoder, do so at your own risk, for there is a high risk of electrical shock that could occur, which may cause damage to the encoder and/or personal physical injury or death to you and/or others.

Refer all servicing to authorized service personnel. Servicing is required when the encoder has been damaged in any way, such as the power supply cord or plug is damaged, liquid has been spilled on the encoder, or objects have fallen into or onto the encoder, the encoder has been exposed to rain and/or other types of moisture, does not operate as described in the User Guide, or has been dropped. This list is nonexclusive. ViewCast assumes no liability or responsibility for any encoder still in use that has been damaged in any way, manner or form.

With the encoder, employ only attachments, accessories and/or any and all other equipment specified by the manufacturer.

Do not use accessories or attachments not recommended by the encoder manufacturer. This will void the Limited Warranty.

Do not in any manner attempt to service the encoder yourself, as opening or removing covers may expose you to dangerous voltage, and will void the Limited Warranty. Refer all servicing to authorized service personnel.

Protect the power cord from being walked on, strained or pinched in any way, particularly at plugs, electrical receptacle, and the point where the power cord exits from the encoder.

Do not use adapter plugs or remove the grounding prong from the power cable.

Operate the encoder using only the type of power source indicated on the marking label on the back panel of the unit. Unplug the encoder power cord by gripping the power plug and removing the plug from the power source. Do not pull the cord to remove the power source from the encoder.

Do not plug the encoder into a wall outlet that contains an overload of electrical cords and, more specifically, power strips, as this type of overload can result in a risk of fire or electrical shock.

When using the encoder, employ an outlet that contains surge suppression and ground fault protection. For added protection during a lightning storm or other dangerous weather, or when the encoder is left unattended and/or unused for long periods of time, unplug the power cord from the wall outlet and disconnect the lines between the encoder and the video source.

Always carefully handle the encoder. Avoid excessive shock and vibration to the encoder at all times, as these conditions can damage the encoder and/or cause personal physical injury or death to you and/or others.

Warranty

The following information is a general warranty overview.

For complete warranty details, please refer to the specific warranty included with each product.

ViewCast warranties are pass through warranties to the end user.

ViewCast warrants all ViewCast software Products to meet their current published specifications as stated in the applicable Software License Agreement or other license document supplied with the Software Product. ViewCast assigns any warranties it may have from any third party suppliers of Products to the Reseller or end user. Any modification voids this warranty or any other existing or available warranties. ViewCast hardware Products are warranted against defects in material and workmanship under normal use for the period of 24 months from date of sale (12 months for GoStream). Where specific warranties exist that provide more substantial coverage, then notwithstanding the warranty provisions herein, such Product warranties shall be controlling and shall preempt or supersede the warranty provisions herein.

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CHAPTER 1 – GETTING TO KNOW THE NIAGARA STREAMING SYSTEM

Introduction

The Niagara[®] Streaming System is a new standard in streaming video encoders, designed from the ground up to provide reliable, pre-configured, plug-and-play solutions. This is a turnkey solution, pre-loaded with all the necessary applications, for users who want to use streaming video without having to configure hardware and software from various vendors.

Organization

Chapter 1 – Getting to Know the Niagara Streaming System – Introduces the Niagara system and its capabilities, including a brief description of video streaming and an explanation of the model numbering system.

Chapter 2 – Setting Up the System – Provides instructions for getting the Niagara system up and running.

Chapter 3 – Operating the Niagara Streaming System – Provides information on getting started with Real Producer[®] and Windows Media[®] Encoder.

Appendix A – Glossary – Provides a quick reference to some frequently used terms and acronyms.

Appendix B – Basic Troubleshooting – Provides a quick reference to basic troubleshooting of the Niagara Streaming System.

Appendix C – Contacting ViewCast Corporation – Provides information on contacting ViewCast support and sales group.

Symbols

This document contains symbols indicating useful information:



Indicates important or supplemental information, references other sections of this document or cites other documents containing related information



Indicates information not to be ignored

Niagara System Features

The ViewCast Niagara family of streaming video encoders have been designed from the ground up to provide reliable, pre-configured, plug-and-play solutions enabling users to broadcast premium quality audio and video over the Internet or corporate enterprise network. Niagara systems are built to our exacting specifications based on ViewCast's years of experience in streaming media.

Niagara systems feature Osprey[®] video capture cards, which provide high-quality, highly reliable video and audio capture for use with streaming applications. They include Osprey SimulStream[®] technology, which allows a single card to support multiple encoding applications. For example, you can capture and encode using both RealNetworks[®] and Microsoft[®] Windows Media simultaneously. This eliminates extra capture cards, reduces the footprint of the encoding system, and eliminates the need for external video/audio distribution amplifiers to split a signal across multiple cards.

Niagara SCX[®] is a feature of Niagara streaming systems. SCX enables control of Niagara streaming encoders from a remote system across the network. Benefits include:

- View multiple encoders at once. See the status of a group of encoders all at one time, even if they are on many different computers scattered across a network, across the country or around the world.
- Set up and control RealNetworks, Microsoft Windows Media, AVI and Flash[®] encoders with one unified interface. Train operators to use just one interface rather than many. Consistent operation reduces operator errors.
- Unclutter the desktop (screen space). One small window does the job of many separate applications - multiple copies of Windows Media Encoder and/or Real Producer. Leaves room to run other applications on your desktop.

- Control encoders from remote machines. Save steps (one room to the next), trips across town or flights around the world.
- Improve security in your data center. Allow qualified users to operate and manager the encoder machines from your Network Operations Center or anywhere on the network.

What Is Streaming Media?

Streaming media is media that is consumed (read, heard, viewed) while it is being delivered. Streaming is more a property of the delivery system than the media itself. The distinction is usually applied to media that is distributed over computer networks; most other delivery systems are either inherently streaming (radio, television, Internet TV) or inherently non-streaming (books, video cassettes, audio CDs).

Niagara Streaming System is designed specifically for streaming audio and video media over an IP network.

Streaming Infrastructure

Before setting up your new Niagara Streaming System, it is useful to understand the complete overview of live streaming video – from video capture to streaming video playback.

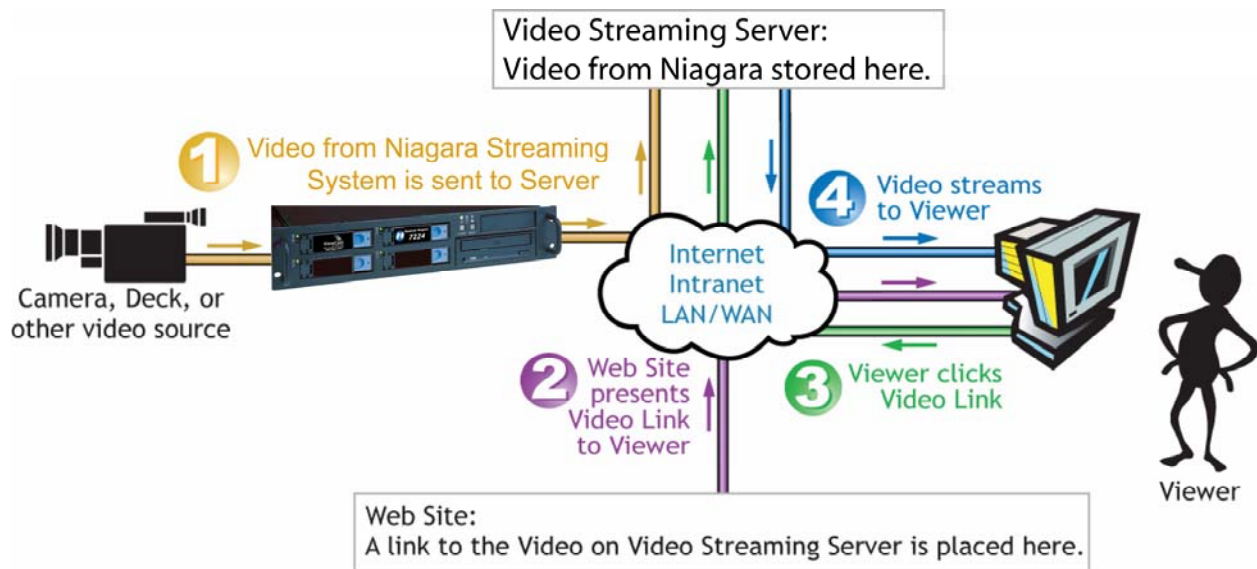
There are many applications for capturing video into the computer environment that can range from DVD authoring to live web casting. Regardless of the final use of the video, all can be categorized into three main workflow processes:

- Single video/session capture (i.e. one-off file capture for non-real time delivery)
 - Typically the captured file is then processed and/or authored into its final form for delivery
- Batch video/session capture (i.e. archiving, scheduling and storage)
 - Multiple source content is to be digitalized
 - Device control is needed for unattended source
 - Ability to schedule sessions is needed to capture timed events
- Live video capture, processing and delivery (web casting)

- Can be single or multiple sources
- Live event at a specific time
- Can be a remote or local capture
- Final content is delivered in real time to viewers

Each category has its unique set of requirements that also dictates different user interfaces, functionality and experiences. The Niagara Streaming System is designed for live video capture, processing and delivery.

Below is a diagram illustrating the video path starting with the source, like a camera or video player, going through the Niagara Streaming System, to the server, across an IP network, to a software player and displayed on a monitor for audience viewing.



Simple Guide to Streaming Audio and Video Types

Niagara Streaming System can create several different types of audio and video streams. Although all are a type of IP video format, each has certain properties that make it more attuned to a specific streaming video application.

The following chart lists streaming formats supported by the Niagara Streaming System with suggested application uses. These formats can be used for many different applications for streaming in full resolution and lower.

Format	Application
Windows Media	Streaming Internet Video and Mobile Devices
RealVideo [®] /Helix [®]	Streaming Internet Video and Mobile Devices

In choosing the right streaming format for your needs, you should first consider the audience to which you will be sending your content. What is the most common player that they will have available to watch your content? This will determine the format of the stream that you will create for your audience.

To determine the data rate that you will stream your content; you will need to determine the IP bandwidth to which your audience has access.

For example, if the access method uses an ISDN connection or less, then you would stream your video and/or audio at a low data rate such as QCIF at 56kbps. If the access is much greater like a cable modem or DSL connection, then you can provide a higher quality stream at full resolution at 2 Mbps.

The Niagara Streaming System provides preconfigured encoding profiles for different bandwidth connections. The profiles loaded will depend upon how you configure your Niagara Streaming System on its initial startup.

CHAPTER 2 – SETTING UP THE SYSTEM

The chapter includes information about initially setting up the Niagara Streaming System:

Mounting Rack Unit Systems in a Rack



When mounting any rack unit system model into a rack, make certain that there is enough room around the system for proper ventilation and cooling.

This section does not apply to Transportable encoder models.

Connecting and Configuring the Network

Please contact your system administrator for information on appropriately configuring the system for use on the network.

Connecting the Audio and Video Source

Niagara systems are configured with selected Osprey cards. Some Niagara systems may have a combination of different cards.

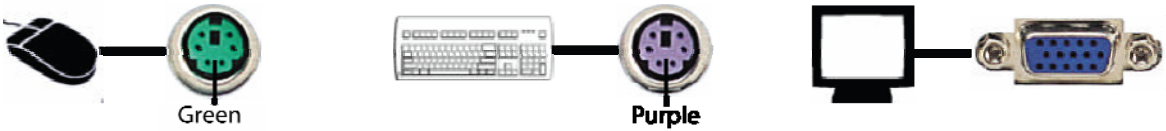
These connections are not specific to a particular Niagara Streaming System. All models contain the same basic connections.

Get Connected

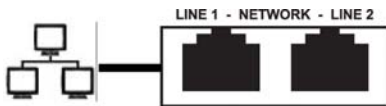
1. Connect the power cable.



2. Connect mouse, keyboard and monitor.



3. Connect a network cable from your IP Network to Network port on the Niagara System.



4. Connect your video and audio source to appropriate inputs on the Niagara System or the breakout panel. If using the breakout panel, ensure that it is connected to the appropriate inputs on the Niagara System.

- a. SDI video input with embedded audio (BNC connector)



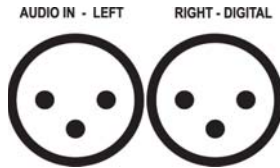
- b. S-video input (mini-DIN connector)



- c. Composite video input (BNC connector or used with included BNC to RCA adapter)



- d. Balanced stereo audio input (XLR left/right connectors)



- e. Unbalanced stereo audio input (RCA left/right connectors or BNC left/right connectors)



- f. AES/EBU Digital audio (XLR right connector)



CHAPTER 3 – OPERATING THE NIAGARA STREAMING SYSTEM

This chapter provides basic information on how to get started encoding video.

Niagara SCX Software Features

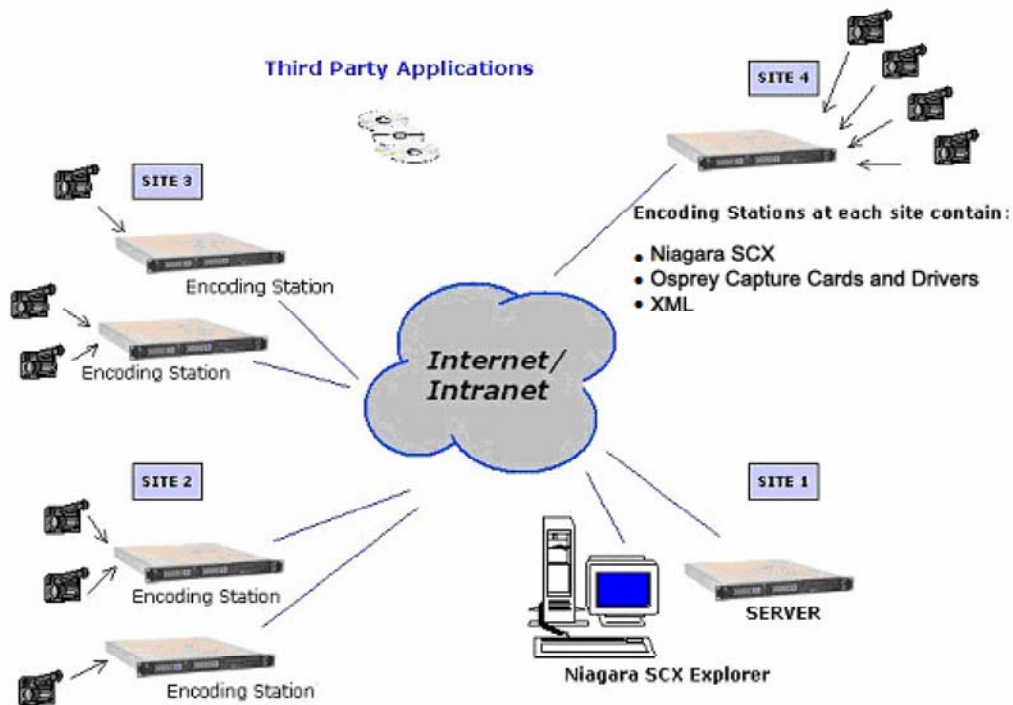
Niagara SCX software is a monitoring and control software package that is included with all Niagara Streaming Systems. It allows monitoring and control of multiple, remote, or distributed streaming encoders throughout an Enterprise or across the Internet.

With SCX, you will have a concurrent view of multiple encoders and the ability to control, create and edit encoding parameters on each system. Full access is provided to start and stop the encoding process, add or modify video and audio input selections, video output resolution and formats as well as monitoring encoder statistics such as frame rate, bit rate, CPU load and audio level.



For more complete information on Niagara SCX, please consult the Niagara SCX Explorer Help file, which can be found in the program menu; ViewCast; Niagara SCX. This Help file is installed with the Niagara SCX Manager or Explorer software.

The following figure illustrates the monitoring and control of multiple, remote or distributed streaming encoders.

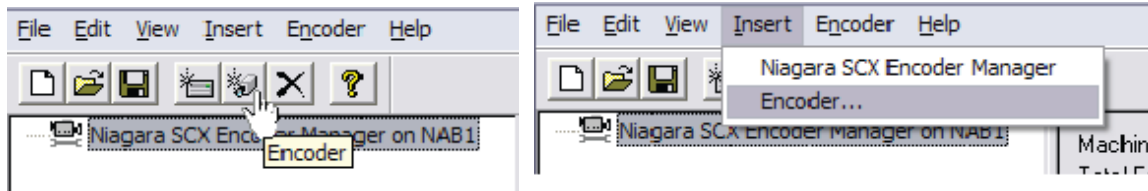


Get Streaming

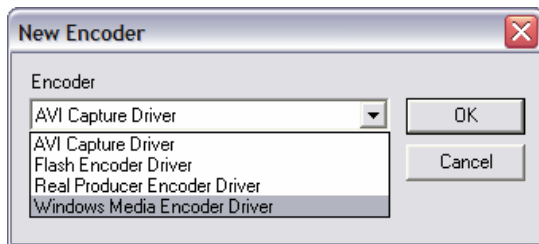
1. Press the Power button on the front panel of the Niagara System.
2. You will need to enter the Microsoft XP key first to register the system. This can be found on the Windows XP Software CD package, or on the sticker on the side of the Niagara Encoder System. (This is necessary for initial setup only.)
3. Start the Niagara SCX Encoder Manager. There is an icon on the system's desktop.



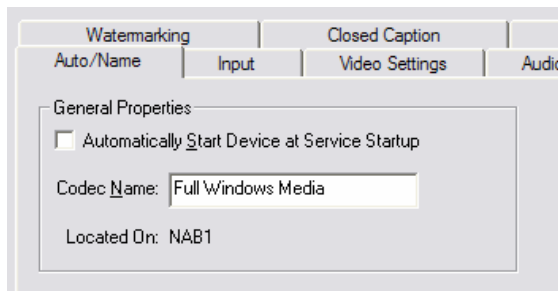
- To add/create an encoder, click on the Encoder button or select Insert from the menu, Encoder.



- In the window, select what type of encoder you would like to create, AVI, Flash, Real Producer or Windows Media.



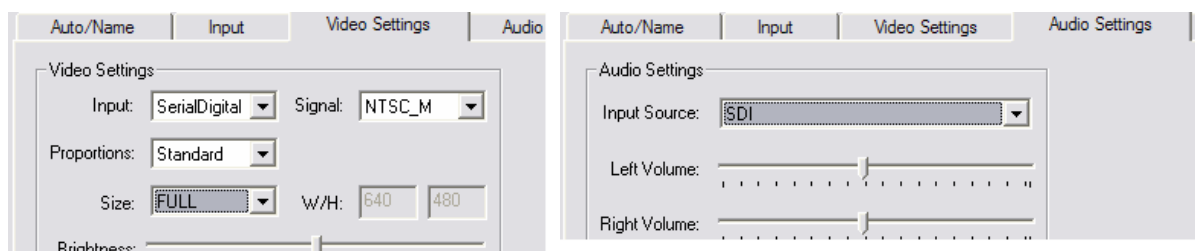
- Enter a name to identify the encoder.



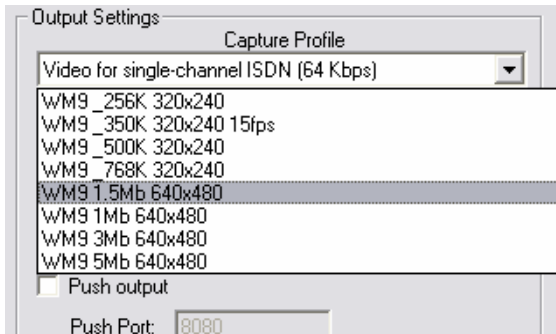
- Select the video and audio input for this encoder on the Input tab.



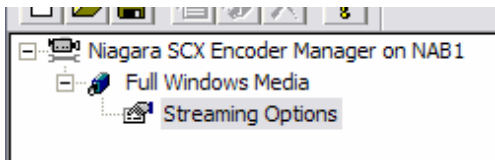
- Configure the video and audio settings on the Video and Audio Settings tabs.



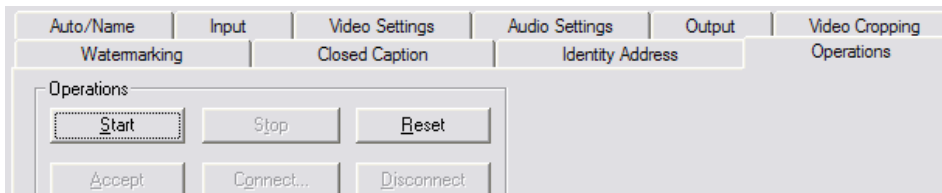
9. Select the output on the Output tab.



10. To view a preview of the video, click the View tab under Streaming Options on the left side of the window (underneath the encoder you are creating).



11. Click Start on the Operations tab to begin encoding.



For more detailed information, refer to the Niagara Streaming Systems User's Guide found on the Niagara CD and the Niagara SCX Explorer Help File found in the start menu, All Programs, ViewCast, Niagara SCX.

Appendix A – Glossary of Terms

4:2:2 Packed Video Format

This mode represents each pixel with a total of 2 bytes (16 bits) of data. The data is encoded as separate data for luminance (intensity) and chrominance (color). These modes are mainly useful as inputs to software compressors.

AVI (Audio Video Interleave)

A Microsoft Windows format for files containing multiple streams of different kinds of data, such as video, audio, and MIDI. Applications built with the Video for Windows Development Kit use the AVI file format.

CCIR601

A video proportioning standard that can be selected on the Osprey AV Stream 4.0 driver video capture RefSize tab. The default standard is Square Pixel. Selecting CCIR601 increases the video size; but Square Pixel is the most commonly used standard.

CIF (Common Intermediate Format)

320x240-pixel windows format for displaying video. See also "QCIF-Quarter Common Intermediate Format."

Codec (Coder/Decoder)

Software or hardware that encodes an analog stream (video or audio) into a compressed digital format and then decodes and decompresses the digital data back into analog data.

Direct Capture

Direct, or uncompressed, capture provides the highest quality image, but takes the most space. A 30-second clip of uncompressed video in 16-bit RGB format, CIF size, uses nearly 150Mbytes of disk space. The images are digitized versions of the input and have no compression artifacts.

Grey8 Video Format

Each pixel has one byte of data, representing one of 256 grayscale levels.

NTSC-M, NTSC-J

The input signal formats used in North America and Japan (NTSC-J). Full-sized NTSC has 525 lines total, 480 lines visible, per frame and a display rate of 60 fields per second, or 30 interlaced frames per sec.

PAL

The input signal formats used in Europe (BDGHI), Brazil (M), Argentina, Paraguay, and Uruguay (PAL-N, NC). Full-sized PAL (other than PAL-M) has 625 lines total, 576 lines visible, per frame and a display rate of 50 fields per second, or 25 interlaced frames per second.

Plausibly Live

Broadcast of a prerecorded event that can be viewed on the client as it is being broadcast. The stream is live, but the content is not.

QCIF (Quarter Common Intermediate Format)

A 160x120 pixel window format for displaying video (one-quarter the resolution of a CIF window).

RGB15 Video Format

Each pixel has two bytes (16 bits) of data. There are 5 bits each of red, green, and blue data; the sixteenth bit is unused. This is a "high color" mode, also known as a "5:5:5."

RGB24 Video Format

Each pixel has three bytes (24 bits) of data - one each for red, green, and blue. This is another "true color" mode with 16.7 million colors, and is a recommended format for capturing images with the highest possible color accuracy.

RGB32 Video Format

Each pixel has four bytes (32 bits) of data - one each for red, green, and blue, plus one byte of padding. The pixel has 256 shades of each of the three colors, for a total of 16.7 million colors. This is a "true color" mode.

SECAM

The input signal format used in France and some other countries. Full-sized SECAM has 625 lines total, 576 lines visible, per frame and a display rate of 50 fields per second, or 25 interlaced frames per second.

Streaming

Transmission of real-time data, commonly audio and video, from a server to a client where the client "plays" content as it is received. This differs from downloaded, cached, or buffered data, which is played after being received in full, or played part by part.

YUV12 Planar Video Format

This is a complex format in which there are 12 bits of data per pixel. Each pixel has 8 bits of luminance data. Each group of 4 adjacent pixels shares two bytes of chrominance data. The luminance, U-chrominance, and V-chrominance data are organized into separate blocks.

YVU9 Planar Video Format

Similar to YUV12 planar, except that there are 9 bits of data per pixel and each byte pair of chrominance data is shared by 16 adjacent pixels.

Appendix B – Basic Troubleshooting

Blue/Green/Magenta Video Screen

The currently selected video input is not receiving an active video signal. Different inputs may provide a different symptom when a video source is not supplied:

- DV inputs will display Magenta (Osprey-540/560 only).
- SDI video may appear black (Osprey-530).
- SDI inputs will display Green.
- Composite and S-video inputs on digital class cards will display black with a green line.
- Composite and S-video inputs on multimedia class cards will display blue.

To solve this problem, check the following:

- Check that the camera, VCR, or other video source is powered and that its output is connected to the Osprey card's input.
- Check that the correct video input is selected in the Control Dialog's Source page.

Black Preview Video Screen

If you select a Color Format other than one of the RGBs or Grey8, you may get a black preview screen. You may also get a message such as "Error: Unable to draw this data format". The problem is that Video for Windows does not know how to decode these more specialized formats. It must be able to locate a software video decompressor on your system that works with this format.

If you encounter this situation with a Color Format that you need or want to use, you have to obtain a suitable compressor.

Scrambled Video Image

You may have set the wrong video signal format for the signal input you are using. For example, you may have told the driver to look for NTSC-M video but are using a PAL-BDGHI video source. Make sure you know what signal format your video source is generating.

Grainy, Dithered Image

Check that you are using a display format with greater than 256 colors. If a 256 color format is used, the system can only approximate the actual colors, and does so with a loss of resolution and precision.

Unwanted Closed Caption Text

Closed Caption text consists of white or colored characters drawn on black character cells.

In video that contains Closed Captioning information, the first active line of video in each field contains encoded Closed Caption text. In video that does not have Closed Captioning information, that line is simply ordinary video.

If you leave Closed Captioning enabled and view non-Closed Caption video, the Osprey video capture driver attempts to interpret the first line of each field of video as Closed Caption character codes. Some video may appear sufficiently similar to Closed Caption data that the software thinks it is Closed Caption text. The result is occasional randomly drawn text appearing on the screen.

The solution is to turn off Closed Captioning when you are viewing sources that are not Closed Captioned. To do so, open the Control Dialog's Closed Caption page and uncheck the **Enable** box in the Display field. The change takes effect when video is restarted after exiting the dialog.

Appendix C – Contacting ViewCast Corporation

Contacting Technical Support

Prior to contacting ViewCast Corporation Technical Support group, contact the Reseller from whom the system was purchased.

ViewCast Corporation
3701 W. Plano Parkway, Suite 300
Plano, Texas USA 75075

+1 972-488-7200 – Main Phone Number
972-488-7157 – Technical Support Phone Number (USA only)
Support@viewcast.com
<http://www.viewcast.com/>

Contacting ViewCast Corporation Sales

ViewCast Corporation
3701 W. Plano Parkway, Suite 300
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