NewTek™

VMC1 IN™

Instructions

NDI™ Network Device Interface

Revised –September 5, 2016

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Chapter 1 INTRODUCTION AND SETUP

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

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 the most advanced live production tools available, 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 IN. 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 IN'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 IN's backplate
4. Turn on the computer monitor.
5. Press the *Power* switch on VMC1 IN'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 IN using an uninterruptable power supply (UPS), as for any 'mission critical' system.

Likewise, consider A/C "power conditioning", especially in situations where local power is unreliable or 'noisy'. Surge protection is especially

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,

important in some locales. Power conditioners can reduce wear on VMC1 IN'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 sources are connected to the appropriate inputs on VMC1 IN's backplate.

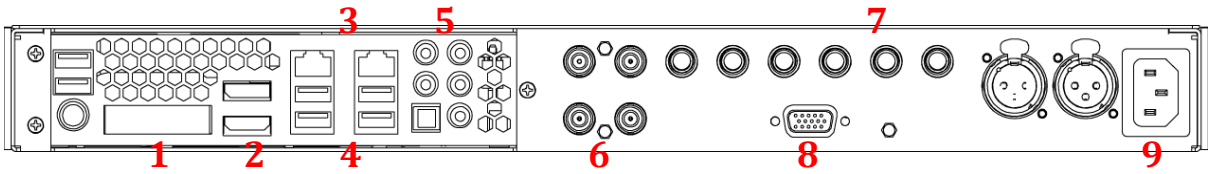


FIGURE 1-1

1. DVI – monitor port
2. HDMI – monitor port
3. Ethernet – network connection
4. USB – connect keyboard, mouse and other peripheral devices.
5. Motherboard audio connectors
6. Video In (SDI)
7. Audio In – 6x ¼" jacks in pairs a inputs 2-45 (input 1, at right, uses balanced line level XLR connectors)
8. Tally
9. Power

SECTION 1.4 TALLY LIGHTS

Tally indication can be received at VMC1 IN over a custom cable connected to the 15-pin Tally port on VMC1 IN's backplate. NDI connections are bi-directional, thus VMC1 IN outputs over NDI also natively support tally notification. A red border is drawn around the viewport for a VMC1 IN channel that is currently visible on *Program* output of a connected system with corresponding tally notification features, while a green border denotes *Preview* row selection (NDI tally connections only).

1.4.1 CONNECTION DETAILS

Here is a pin-out listing for VMC1 IN's HD15 *Tally connector*:

- Pin1 – LED1
- Pin2 – LED2
- Pin3 – LED3
- Pin4 – LED4
- Pin5 – unused
- Pin6 – unused
- Pin7 – unused
- Pin8 – unused
- Pin9 – GND
- Pin10 – GND
- Pin11 – GPI1
- Pin12 – GPI2
- Pin13 – NC
- Pin14 – 3.3V (20 Ohms current limit)
- Pin15 – NC

ENGINEERING NOTES

- Pins 1 - 4 are 'hot' when the LED should be illuminated.
- Each LED pin (1 – 4) has a 200 ohm current limiting resistor. With no load (open circuit) the LED pins can reach 5V. With a typical LED load, they can be expected to reach about 3V.
- GPI stands for General Purpose Interface. Pins 11 and 12 are assigned for possible future use, but support for GPI triggers has not been implemented at this time.

- To prevent damage to components when making connections to the *Tally* port, care should be taken that any connection to pins designated GND (Ground) is always at ground potential.

SECTION 1.5 NETWORKING

Generally, simply connecting a suitable cable from an Ethernet port on VMC1 IN'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.

Chapter 2 USER INTERFACE

This chapter explains the layout and options of the user interface, and how to configure VMC1 IN 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 VMC1 IN default Desktop interface is shown below, and provides very useful remote monitoring options in addition to configuration and control features.

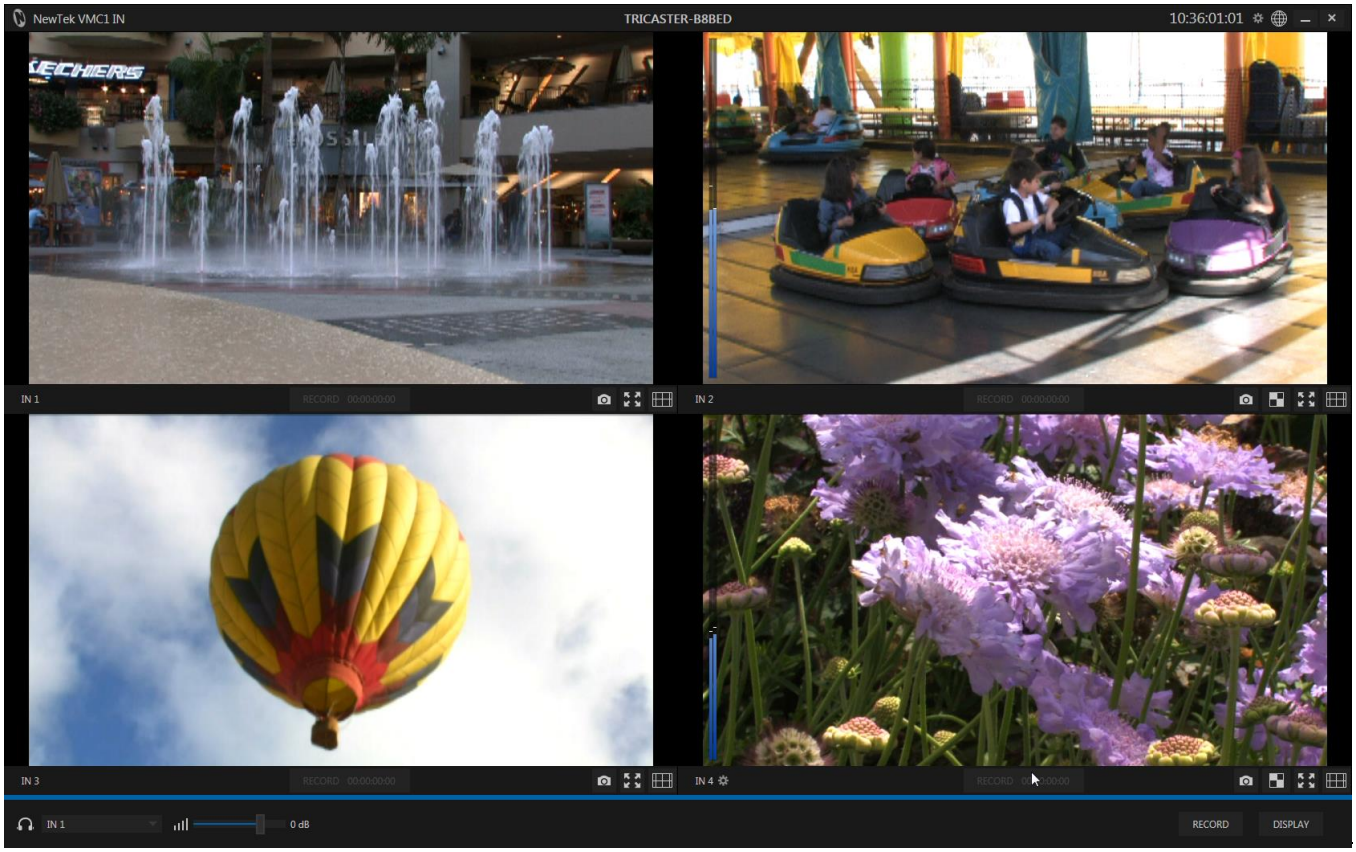


FIGURE 2-1

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 IN *Desktop*.

2.1.1 CONFIGURE CHANNELS

FIGURE 2-2

VMC1 IN allows you to select different audio and video sources for each channel via the *Configure* panel (Figure 2-3). Click the gear next to the channel label below a viewport to open its *Configure* panel (Figure 2-2).

INPUT TAB

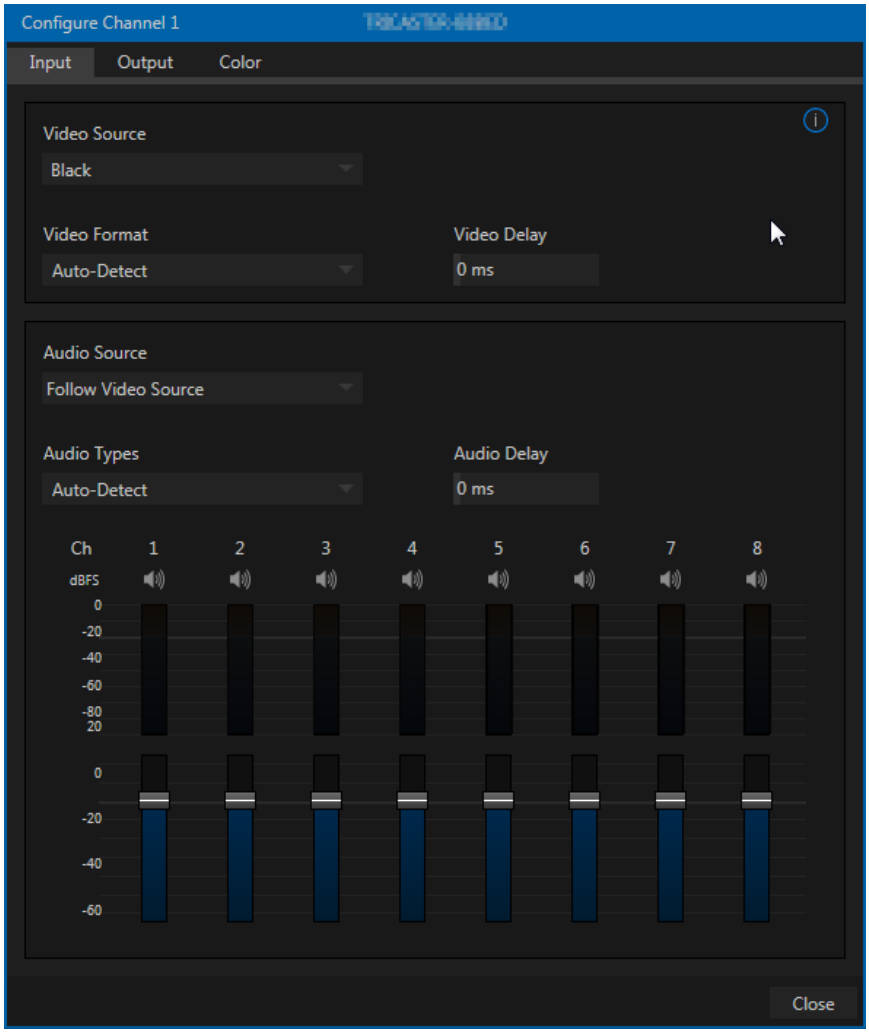


FIGURE 2-3

The tabbed *Input* pane allows you to select audio and video sources for this channel, and set their format. You can choose an NDI or SDI source, a webcam or PTZ camera with compatible network output, or even an input from a suitable external A/V capture device.

A *Delay* setting is provided for both audio and video sources, allowing precise A/V synchronization where a/v source timing differs.

IP Sources

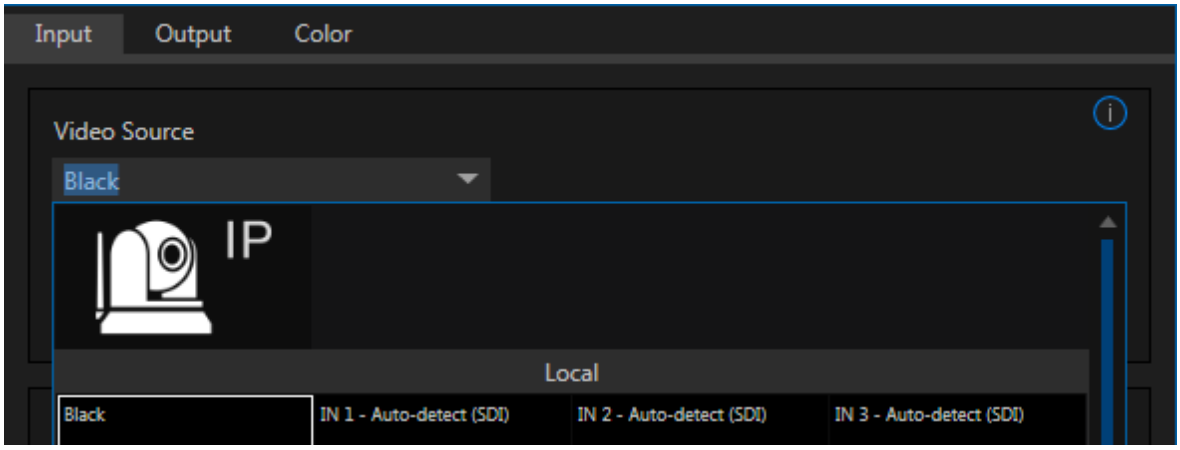


FIGURE 2-4

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).

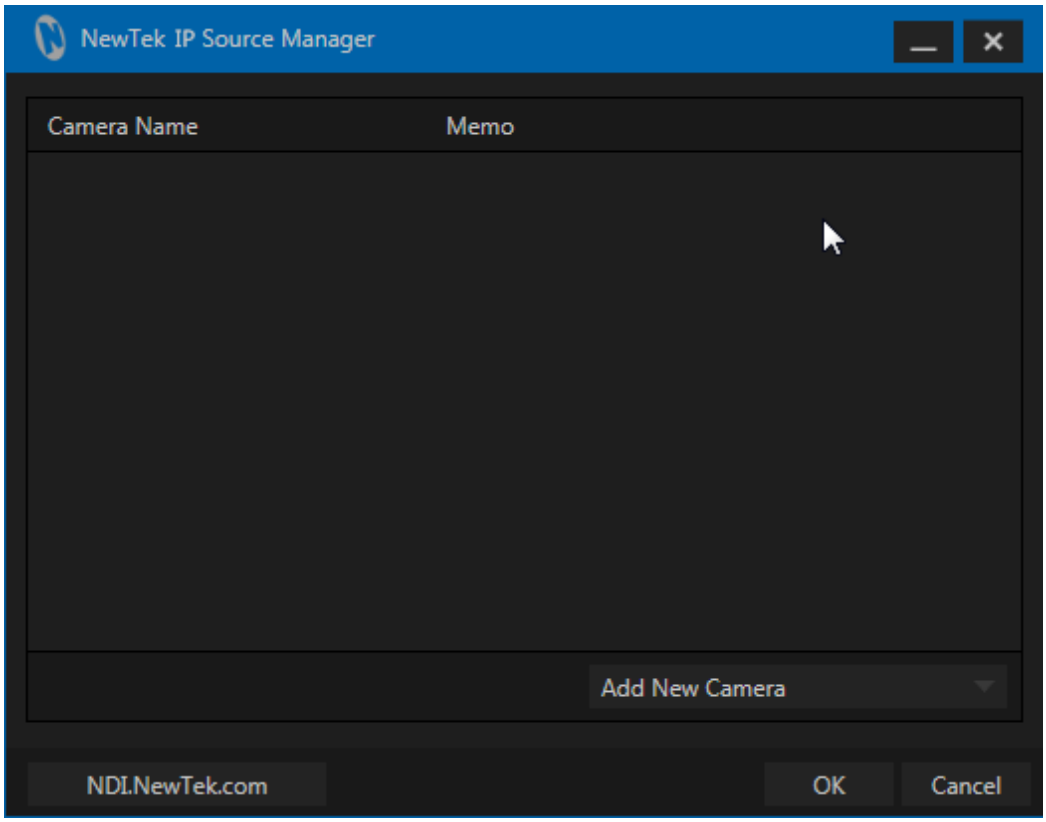


FIGURE 2-5

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).

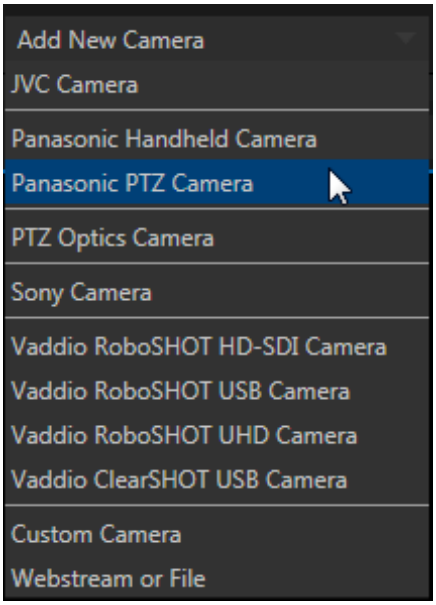


FIGURE 2-6

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.

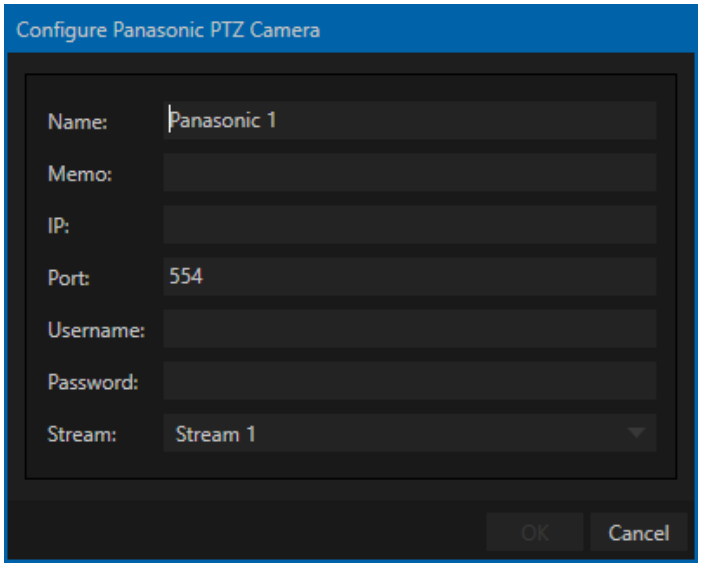


FIGURE 2-7

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

OUTPUT TAB

The second tab in the *Configure Channel* pane hosts settings related to output from the current channel.

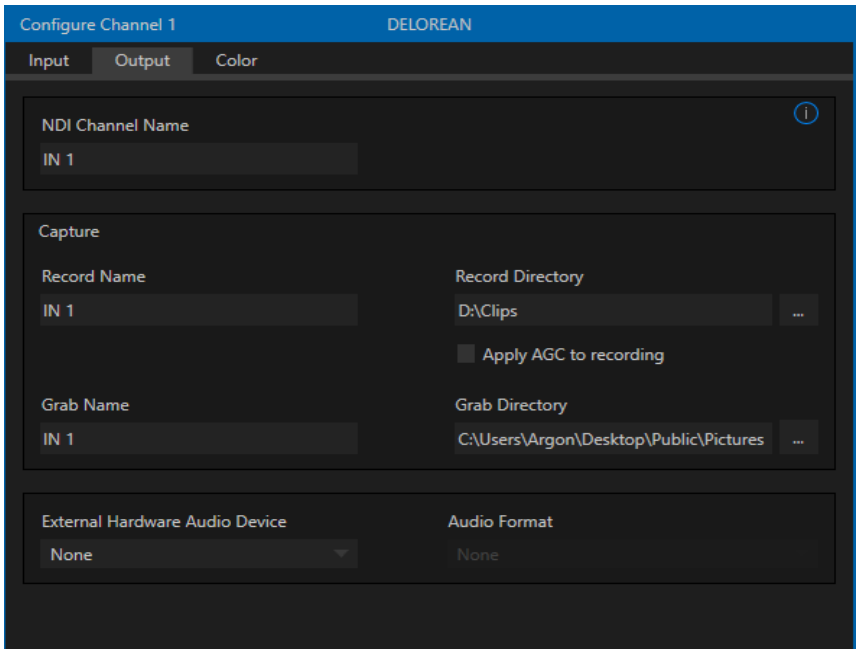


FIGURE 2-8

This tab (Figure 2-8) is also where you assign the path and base filename for captured video clips and stills.

The initial *Record* and *Grab Directories* are 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.

NDI Output

The output from the channel is always sent 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.

External Audio Hardware

The *External Hardware Audio Device* allows you to direct audio output to system sound devices as well as well as any supported third part audio devices you may connect (typically by USB).

Color Tab

The *Color* tab provides an extensive set of tools for adjusting the color characteristics of each video channel.

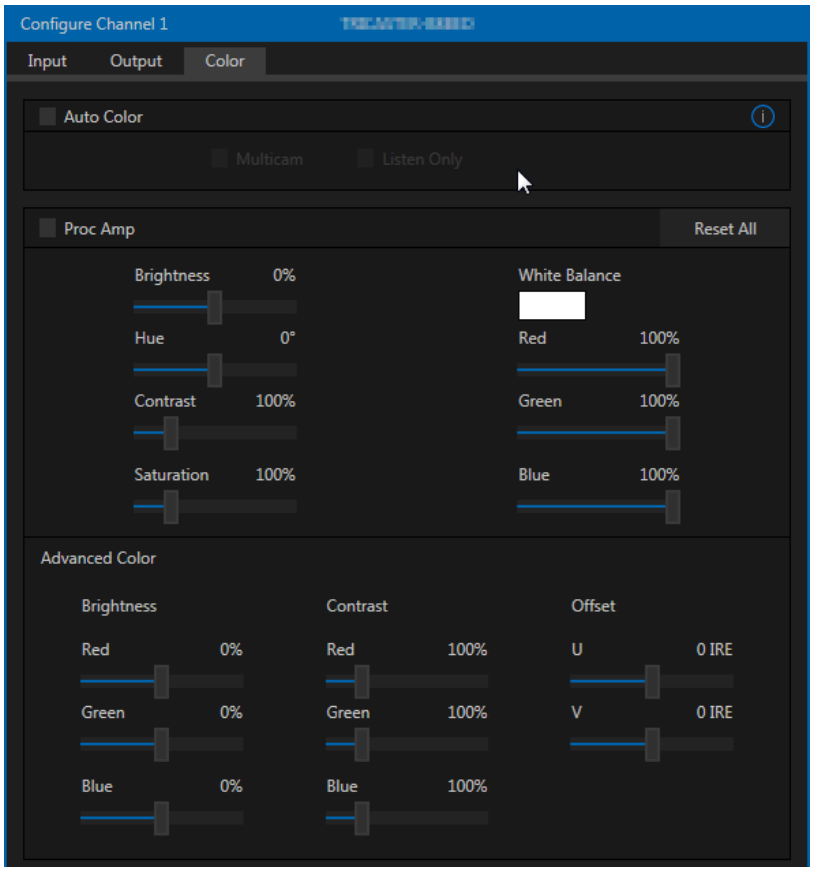


FIGURE 2-9

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).

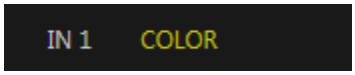


FIGURE 2-10

SECTION 2.2 TITLEBAR & DASHBOARD TOOLS

VMC1 IN'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.

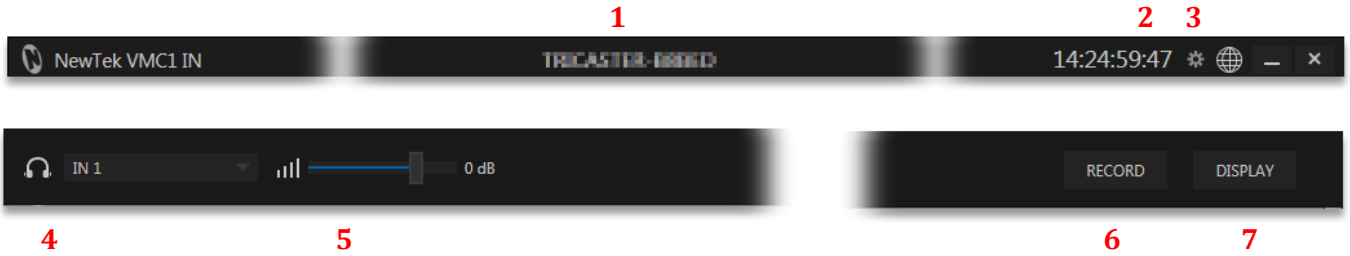


FIGURE 2-11

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

1. *Machine name* (the system network name supplies the prefix identifying NDI output channels).
2. *Time Display* and *Configuration* (see section 0)
3. *Information* – Links to online resources and system information.
4. *Headphones source* (see section 0)
5. *Volume*
6. *Record* (see section 0)
7. *Display* (see section 2.2.2)

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

FIGURE 2-12

VMC1 IN's channels each have a toolbar beneath their respective viewports. The various elements comprising the toolbar are listed below from left to right:

1. *Channel name* – Can be changed by clicking on the label, and also in the *Configure Channel* panel.
    a. A *Configuration* gadget (gear) pops up next to the channel name when the mouse is over a viewport.
2. *Record* and *Record Time* – The record button below each viewport toggled recording that channel; the *RECORD* button in the bottom dashboard opens a widget enabling capture for any or all channels.
3. *Grab* – the base filename and path for still image grabs are set in the Configure Channel panel.
4. *Full screen* (Section 0)
5. *Overlays* (Section 0)

ALPHA MATTE

FIGURE 2-13

The *Alpha Matte* tool is found at lower-right below each even-numbered VMC1 IN channel. For key/fill source configurations, assign the Alpha Matte source to the even-numbered channel, and enable the *Alpha Matte* button (see Figure 2-13).

Note: *Key/fill sources must be synchronized and have the same format.*

GRAB

FIGURE 2-14

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 the Output heading above).

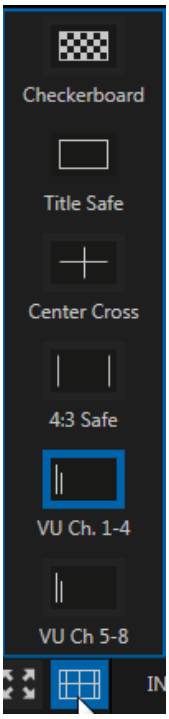


FIGURE 2-17

FULLSCREEN


FIGURE 2-15

Clicking this button expands the video display for the selected channel to fill your monitor. Press ESC on your keyboard or click the mouse to return to the standard display.

OVERLAY


FIGURE 2-16

Found in the lower right corner of each channel an *Overlay* can be a useful tool for visualizing safe zones, centering and more. To use an overly just click on the icon in the list (see Figure 2-17), more than one overlay can be active at the same time.

2.2.2 DASHBOARD TOOLS

MONITORING

In the bottom-right corner of the *Dashboard* at the bottom of the (primary) screen, the *Display* widget offers a variety of layout options to let you viewing channels individually or in groups, as well letting you configure a second monitor (Figure 2-18).

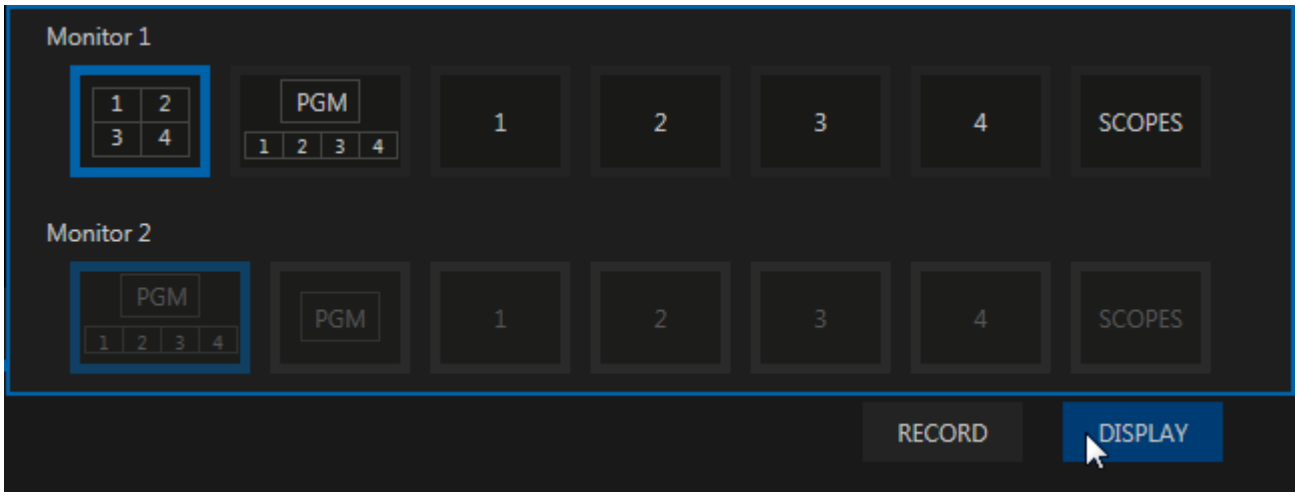


FIGURE 2-18

Among the layout options, a *Waveform* and *Vectorscope* can also be found here in the *Display* widget (Figure 2-19).

FIGURE 2-19

RECORD

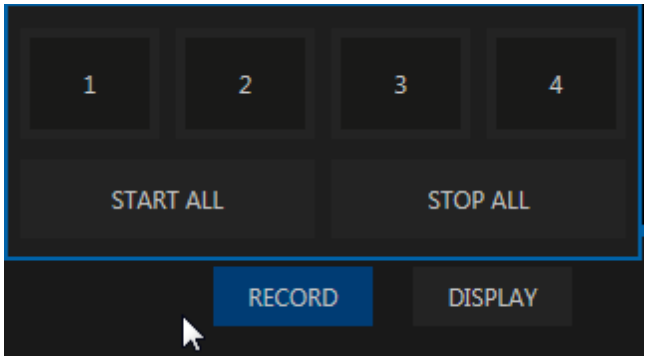


FIGURE 2-20

The *Record* button is also located in the lower-right corner of the dashboard (Figure 2-20). Click it to open a widget allowing you to begin or stop recording of individual channels (or start/ stop all recordings.)

Note: The destination for recorded clips, their base file names and other settings are controlled in the Configuration panel (see Figure 2-3).

TIMECODE

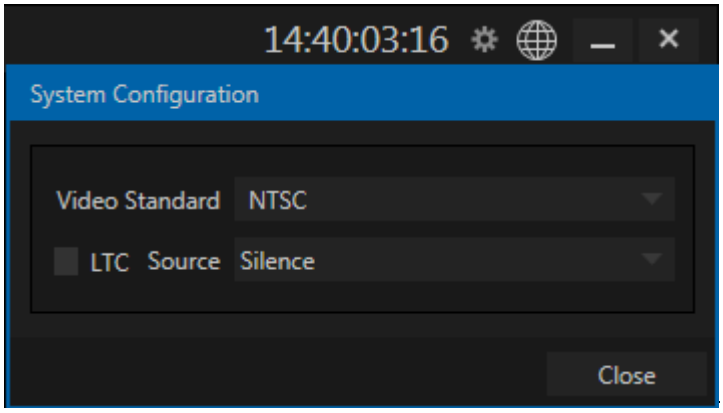


FIGURE 2-21

LTC timecode support can be activated in the ***S**ystem Configuration* panel opened by clicking the configuration (gear) gadget found in the upper-right corner of the screen (Figure 2-21). The source menu allows you to choose almost any audio input to receive the timecode signal over.

AUDIO (HEADPHONES)

You can connect a headset to the (green) audio output jack on the rear of VMC1's motherboard.

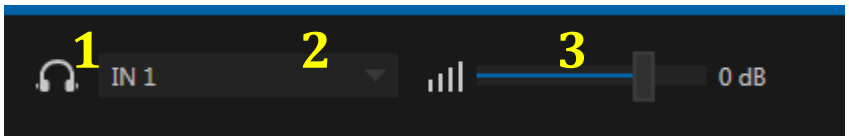
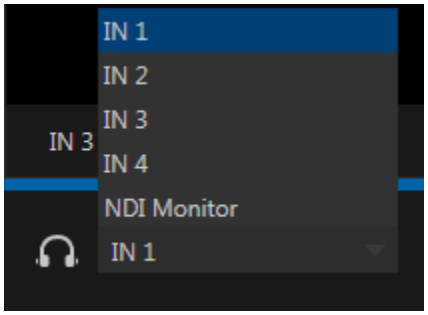


FIGURE 2-22



1. Controls for *Headphone audio* are found in the lower-left corner of the dashboard at the bottom of the screen (Figure 2-22).

2. The audio source supplied to the *Headphone* jack can be selected using the menu next to the *headphone icon* (Figure 2-23).

3. The *Volume* for the selected source can be adjusted moving the slider provided at right (double-click this control to reset it to the default 0dB value).

FIGURE 2-23

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. Although VMC1 IN provides many other useful features, it is purpose designed primarily to turn SDI sources into NDI signals.

APPENDIX B: DIMENSIONS AND MOUNTING

VMC1 IN is designed for convenient mounting in a standard 19" rack (mounting rails are available separately from NewTek Sales). The unit comprises a 1 Rack Unit (RU) chassis supplied with 'ears' designed to permit mounting in standard 19" rack architecture.

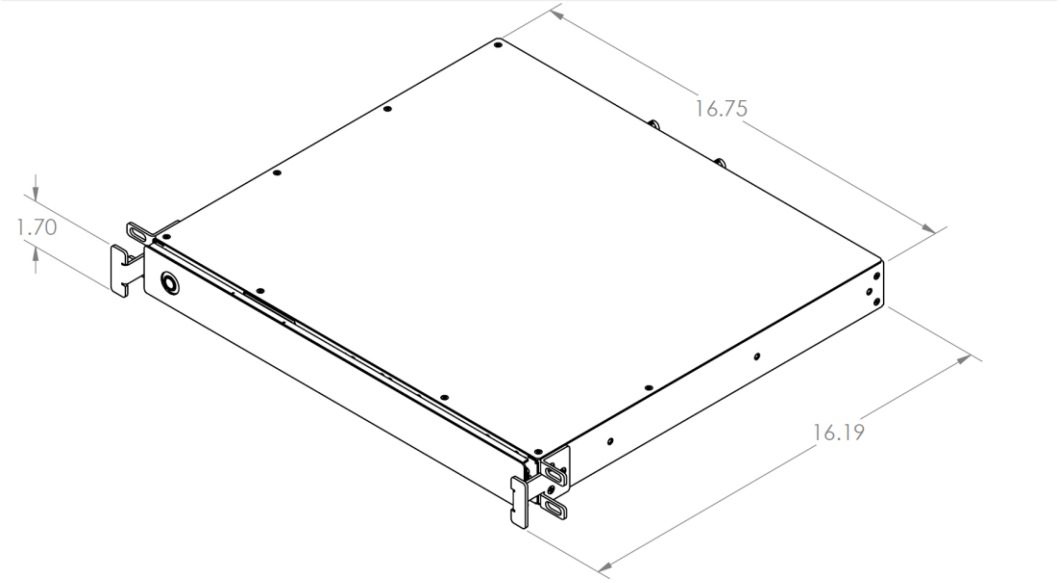


FIGURE 2-24

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. Please keep in mind that adequate cooling is a very important requirement for virtually all electronic and digital equipment, and this is true of VMC1 IN as well. We recommend allowing 1.5 to 2 inches of space on all sides for cool (i.e., comfortable 'room temperature') air to circulate around the chassis. Good ventilation at the front and rear panel is important, and ventilated space above the unit (1RU minimum is recommended).

When designing enclosures or mounting the unit, supplying good free air movement around the chassis as discussed above should be viewed as a critical design consideration. This is especially true in fixed installations where VMC1 IN will be installed inside furniture-style enclosures.

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 IN, the following standards are applicable:

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

CREDITS

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NDI™ Network Device Interface