NewTek™

NDI™ for Adobe® Creative Cloud®

User Guide

NDI™

Revised – Jan 23, 2017

Trademarks: NewTek, NewTek VMC1, NewTek VMC1 IN, NewTek VMC1 OUT, NewTek VMC1 STREAM, TriCaster, 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 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 IsoCorder, ProTek, ProTek Care, ProTek Elite, iVGA, SpeedEDIT, IsoCorder, LiveText, DataLink, LiveSet, TriCaster Virtual Set Editor, Virtual Set Editor Advanced Edition, TriCaster VSE, TriCaster VSE Advanced Edition, LiveMatte, TimeWarp, VT, VT[3], VT[4], V[T5], 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..

CONTENTS

CHAPTER 1 GETTING STARTED 3

SECTION 1.1 INTRODUCTION 3

1.1.1 What is NDI? *3*

1.1.2 Why NDI for Adobe Creative Cloud? *3*

SECTION 1.2 LEAN MORE ABOUT NDI 4

CHAPTER 2 INSTALLATION AND CONFIGURATION 5

SECTION 2.1 SYSTEM REQUIREMENTS 5

SECTION 2.2 INSTALLING THE NDI SOFTWARE 5

SECTION 2.3 CONFIGURING YOUR APPLICATIONS 7

2.3.1 Adobe After Effects® CC *7*

2.3.2 Adobe Premiere Pro® CC *9*

2.3.3 Adobe SpeedGrade® CC *10*

CHAPTER 3 VIEW, CAPTURE AND MANAGE YOUR NDI OUTPUT 12

SECTION 3.1 MONITORING 12

SECTION 3.2 CAPTURE 13

SECTION 3.3 CONTROL ACCESS 14

APPENDIX A HELP 15

SECTION A.1 CONNECTIONS 15

A.1.1 Client System does not see My NDI Output? *15*

SECTION A.2 DEBUGGING FAILED CONNECTIONS 15

SECTION A.3 NDI AND YOUR NETWORK 16

SECTION A.4 ROUTERS AND FIREWALLS 16

SECTION A.5 DOES MY PRODUCTION SYSTEM SUPPORT NDI? 17

A.1.2 NewTek TriCaster Mini, Mini SDI, 410, 460, 860, 8000 ..... *17*

A.1.3 NewTek TriCaster Advanced Edition *17*

A.1.4 Other TriCaster Models *17*

A.1.5 NewTek TalkShow *17*

CREDITS 18

CHAPTER 1 GETTING STARTED

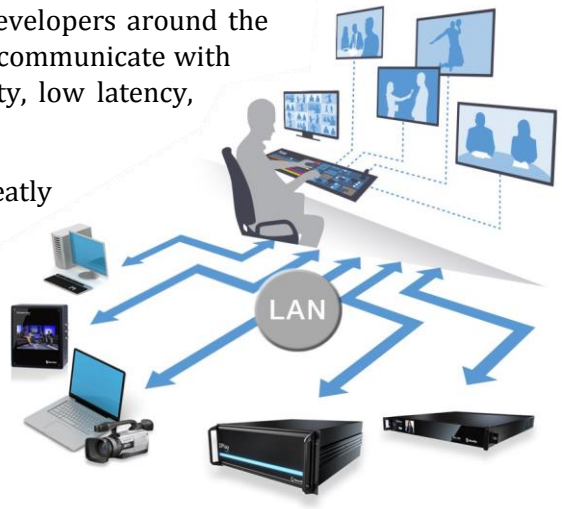
SECTION 1.1 INTRODUCTION

Thank you for choosing NewTek® NDI™ for Adobe® Creative Cloud®. This software adds support for NDI (Network Device Interface) output to the Adobe Mercury Transmit™ system. In turn, this enables video output over IP using the NDI protocol from popular Adobe applications including Premiere Pro®, After Effects®, and SpeedGrade®. In turn, the NDI video output from the Adobe application is available to any NDI-enabled device, system or software on the network. The implications of this ability are huge, and can greatly expedite your workflow.

1.1.1 WHAT IS NDI?

> "It was a dark and stormy night. Outside, the world was caught up in a mad Babel of competing IP video transport schemes incapable of communicating with one another (or at least disinclined to do so)."

EOK, it was only dark and stormy metaphorically ... but the rest does not require much exaggeration. Enter NewTek's Network Device Interface™ (NDI), a fresh IP video over Ethernet standard for live production that has been freely shared with qualified developers around the globe. NDI allows video 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. Devices such as NewTek's TriCaster® and a growing number of third party systems provide direct NDI support.

As well, you can connect older devices and systems to your NDI workflow using the free NewTek Connect™ application with a supported third-part video i/o card (Blackmagic Design®, Deltacast, and AJA® Video Systems).

1.1.2 WHY NDI FOR ADOBE CREATIVE CLOUD?

"DEAR SISYPHUS ..."

In almost all production environments, every graphic, animation, or video project is reviewed many times before it reaches the broadcast or distribution chain. The approval process often involves countless tweaks, reviews, and still more revisions. Usually, even if a graphics application supports realtime playback, it is nonetheless necessary to render the project to a media file that can be provided to various stakeholders for review, rinsing and repeating many times until everyone signs off on the result.

Imagine, dear Sisyphus, if you didn't need to render that stone each time you rolled it to the precipice.

"Do You Like it Now?"

With NDI for Adobe Creative Cloud, when (for example) you play an edit project on the timeline in Premiere Pro, enabling NDI output lets anyone on the same network view it on their local monitor in realtime (using the free NDI Monitor application from ndi.NewTek.com; Windows® version available now). While you'll not likely escape rendering entirely, with a little collaboration via instant messaging (or if you prefer, simply yelling "Hey, check it out now!" really loud), you can really accelerate the creative process.

Live to Air/Drive/Borneo

Let's consider a few more examples:

- Imagine sending After Effects output live-to-air, directly injecting it into your broadcast pipeline, without rendering or file transfer.
- View SpeedGrade output on a centralized calibrated monitor, and send it to air at the same time.
- Capture output from CC applications to file anywhere in your facility that your network runs, using the free NewTek NDI™ IsoCorder™, or its commercial sibling NDI™ Isocorder Pro™.
- For more distant collaboration, you might add NewTek NDI Transmit™ (see ndi.NewTek.com), which supplies a designated NDI source to almost any application that accepts webcam input (including Skype™, VLC, Adobe Flash Media Live Encoder™, and many more).

  Invite a circle of reviewers to Google+ Hangouts Live™ and everyone can share and discuss your high quality NDI output at once, almost anywhere in the world.

These are just a few of the ways you can combine the large and growing number of free and commercial NDI tools to enhance your workflow, and show off your creativity.

SECTION 1.2 LEAN MORE ABOUT NDI

The applications of NDI in production workflows, and the number of innovative NDI-enabled devices, systems and applications is constantly growing. We highly recommend a visit to ndi.NewTek.com as a good starting point to discover how you can benefit. While there, download the free "Getting Started with NDI" download, as it will give you a nice introduction to the topic. NewTek also maintains NDI user forums – you can find these at http://forums.newtek.com/.

CHAPTER 2 INSTALLATION AND CONFIGURATION

This chapter will walk you through the simple steps required to install your NDI software and configure the various host applications from Adobe®.

SECTION 2.1 SYSTEM REQUIREMENTS

Minimum system requirements:

- 32-bit or 64-bit Microsoft® Windows Vista® operating system or better
- Minimum Intel i3 Sandy Bridge CPU (2008 or later), better strongly encouraged.
- Gigabit LAN connection for signal transmission over IP via NDI™ Technology

SECTION 2.2 INSTALLING THE NDI SOFTWARE

Here is a walk-thru of the installation process:

1. Begin by double clicking the Installation file to begin the set up process. The first page you will see is the *Welcome* page – click "Next" at the bottom.
2. The *License Agreement* is shown after the *Welcome* page. Please read this, select a switch in the footer to indicate whether you accept the agreement, and click *Next* (Figure 2-1).

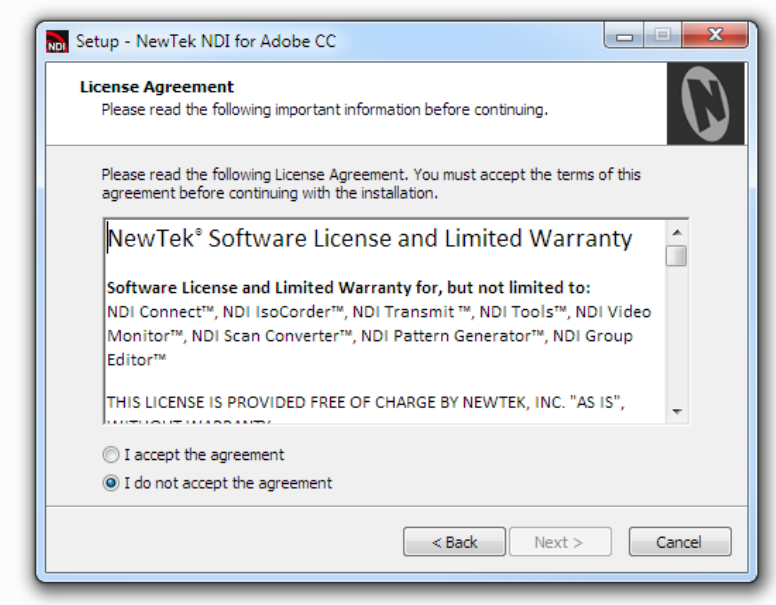


FIGURE 2-1

3. The next few pages establish where the software will be installed and where Start Menu shortcuts will be placed. The defaults should be just fine, so you can click *Next* on these two pages.

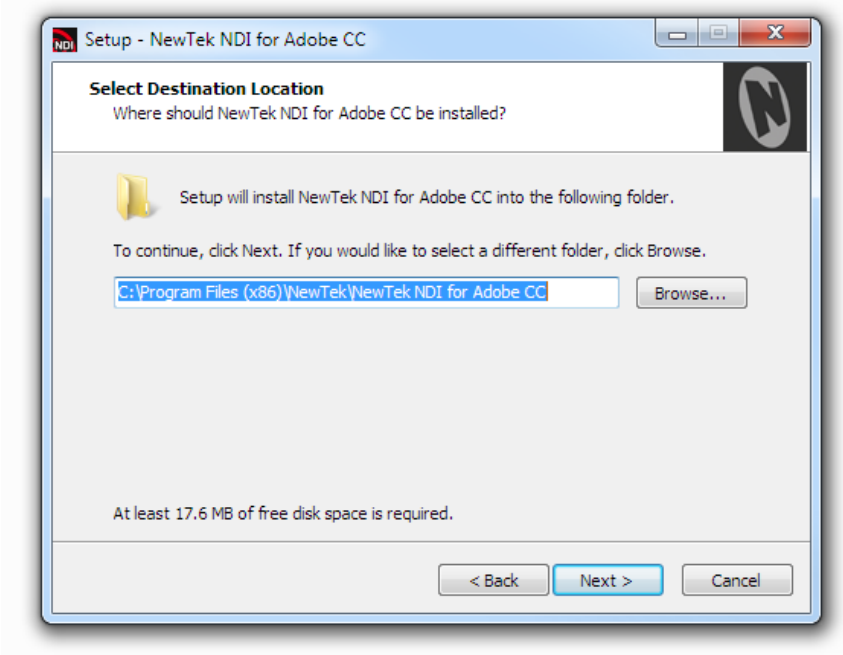


FIGURE 2-2

4. The *Select Components* page will allow you to customize your installation (Figure 2-3). When you are ready click *Next*.

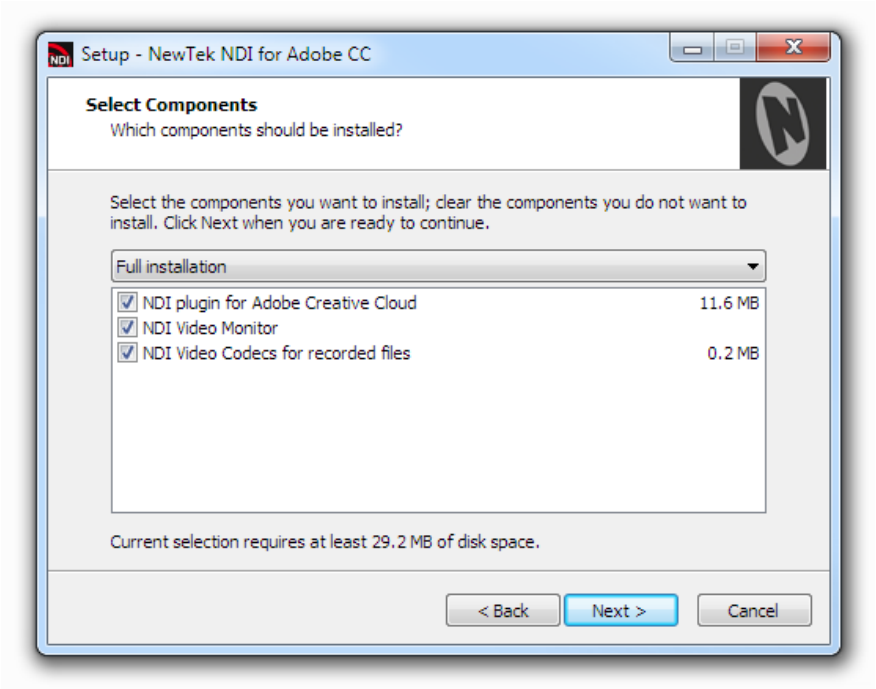


FIGURE 2-3

5. You will see a menu verifying where and what files will be installed. Click *Next*, and a confirmation page will undoubtedly pop up momentarily to indicate a successful installation.

SECTION 2.3 CONFIGURING YOUR APPLICATIONS

After installation, you will need to activate NDI output in your various Adobe® Creative Cloud® applications before you can start using it.

2.3.1 ADOBE AFTER EFFECTS® CC

1. To activate NDI output for Adobe After Effects® CC, use the *Edit* menu to go to *Preferences>Video Preview* (Figure 2-4).

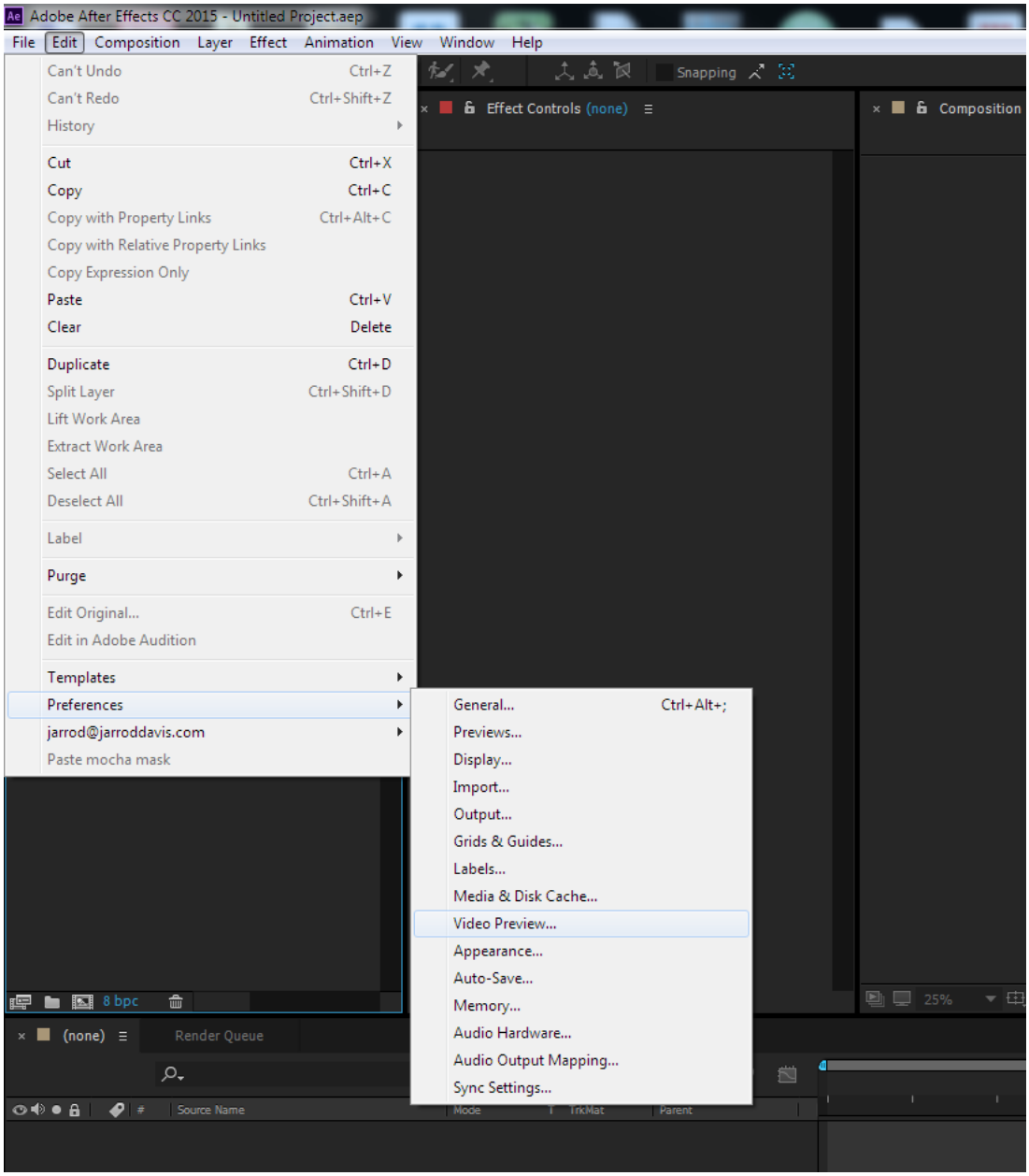


FIGURE 2-4

2. In the *Preferences* panel, you should see *NewTek NDI output* located under the *Video Device* section of the panel (Figure 2-5).

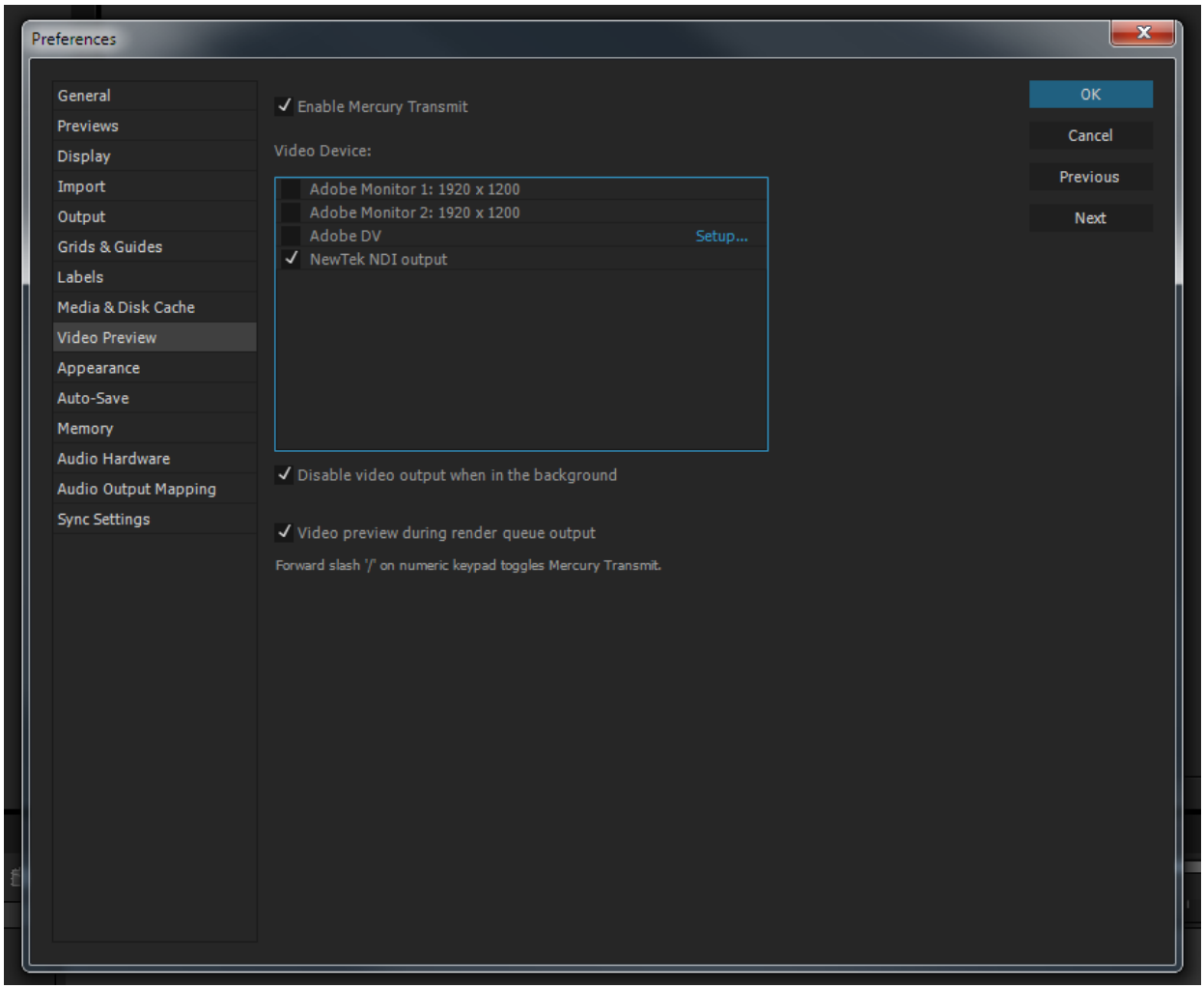


FIGURE 2-5 ADOBE AFTER EFFECTS PREFERENCES

2.3.2 ADOBE PREMIERE PRO® CC

1. In Adobe Premiere Pro® CC, go to *Edit>Preferences>Playback* (as shown in Figure 2-6).

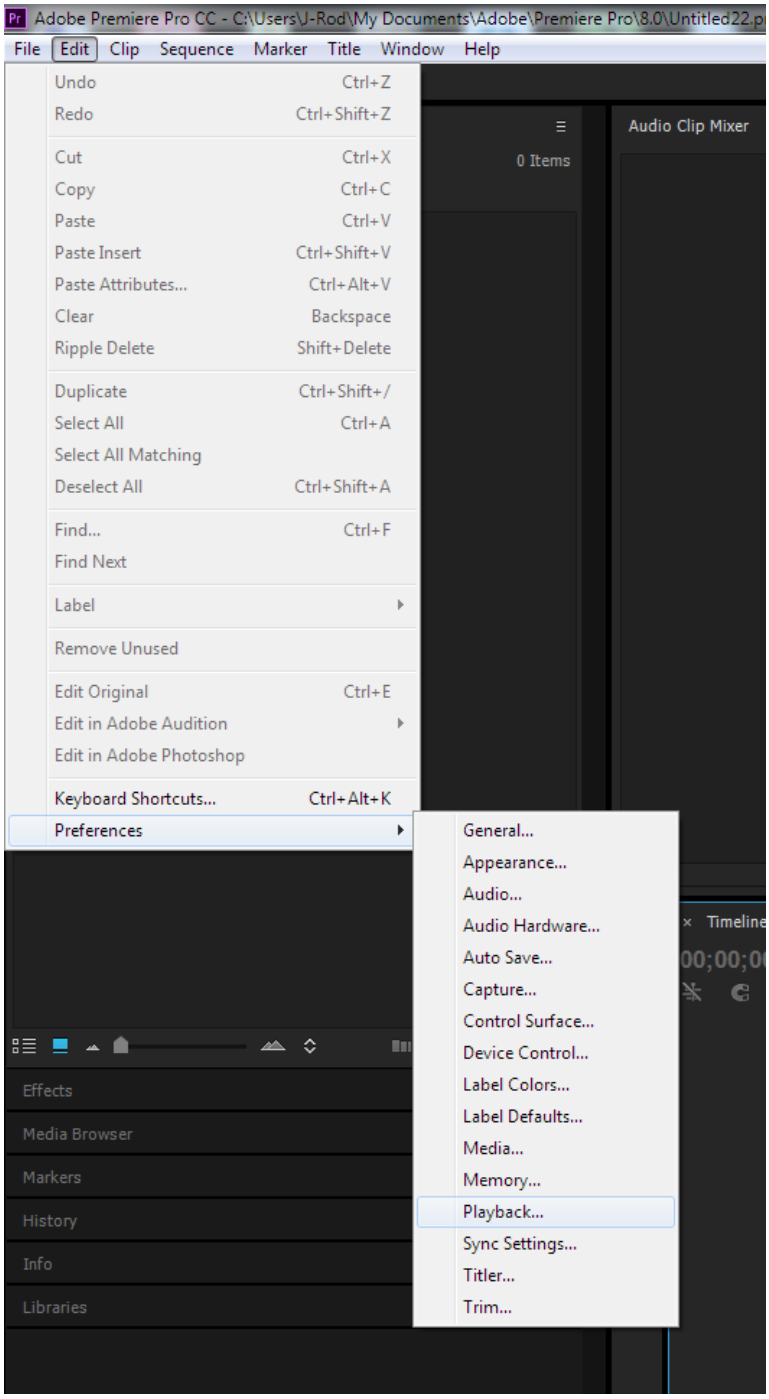


FIGURE 2-6

2. This will open the *Preferences* panel. There you will find *NewTek NDI output* as an option under *Video Device* (see Figure 2-7).

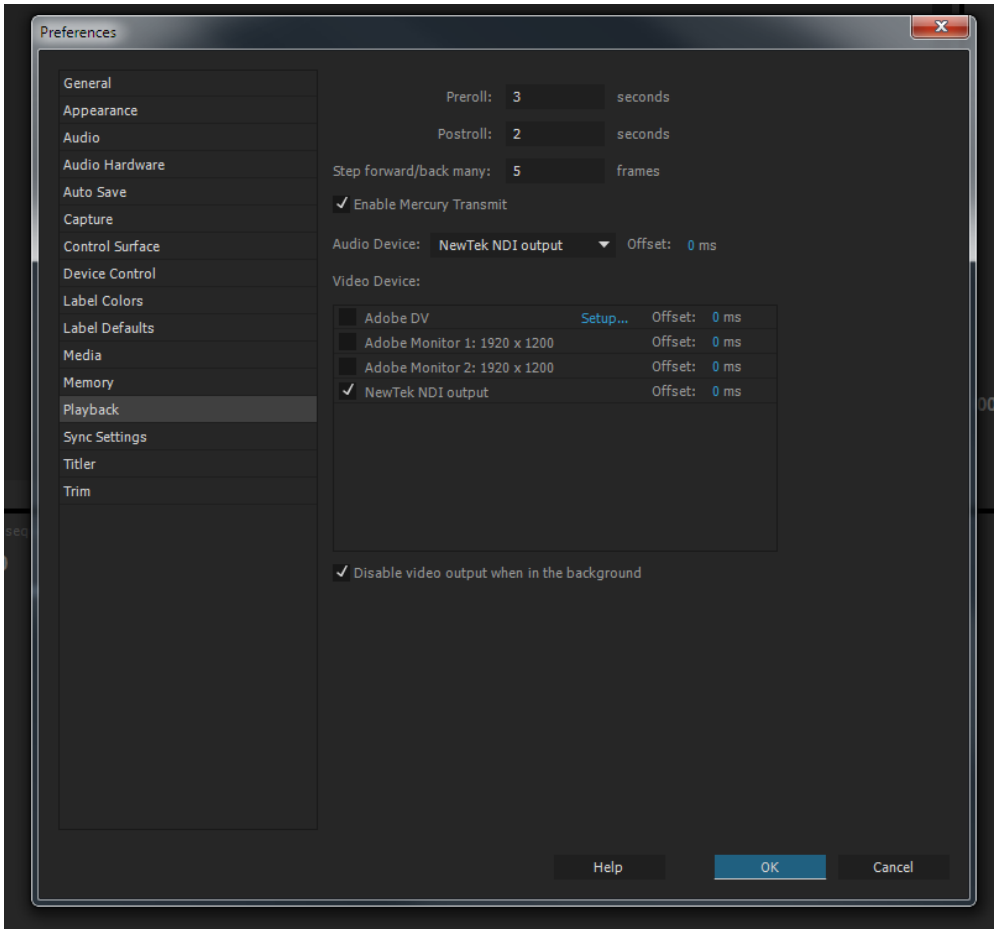


FIGURE 2-7

2.3.3 ADOBE SPEEDGRADE® CC

1. In Adobe SpeedGrade® CC, click the 'wrench' icon in the titlebar to access the application *Preferences* pane (Figure 2-8).

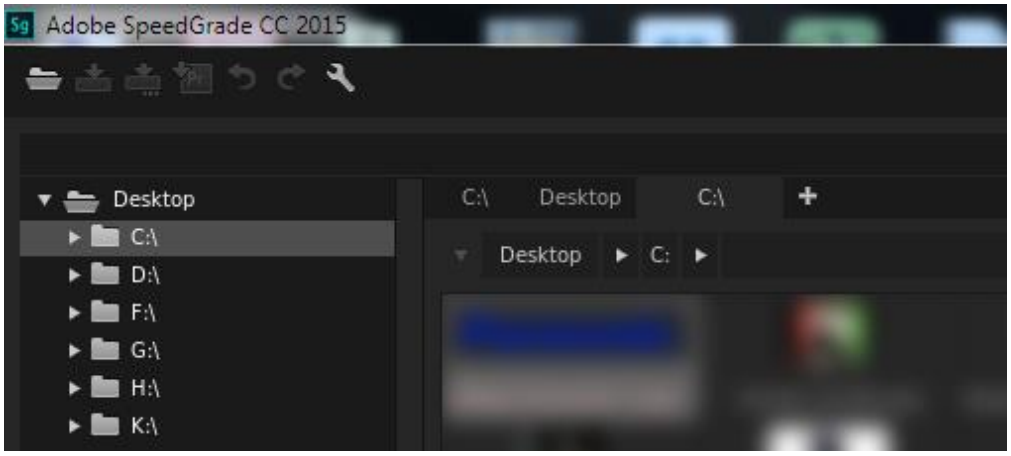


FIGURE 2-8

2. Select the *Display* heading in the column at left (Figure 2-9).

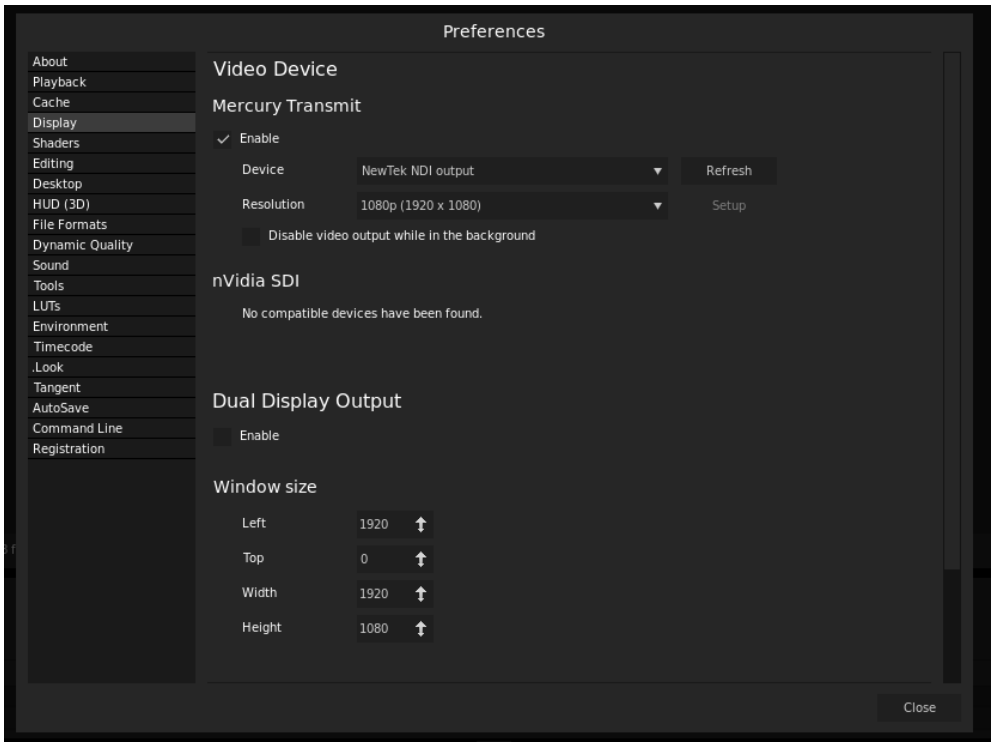


FIGURE 2-9

3. Use the *Device* menu in the *Mercury Transmit* control group at right to select *NewTek NDI Output* (Figure 2-9).

4. Close the *Preferences* panel to continue.

CHAPTER 3 VIEW, CAPTURE AND MANAGE YOUR NDI OUTPUT

Of course, now that you've installed NewTek® NDI™ for Adobe® Creative Cloud®, you're going to want to view the output. One easy way to do so is to use the free *NewTek NDI Video Monitor* utility.

This application was installed automatically on your host system along with NewTek® NDI™ for Adobe® Creative Cloud®. Continuing, it's time to enable an NDI video source, if you didn't do so previously, using one of the Adobe® applications mentioned in the previous chapter.

SECTION 3.1 MONITORING

At this point, launch NewTek NDI Video Monitor (Figure 3-1) from the Windows® Start menu on the host system.

FIGURE 3-1

Hint: Simple instructions are shown at upper-left in the NewTek NDI Video Monitor window ().

1. Right-click the NDI Video Monitor window, wait a few seconds for the source list to refresh, then select the entry representing your application output in the menu – e.g., "*MyMachineName* (After Effects)". (The first part of the source listing is your computer's name on the network).

FIGURE 3-2

NewTek NDI Video Monitor is now showing the content from the NDI channel output by your Adobe® application.

Hint: Double-click NDI Video Monitor to toggle full screen display.

You'll appreciate that for NDI sources, networked client systems do not need a hardware card with SDI connectors, long SDI cables, or another external monitor to view your NDI source. If your computer has a

network connection already, you are already broadcasting high quality, low latency, full-framerate video across your local network, and each NDI-enabled application and system has realtime access to it.

To test this capability out on an external network client:

2. Download and install the free NDI Tools pack from ndi.NewTek.com.
3. Launch NDI Video monitor on that second system, and select your NDI source.

In many ways your NDI-enabled network is now operating like a powerful video matrix router connecting everything to everything, with NDI maintaining complete visibility, identification, bandwidth management, and so on.

SECTION 3.2 CAPTURE

You may find it very useful to be able to capture your video output to media files. *NewTek NDI IsoCorder™* provides the necessary functionality, allowing NDI channels on your network to be both monitored and recorded. Capture from different sources can be started and stopped independently or simultaneously, and files are encoded to a broadcast quality Quicktime format compatible with all common production software

You can download NewTek codec packs for both Windows® and OS X® systems without cost from the URL shown below:

http://www.newtek.com/support/documentation.html#codecs).

A more powerful commercial application named *NewTek NDI IsoCorder Pro* provides additional recording capabilities. With suitable hardware, *NewTek NDI IsoCorder* can record up to 16 different NDI channels directly from your network to disk at one time.

FIGURE 3-3 (NDI ISOCORDER PRO)

NewTek NDI IsoCorder Pro includes many powerful features, including realtime color correction tools, safe area overlays, checkerboard and dual monitor display options, still image grabs, 8-channel audio level

control, and also includes support for directly capturing files with embedded alpha from 32bit NDI sources (such as you might supply from After Effects CC).

This powerful application can make media capture and archiving operations in your studio much more economical than traditional alternatives, and much more flexible as well.

SECTION 3.3 CONTROL ACCESS

As you come to appreciate the power of NDI, you'll doubtless want more and more of such convenient video sources. You could easily wind up having hundreds of video sources available. In most production facilities, though, you will want to limit visibility of NDI channels from selected systems to certain viewers or specified systems.

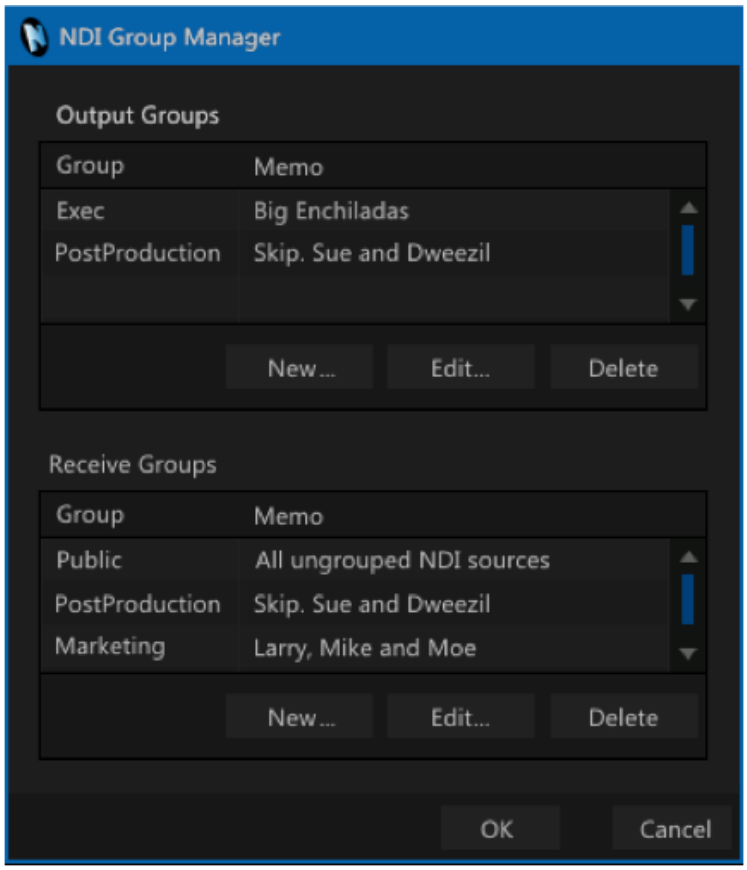


FIGURE 3-4

The *NewTek NDI Group Manager* (included in the *NewTek NDI Tools Pack*) makes all of this quite easy. It enables you to group video sources together, choose which groups your local sending sources are members of, and which groups you want to see listed on your (or any) system.

By default, all NDI channels on your network are in the 'Public' group, making them visible to all other NDI clients.

Adding a custom *Output group** allows others to access your local NDI output by simply adding that entry to their local *Receive group* list.

Then, if you remove *Public* from your *Output groups*, only those systems configured to receive one of your active *Output groups* will ever see your NDI output.

Similarly, by removing *Public* from your own *Receive groups*, your system will ignore all channels that are not members of your remaining *Receive groups*.

This simple mechanism allows completely configurable NDI channel control at each NDI-enabled access point on your network.

*Note: Modifications require a re-start.

Appendix A HELP

In this section, we'll consider common problems you may encounter using when NewTek NDI™ Connect. Where appropriate, we'll also point you to explanatory information elsewhere in this manual or elsewhere. If you've largely mastered your NDI Connect but questions, this may be the best place to look first.

Hint: The NewTek website includes a comprehensive FAQ database containing a wealth of useful information on all of its products – please see http://www.newtek.com/faq/

Table of Contents

CONNECTIONS 15
Client System does not see My NDI Output *15*
Debugging Failed Connections *15*
NDI AND YOUR NETWORK 16
Routers and Firewalls *16*
DOES MY PRODUCT SUPPORT NDI? 17
NewTek TriCaster Mini, Mini SDI, 410, 460, 860, 8000 ..... *17*
TriCaster Advanced Edition *17*
Other TriCaster Models *17*
NewTek TalkShow *17*

SECTION A.1 CONNECTIONS

Like any network based system, NDI depends on at least two machines or devices being able to connect and communicate with each-other; of course there are a number of reasons why this might not be successful in any environment. This section will help explain the most common issues and help you diagnose and correct them to get the full benefit of NDI.

A.1.1 CLIENT SYSTEM DOES NOT SEE MY NDI OUTPUT?

If you cannot see other NDI sources on the network, the two most common causes are:

1. The NDI sources might not be in the same NDI groups as you are monitoring. The easiest way to check this is to use the NDI Group Manager (provided in NDI Tools) and remove to all of the listed sending and receiving groups for both systems.
2. The mDNS ports NDI requires are blocked on either the sender, receiver or network.

SECTION A.2 DEBUGGING FAILED CONNECTIONS

If you can see other NDI sources on the network, the most common cause is that the port numbers required for video transfer are blocked by local firewalls, or by the network hub itself.

To debug failed connections, proceed as follows:

1. Run reliable NDI sending and receiving applications (such as *NDI Test Patterns* and *NDI Video Monitor*, both in *NDI Tools*) on the same computer system. This approach bypasses the local network infrastructure. If they fail to connect, then the problem is either your NDI group configuration, or local software based firewalls.
2. Connect two computers together using a network crossover cable. If NDI connections succeed in this configuration but fail when attached to the network, the network infrastructure is the most likely cause of the problem.

SECTION A.3 NDI AND YOUR NETWORK

Basically, NDI networking consists of just two operations:

1. It detects other NDI sources on the network using mDNS. mDNS uses port 5353.
2. It establishes direct communication between sources using ports provided by the operating system. In Microsoft Windows, for example, you can determine what range of port numbers might be used with:

    netsh int ipv4 show dynamicport tcp

High port numbers are relatively common. On modern OSes the port numbers typically start around 49000.

SECTION A.4 ROUTERS AND FIREWALLS

Obviously your local network router or switch must permit communication using the ports assigned to NDI. Although most common networks do not block the mDNS port, it is not uncommon for networks to be configured to block high port numbers. This would prevent NDI from transmitting video.

Similarly, a software based firewall on the system itself might block the ports used by NDI. It is best to first test with firewalls turned off, then add the relevant firewall rules as needed.

Although it is not recommended, the default range of ports are used for dynamic allocation can be configured in most modern OSes. For instance, Microsoft Windows can be instructed to use ports 10000-11000 with the following command:

    netsh int ipv4 set dynamicport tcp start=10000 num=1000

Note, too, that WIFI routers often block multicast traffic or transfer over certain port ranges between wired and wireless networks.

SECTION A.5 DOES MY PRODUCTION SYSTEM SUPPORT NDI?

A.1.2 NEWTEK TRICASTER MINI, MINI SDI, 410, 460, 860, 8000

Version 2-5 for these systems provides support for NDI using the Net 1 and 2 inputs and Network output. This update may be downloaded from the NewTek website.

A.1.3 NEWTEK TRICASTER ADVANCED EDITION

The TriCaster Advanced Edition version 3-2 provides support for NDI using the Net 1 and 2 inputs and Network output. and may be downloaded from the NewTek website.

The upcoming TriCaster Advanced Edition IP version offers a complete, end-to-end, NDI and IP based workflow on every input and output.

A.1.4 OTHER TRICASTER MODELS

NDI has not been extended to other TriCaster models at the present time, but may be added in the future.

A.1.5 NEWTEK TALKSHOW

The TalkShow version 1-2 update (or better) available from the NewTek website adds full NDI support.

CREDITS

Acknowledgments: Tim Jenison, Jim Plant

Engineering: Andrew Cross, Alvaro Suarez, Brian Brice, Cary Tetrick, Charles Steinkuehler, Dan Fletcher, Gil Triana, Greg Heine, James Killian, Jan Uribe, Jarrod Davis, Jeremy Brosius, Jeremy Wiseman, John Perkins, Karen Zipper, Kevin Rouviere, Kirk Morger, Mahdi Mohajer, Masaaki Konno, Menghua Wang, Michael Joiner, Michael Watkins, Mike Murphy, Nathan Kovner, Naveen Jayakumar, Ryan Hansberger, Shawn Wisniewski, Steve Bowie, Troy Stevenson, Zack Lounsbury

Additional thanks to: NewTek Marketing, Sales, Business Development, Customer Support, Training and Development, and Operations

Past and Present Contributors and Friends: (Past and Present):
Eugene Kosarovich, Joe de Max, John Powell, Kevin Nations, Kris Gurrad, Wendell 'Wink' Friesen

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 VMC1 STREAM, TriCaster, 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 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 IsoCorder, ProTek, ProTek Care, ProTek Elite, iVGA, SpeedEDIT, IsoCorder, LiveText, DataLink, LiveSet, TriCaster Virtual Set Editor, Virtual Set Editor Advanced Edition, TriCaster VSE, TriCaster VSE Advanced Edition, LiveMatte, TimeWarp, VT, VT[3], VT[4], V[T5], 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.

NDI™ for Adobe® Creative Cloud®

NDI is a trademark of NewTek Inc.
Copyright © 1990-2017 NewTek Inc. San Antonio TX USA