VMC1 OUT™
Operating Instructions
Trademarks: NewTek, NewTek VMC1, NewTek VMC1 IN, NewTek VMC1 OUT, NewTek NC1, NewTek NC1 IN, NewTek NC1 I/O, TriCaster, TriCaster TC1, TriCaster Advanced Edition, TriCaster XD, TriCaster 8000, TriCaster TCXD8000, TCXD8000, TriCaster 860, TriCaster TCXD860, TCXD860, TriCaster 460, TriCaster TCXD460, TCXD460, TriCaster 410, TriCaster TCXD410, TCXD410, TriCaster Mini SDI, TriCaster Mini, TriCaster 40, TriCaster TCXD40, TCXD40, TriCaster 855, TriCaster TCXD855, TCXD855, TriCaster 455, TriCaster TCXD455, TCXD455, TriCaster EXTREME, TriCaster 850 EXTREME, TriCaster TCXD850 EXTREME, TCXD850 EXTREME, TriCaster 450 EXTREME, TriCaster TCXD450 EXTREME, TCXD450 EXTREME, TriCaster 850, TriCaster TCXD850, TCXD850, TriCaster 450, TriCaster TCXD450, TCXD450, TriCaster 300, TriCaster TCXD300, TCXD300, TriCaster PRO, TriCaster STUDIO, TriCaster BROADCAST, TriCaster DUO, MediaDS, MDS1, 3PLAY, 3Play, 3Play 3P1, 3Play 4800, 3PXD4800, 3Play 440, 3PXD440, 3Play Mini, 3Play 820, 3PXD820, 3Play 425, 3PXD425 3Play 330, 3PXD330, TalkShow, TalkShow VS 4000, TalkShow VS100, Network Device Interface, NDI, NewTek Connect, NewTek Connect Spark, NewTek IsoCorder, ProTek, ProTek Care, ProTek Elite, iVGA, SpeedEDIT, IsoCorder, LiveText, LiveGraphics Creator, LiveGraphics, DataLink, LiveSet, LiveGraphics, TriCaster Virtual Set Editor, Virtual Set Editor Advanced Edition, TriCaster VSE, TriCaster VSE Advanced Edition, LiveMatte, TimeWarp, VT, VT[3], VT[4], VT[5], Video Toaster, Toaster, Inspire 3D, 3D Arsenal, Aura, LightWave, LightWave 3D and LightWave CORE are trademarks, service marks, and registered trademarks of NewTek. All other brand names, product names, or trademarks belong to their respective holders.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER 1 INTRODUCTION AND SETUP</th>
<th>........................................................</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1.1 Overview</td>
<td>..................................................................................................................................</td>
<td>3</td>
</tr>
<tr>
<td>Section 1.2 Setting Up</td>
<td>..................................................................................................................................</td>
<td>3</td>
</tr>
<tr>
<td>1.2.1 Command and Control</td>
<td>..................................................................................................................................</td>
<td>3</td>
</tr>
<tr>
<td>Section 1.3 Input Connections</td>
<td>..................................................................................................................................</td>
<td>4</td>
</tr>
<tr>
<td>Section 1.4 Networking</td>
<td>..................................................................................................................................</td>
<td>4</td>
</tr>
<tr>
<td>CHAPTER 2 USER INTERFACE</td>
<td>..................................................................................................................................</td>
<td>5</td>
</tr>
<tr>
<td>Section 2.1 The Desktop</td>
<td>..................................................................................................................................</td>
<td>5</td>
</tr>
<tr>
<td>2.1.1 Configure Channel</td>
<td>..................................................................................................................................</td>
<td>5</td>
</tr>
<tr>
<td>Section 2.2 Titlebar &amp; Dashboard</td>
<td>..................................................................................................................................</td>
<td>14</td>
</tr>
<tr>
<td>2.2.1 Viewport Tools</td>
<td>..................................................................................................................................</td>
<td>14</td>
</tr>
<tr>
<td>2.2.2 Dashboard Tools</td>
<td>..................................................................................................................................</td>
<td>18</td>
</tr>
<tr>
<td>APPENDIX A: NDI (NETWORK DEVICE INTERFACE)</td>
<td>........................................................................</td>
<td>23</td>
</tr>
<tr>
<td>APPENDIX B: DIMENSIONS AND MOUNTING</td>
<td>........................................................................</td>
<td>23</td>
</tr>
<tr>
<td>APPENDIX C: ENHANCED SUPPORT (PROTEK)</td>
<td>........................................................................</td>
<td>24</td>
</tr>
<tr>
<td>APPENDIX D: RELIABILITY TESTING</td>
<td>..................................................................................................................................</td>
<td>24</td>
</tr>
<tr>
<td>CREDITS</td>
<td>..................................................................................................................................</td>
<td>25</td>
</tr>
</tbody>
</table>
Chapter 1  INTRODUCTION AND SETUP

This chapter explains how to connect power, monitors and audio visual devices to your NewTek VMC1 OUT system. It also reviews the registration process. After completing this short section, you'll be all set to begin using VMC1 OUT.

SECTION 1.1  OVERVIEW

Thank you for purchasing this NewTek™ product. As a company, NewTek is extremely proud of its record of innovation and commitments to excellence in design, manufacture, and superb product support. NewTek IP Series products are our most advanced live production systems, and you will find them exceptionally powerful and versatile.

NewTek’s innovative live production systems have repeatedly redefined broadcast workflows, providing new possibilities and economy. In particular, NewTek has been a leader in introducing integrated devices providing a complete set of tools related to program creation and broadcast, along with web streaming and social media publishing. This tradition continues with the NewTek VMC1 OUT. Its implementation of NewTek’s innovative NDI (Network Device Interface) protocol places your new system squarely in the forefront of IP technology solutions for the video broadcast and production industries.

SECTION 1.2  SETTING UP

1.2.1  COMMAND AND CONTROL

Hint: VMC1 OUT’s interface requires a monitor resolution setting of at least 1280x1024.

1. Connect an external computer monitor to either the DVI or HDMI port on the backplate (see Input Connections).
2. Connect the mouse and keyboard to USB ports also on the backplate.
3. Connect the power cord to VMC1 OUT’s backplate.
4. Turn on the computer monitor.
5. Press the Power switch on VMC1 OUT’s faceplate (located behind the drop-down door).

At this point, the blue Power LED will illuminate, as the device boots up. (If this does not happen, check your connections and retry). Though not a requirement, we do strongly recommend that you connect VMC1 OUT using an uninterruptable power supply (UPS), as for any ‘mission critical’ system.

A word about UPS devices:

‘Modified sine wave’ UPS devices are popular due to low manufacturing costs. However, such units should generally be viewed as being of low quality and possibly inadequate to fully protect the system from abnormal power events.

For a modest added cost, consider a "pure sine wave" UPS. These units can be relied on to supply very clean power, eliminating potential problems, and are recommended for applications demanding high reliability.
Likewise, consider A/C “power conditioning”, especially in situations where local power is unreliable or ‘noisy’. Surge protection is especially important in some locales. Power conditioners can reduce wear on VMC1 OUT’s power supplies and other electronics, and provide a further measure of protection from surges, spikes, lightning and high voltage.

SECTION 1.3 INPUT CONNECTIONS

External audio and video devices can be connected to the appropriate connectors on VMC1 OUT’s backplate.

FIGURE 1-1

1. DVI and HDMI monitor connections.
2 a, b. USB Ports – keyboard, mouse and other peripheral devices.
3. Ethernet 1 – motherboard network connection
4. Ethernet 2 – backplane network connection
5. SDI Outputs 1 – 4
6. Phone jack – ¼” stereo connector
7. Analog Audio Out – 2 XLR stereo pairs carry sound from the MIX 1 and MIX 2 outputs
8. A/C Power connectors

SECTION 1.4 NETWORKING

Generally, simply connecting a suitable cable from one or *both of the Ethernet ports on VMC1 OUT's backplate to your local network is all that is required to add it to a local area network (LAN). In some settings, additional steps may be required. You can access the system Network and Sharing control panel to accomplish more extensive configuration tasks. If further help connecting is required, please consult your system administrator.

Note: Dual network connections can be helpful to ease bandwidth limitations when using numerous NDI inputs from your network.
This chapter explains the layout and options of the user interface, and how to configure VMC1 OUT audio and video input and output. It also introduces the various supplemental video production features VMC1 provides, including Proc Amps, Scopes and capture.

SECTION 2.1 THE DESKTOP

The Desktop interface includes dashboards running across the top and the bottom of the screen. By default, the large middle section of the Desktop is divided into quadrants, each displaying one video ‘channel’. Beneath and each channel’s viewport is a toolbar (see Figure 2-1).

Continue reading to get an overview on the features of the VMC1 OUT Desktop.

2.1.1 CONFIGURE CHANNEL

VMC1 OUT allows you to select a different audio and video source for each channel, via the Configure panel (Figure 2-3). The Configure panel can be found by clicking on the gear next to the label for each channel (Figure 2-2).
**Setup Tab**

The **Setup** pane allows you to select the video source for this channel, and set the format. You can choose an NDI or SDI source, webcam, a camera (such as a PTZ unit) with compatible network output, an input from a suitable external A/V capture device, or even a still image (click the *Add Media* icon in the Video Source menu to select a suitable image file).

A **Delay** setting is provided for both audio (under the Audio In tab) and video sources, allowing precise A/V synchronization where source timing differs.

This tab is also where you assign the path and base filename for captured video clips and stills.

Initially the **Record** and **Grab Directories** settings are pointed at the default Videos and Pictures folders on the system, but we strongly encourage you to use fast network storage volumes or an external drive connected to one of the (blue) USB3 ports on VMC1’s rear panel for video capture especially.
**Position**

The **Position** control group includes **Position, Zoom, and Rotation**. **Position** settings can be toggled on and off together using the switch provided. Click and drag on the **Position** button to relocate the associated **channel** vertically or horizontally within the frame. Dragging left or right directly on either of the nearby numeric controls adjusts the position on a single axis (you can also handle negative and positive values here, otherwise not possible).

*Hint: You can constrain mouse actions to one axis by holding down the Ctrl key before dragging.*

Dragging the cursor on the **Zoom** button (magnifying glass) affects the apparent size of the video in the channel. Again, if you drag just one of the associated numeric gadgets you can adjust just one dimension of the corresponding video layer – width or height.

In similar fashion, drag the pointer over the **Rotation** button with the left mouse button depressed to turn the video source on three axes as follows:

- Drag left/right to rotate the source about the Y (vertical) axis.
- Drag up/down to rotate the source about the X (horizontal) axis.
- Drag while holding **Ctrl** down to rotate about the Z axis.
- Drag on a single numeric slider, or hold down **Ctrl** to constrain rotation to one axis.

**Edges**

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chromakeying is applied, but which need to be removed along with the background. (Common examples include microphones or lighting fixtures dangling from above, or perhaps a harsh crease, blemish or tear in the background screen.) Or, as is frequently the case, the source video itself may have a few pixels of black or video ‘noise’ along one or more of its edges.

Cropping settings in the **Edges** control group can be used to remove such unwanted ‘garbage’ from the scene, or used independently for other purposes – such as to isolate some portion of the screen for use as a ‘Picture in Picture’ overlay source.

Essentially, the numeric controls in this group allow you to define independent margins for the frame. Drag left or right on the number fields to adjust the values interactively, or double-click a field to type a value using the keyboard. The region defined by these controls will be completely cropped.

**NDI Output**

In addition to SDI output, the a/v signal from each channel is also added to your network as an **NDI** source.

*Note: NDI Group Manager, included in NDI Tools (available without charge from NDI.newtek.com), can be used to control access to NDI source and output streams.*
**IP SOURCES**

**FIGURE 2-4**

As mentioned in the previous section an IP (network) source such as a PTZ camera with compatible network video output can be selected. The *Video Source* drop down menu contains an IP icon (Figure 2-4).

**FIGURE 2-5**

Clicking the *IP icon* opens the *IP Source Manager*. Adding entries to the list of sources shown in this panel causes corresponding icons for new sources to appear in the *Local* group shown in the *Video Source* menu of the *Configure Channel* panel (Figure 2-3).
To begin. Click the *Add New Camera* menu, and select a source type from the dropdown list provided.

Doing so opens a dialog suited to the particular source device you wish to add, such as one of the numerous supported PTZ camera brands and models.

*FIGURE 2-6*

![Configure Panasonic PTZ Camera](image)

*FIGURE 2-7*

**Note:** After adding an IP source, you must exit and restart the software for the settings to be applied.

**Audio In Tab**

The second tab in the *Configure Channel* pane hosts settings related to audio input for the current channel. The Audio Source will default to “Follow Video Source” but can be changed from the drop down menu. A delay can be set to the audio from this panel as well.
In addition you have the ability to adjust audio channel levels using the sliders and VU meters.

*Double clicking the slider will reset it to 0.0db.*
**Equalizer**

The seven-band equalizer allows you to ‘shape’ sound to taste, accommodate sources with different acoustic characteristics (say, mismatched mics), minimize feedback or roll off unwanted parts of the audio spectrum.

Enable or disable the *Equalizer* using the switch beside the label above its control group. The vertical sliders attenuate or boost the tonal range centered on the frequency shown at the top.

The effect applied falls off gradually as sound draws closer to neighboring frequencies on either side. Click *Reset* to return all sliders to 0dB.

**Compressor Limiter**

The *Compressor/Limiter* is capable of preventing clipping (see Section *Error! Reference source not found.*) from unexpected peaks or transients, and making talent sound better than they do in real life, bringing voices, music and other audio sources into an optimal dynamic range. Being able to do this independently for each output too is icing on the cake, especially for Internet streaming, as it ensures correct levels at any time.

**Threshold**

Sound above the set *Threshold* level will be compressed; the amount of compression and the manner in which it is applied are both dictated by the other settings.
A **Ratio** of 4:1 means that if input level is 4 dB over the threshold, the output signal level after compression will be just 1 dB over the threshold. The gain (level) is reduced by 3dB. Very high ratio settings are the reason the word “limiter” is part of the title for this feature. The highest ratio setting will effectively reduce any signal that would rise above the threshold all the way down to the threshold level (with the exception of a brief period during a sudden increase in source loudness, as dictated by the **Attack** setting).

**Attack**

**Attack** (like Release) is labeled in milliseconds. The setting represents the amount of time it takes for the gain to change by a specified amount.

It would not be grossly incorrect to think of this setting as changing the slope of a graph depicting how aggressively the compressor pursues the target value (defined by applying the **Ratio** setting to the amount the signal surpasses the **Threshold**). Shorter values are more aggressive, while longer values are more subtle (and tend to be less noticeable to the audience).

**Release**

**Release** is similar to **Attack** in many ways, but refers instead to the speed with which the compression effect is removed as a source signal falls back on its own so that it no longer exceeds the **Threshold**.

**Gain**

Naturally, compression impacts the overall output level of the source or output. The **Gain** control allows you to compensate, bringing the post-compressor/limiter signal back to a comfortable nominal range.

**Audio Routing**

At times you may require specially configured audio mixes. For instance – some installations call for sending audio from one or more internal sources to a secondary distribution system.

Alternatively, you may want a ‘clean’ output from one or more sources for use apart from the main primary output mix. Specialized sub-mixes of this sort are often referred to as ‘mix-minus,’ since one or more sources are deliberately subtracted from the main program.

Then again, the designated audio source for a channel may carry narration in different languages on different audio channels. Since the routing matrix panel lets you remap inputs channel to the various output channels available, you can move Swahili to the first two channels on one output, while another otherwise identical output carries Dutch on the same channels.
The **Color** tab provides an extensive set of tools for adjusting the color characteristics of each video channel.

Choosing **Auto Color** automatically adapts color balance as lighting conditions change over time.

*Note: Proc Amp adjustments follow Auto Color processing.*

By default each camera with **Auto Color** enabled is processed by itself. Enable **Multicam** to process multiple cameras as a group.

To apply **Multicam** processing to a source without its own colors being evaluated, checkmark **Listen Only**. Or enable **Listen Only** for all **Multicam** group members except one to make that source the ‘master’ color reference.

*Note: Custom settings in the Color tab trigger a COLOR notification message that appears in the footer below the viewport of the channel (Figure 2-10).*
SECTION 2.2 TITLEBAR & DASHBOARD

VMC1 OUT’s Titlebar and Dashboard are home to a number of important displays, tools and controls. Prominently located at the top and bottom of the Desktop, the Dashboard occupies the full width of the screen.

The various elements comprising the Dashboard are listed below (starting from the left):

1. Machine name
2. Time Display and System Configuration (see section 0)
3. Information - Links to online resources and system information.
4. Headphones Audio source (see Audio (Headphones))
5. Volume
6. Record (see Record)
7. Display (see Monitoring)

Of these items, some are so important that they rate their own chapters. Others are detailed in various sections of this guide (cross references to the relevant sections of the manual are provided above).

2.2.1 VIEWPORT TOOLS

The VMC1 OUT’s channels each have a toolbar; the various elements that make up the toolbar are listed below from left to right:

1. Channel name - can be changed by clicking on the label. This can also be changed in the Configuration panel (see Error! Reference source not found.).
2. Configuration gear (see section 2.1.1)
3. *Record button* and *Record Time Display* – the record button functions as a toggle for recording one particular channel (the RECORD button in the bottom dashboard which opens a widget for selecting single, group or all channels).

4. *DSK* – (downstream key) toggle

5. *DSK configuration* (gear)

6. *Grab still* – base name and save path can be set in the *Configuration* panel (see Error! Reference source not found.)

7. *Full screen* (see Fullscreen)

8. *Overlays* (see Overlays)

---

**DSK**

![DSK Tool](image)

**FIGURE 2-12**

The *DSK* tool is found in the lower right corner of each channel. For key/fill source configurations, assign the Alpha Matte source to the neighboring even-numbered channel, and enable the *Alpha Matte* button in the lower right corner below the monitor for each channel (see Figure 2-12).
**Input Settings**

**FIGURE 2-13**

The *Source* control allows you to select a still image or animations to use as an overlay. Enabling *Loop* allows animations to repeat endlessly, this is ideal for station ID ‘bugs’. *Overlay Audio* can be enabled or disabled from this panel, the default is off. The *Level* slider allows you to control sound volume from the overlay source, when present.

The *Position* control group include *Position*, *Zoom*, and *Rotation*. *Position settings* can be toggled on and off together using the switch provided. Click and drag on the *Position* button to relocate the associated DSK layer vertically or horizontally within the frame. Dragging left or right directly on either of the nearby numeric controls adjusts the position on a single axis (you can also handle negative and positive values here, otherwise not possible).

**Hint: You can constrain mouse actions to one axis by holding down the Ctrl key before dragging.**

Dragging the cursor on the *Zoom* button (magnifying glass) affects the apparent size of the overlay. Again, if you drag just one of the associated numeric gadgets you can adjust just one dimension of the corresponding DSK layer – width or height.

In similar fashion, drag the pointer over the *Rotation* button with the left mouse button depressed to turn the overlay source on three axes as follows:

- Drag left/right to rotate the source about the Y (vertical) axis.
- Drag up/down to rotate the source about the X (horizontal) axis.
- Drag while holding *Ctrl* down to rotate about the Z axis.
Livematte

The Livematte tab is where the realtime keying system is configured. Keying is a popular and powerful method of compositing multiple images, whether photos, video clips or live camera streams.

**FIGURE 2-14**

The process involves eliminating a portion of the image (effectively cutting a digital ‘keyhole’ in it) to reveal a user-defined background scene. *Livematte*’s controls are deceptively simple, making a great deal of complex digital manipulations easy to use. Even so, much can be said about getting the best results.

**Edges**

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chroma-keying is applied, but which need to be removed along with the background. (Common examples include microphones or lighting fixtures dangling from above, or perhaps a harsh crease, blemish or tear in the background screen.) Or, as is frequently the case, the source video itself may have a few pixels of black or video ‘noise’ along one or more of its edges.

Cropping settings in the *Edges* control group can be used to remove such unwanted ‘garbage’ from the scene, or used independently for other purposes – such as to isolate some portion of the screen for use as a ‘Picture in Picture’ overlay source.

Essentially, the numeric controls in this group allow you to define independent margins for the frame. Drag left or right on the number fields to adjust the values interactively, or double-click a field to type a value using the keyboard. The region defined by these controls will be completely cropped.
A *Grab Input* tool is located in the lower right corner below the monitor for each channel. By default, still image files are stored in the system “Pictures” folder. The path can be modified in the *Output* window for the channel (see *Error! Reference source not found.*).

Clicking this button will expand the video in the selected channel to fill your monitor. Pressing ESC on your keyboard will return the display to normal.

Found in the lower right corner of each channel, *Overlays* offer useful tools for visualizing safe zones, centering and more. To use an overlay, click on the icon in the list (Figure 2-19). More than one overlay can be active at the same time.
Located in the bottom right corner of the dashboard, the Display widget contains a variety of layout options for viewing channels individually or in groups, on one or two monitors (Figure 2-19).

Among the layout options a Waveform and Vectorscope (Scopes) can also be found here in the Display widget (Figure 2-20).
The Record button can be found in the lower right corner of the dashboard (see Figure 2-21). When pressed it will open a widget allowing you to select which specific channel(s) to begin or stop recording. You can even choose to start or stop all recordings.

Note: The destination of the recorded channels, labels, base file names and other settings are controlled from the Configuration panel (see Figure 2-3).

LTC timecode support can be activated in the System Configuration panel located in the gear found in the upper right corner of top dashboard.
You can connect a headset to the (green) audio output jack on the rear of VMC1 OUT’s motherboard.

1. The Headphone Audio controls and icon can be found in the lower left of the bottom dashboard (Figure 2-23).

2. Headphone Source can be set by opening the menu next to the headphone icon (see Figure 2-11).

3. The Headphone Volume for the selected source can be adjusted moving the head of the slider, this can be set back to 0dB by double clicking on the headphone audio head.
APPENDIX A: NDI (NETWORK DEVICE INTERFACE)

For some, the first question may be “What is NDI?” In a nutshell, NewTek’s Network Device Interface (NDI) technology is a new open standard for live production IP workflows over Ethernet networks. NDI allows systems and devices to identify and communicate with each other, and to encode, transmit, and receive high quality, low latency, frame-accurate video and audio over IP in real time.

NDI enabled-devices and software have the potential to greatly enhance your video production pipeline, by making video input and output available anywhere your network runs. NewTek’s live video production systems and a growing number of third party systems provide direct support for NDI, both for ingest and output – but, at times, you may want to connect a source that is not natively NDI-enabled; or you may wish to supply an NDI output to a traditional downstream device or display. NDI Connect provides the means to handle i/o requirements of this type and more.

For more extensive details on NDI, please visit http://www.newtek.com/ndi.html.

APPENDIX B: DIMENSIONS AND MOUNTING

The NewTek VMC1 OUT comprises a 1 Rack Unit (RU) enclosure supplied with ‘ears’ designed to permit mounting in standard 19” rack architecture (Figure 2-25).

The units weigh nearly 14 pounds (6.35 KG). A shelf or rear support will distribute the load more evenly if rack-mounted. Good front and rear access is important for convenience in cabling should be considered. In view of the top panel vents on the chassis, at least one RU should be allowed above these systems for ventilation and cooling.
**APPENDIX C: ENHANCED SUPPORT (PROTEK)**

NewTek’s optional ProTek℠ service programs offer renewable (and transferable) coverage and enhanced support service features extending well beyond the standard warranty period.

Please see http://www.newtek.com/protek.html or your local authorized NewTek reseller for more details regarding ProTek plan options.

**APPENDIX D: RELIABILITY TESTING**

We know our products play vital roles in the productions of our customers. Durability and consistent, robust performance are much more than just adjectives for your business and ours.

For this reason, all NewTek products undergo rigorous reliability testing to ensure they meet our exacting test standards. For VMC1 OUT, the following standards are applicable:

<table>
<thead>
<tr>
<th>Test Parameter</th>
<th>Evaluation Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Mil-Std-810F Part 2, Sections 501 &amp; 502</td>
</tr>
<tr>
<td>Ambient Operating</td>
<td>0°C and +40°C</td>
</tr>
<tr>
<td>Ambient Non-Operating</td>
<td>-10°C and +55°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>Mil-STD 810, IEC 60068-2-38</td>
</tr>
<tr>
<td>Ambient Operating</td>
<td>20% to 90%</td>
</tr>
<tr>
<td>Ambient Non-Operating</td>
<td>20% to 95%</td>
</tr>
<tr>
<td>Vibration</td>
<td>ASTM D3580-95; Mil-STD 810</td>
</tr>
<tr>
<td>Sinusoidal</td>
<td>Exceeds ASTM D3580-95 Paragraph 10.4: 3 Hz to 500 Hz</td>
</tr>
<tr>
<td>Random</td>
<td>Mil-Std 810F Part 2.2.2, 60 minutes each axis, Section 514.5 C-VII</td>
</tr>
<tr>
<td>Electrostatic Discharge</td>
<td>IEC 61000-4-2</td>
</tr>
<tr>
<td>Air Discharge</td>
<td>12K Volts</td>
</tr>
<tr>
<td>Contact</td>
<td>8K Volts</td>
</tr>
</tbody>
</table>
Acknowledgments: Tim Jenison, Jim Plant


With special recognition to: 3D Storm, DVS Direct, Lanlink Digital Broadcast

This product uses the following libraries, licensed under the LGPL license (see link below). For the source, and the ability to change and recompile these components, please visit the links provided:

- Freelimage library http://freeimage.sourceforge.net/
- LAME library http://lame.sourceforge.net/
- FFMPEG library http://ffmpeg.org/

For a copy of the LGPL licence, please look in the folder c:\TriCaster\LGPL\Portions use Microsoft Windows Media Technologies. Copyright (c)1999-2008 Microsoft Corporation. All Rights reserved.

This product uses Inno Setup. Copyright (C) 1997-2010 Jordan Russell. All rights reserved. Portions Copyright (C) 2000-2010 Martijn Laan. All rights reserved. Inno Setup is provided subject to its license, which can be found at:

http://www.jrsoftware.org/files/is/license.txt. Inno Setup is distributed WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY of FITNESS FOR A PARTICULAR PURPOSE.

Trademarks: NewTek, NewTek VMC1, NewTek VMC1 IN, NewTek VMC1 OUT, NewTek NC1, NewTek NC1 IN, NewTek NC1 I/O, TriCaster, TriCaster TC1, TriCaster Advanced Edition, TriCaster XD, TriCaster 8000, TriCaster TCX8000, TCX8000, TriCaster 860, TriCaster TCX860, TCX860, TriCaster 460, TriCaster TCX460, TCX460, TriCaster 410, TriCaster TCX410, TCX410, TriCaster Mini SDI, TriCaster Mini, TriCaster 40, TriCaster TCX40, TCX40, TriCaster 855, TriCaster TCX855, TCX855, TriCaster 455, TriCaster TCX455, TCX455, TriCaster EXTREME, TriCaster 850 EXTREME, TriCaster TCX850 EXTREME, TCX850 EXTREME, TriCaster 450 EXTREME, TriCaster TCX450 EXTREME, TCX450 EXTREME, TriCaster 850, TriCaster TCX850, TCX850, TriCaster 450, TriCaster TCX450, TCX450, TriCaster 300, ProTek, ProTek Studio, TriCaster BROADCAST, TriCaster DUO, MediaDS, MS51, 3PLAY, 3play, 3Play 3P1, 3Play 4800, 3PX4800, 3Play 440, 3PX440, 3Play Mini, 3Play 820, 3PX820, 3Play 425, 3PX425 3Play 330, 3PX330, TalkShow, TalkShow VS 4000, TalkShow VS100, Network Device Interface, NDI, NewTek Connect, NewTek Connect Spark, NewTek IsoCorder, ProTek, ProTek Care, ProTek Elite, iVGA, SpeedEDIT, IsoCorder, LiveText, LiveGraphics Creator, LiveGraphics, DataLink, LiveSet, LiveGraphics, TriCaster Virtual Set Editor, Virtual Set Editor Advanced Edition, TriCaster VSE, TriCaster VSE Advanced Edition, LiveMatte, TimeWarp, VT, VT[3], VT[4], VT[5], Video Toaster, Toaster, Inspire 3D, 3D Arsenal, Aura, LightWave, LightWave 3D and LightWave CORE are trademarks, service marks, and registered trademarks of NewTek. All other brand names, product names, or trademarks belong to their respective holders.