www.aver.com

AVer PTZ310/330/N and TR311HN/333 Camera Integration with TriCaster and NDI

Steps to integrate the PTZ and New TR Cameras with NewTek TriCaster and NDI (October 2020)

AVer Pro-AV has high quality image Cameras (PTZ310/330/N and TR311HN/333) that will integrate with NewTek video workflows for peak performance and ease of use. We will show how to configure the PTZ Camera with the NewTek TriCaster platform, focusing on the NDI (Network Device Interface) video protocol; the AVer PTZ310N/330N and TR311HN/333 cameras support this NDI protocol.

NewTek systems are used worldwide by broadcasters, sports leagues and teams, educators, houses of worship, live event producers, web-based talk shows, and more than 80% of the U.S Fortune 100. They have IP video workflows with the NewTek IP Series and NDI. You can go to https://www.ndi.tv/ to learn more about NDI or download the NDI Virtual Tools application if needed.

NDI Minimum System Hardware Requirements:

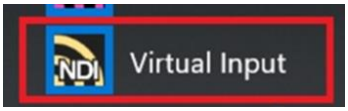
- 64-bit Microsoft® Windows 7 operating system (OS) or better
- Intel i3 or i5 (2.8GHz) Sandy Bridge CPU (Quad/Six core) or better with integrated GPU (NVIDIA discrete GPU, with 2GB video memory or better recommended)
- 8GB system memory, minimum
- Gigabit connection or better
- Display with screen resolution of 1024 x 768 or higher *Faster CPU recommended to support more video streams or higher resolutions*

Overview of NDI use with AVer PTZ and TR Cameras

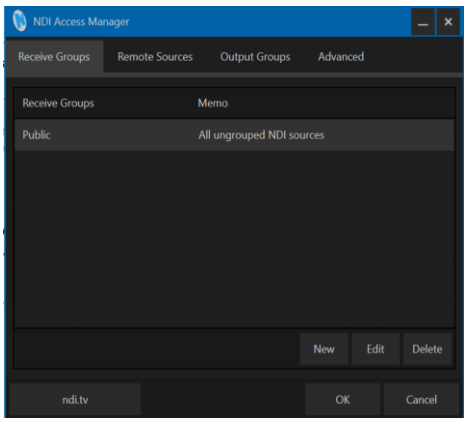
NDI offers several options to broadcast, connect, stream, view, video over 1Gbit/s IP networks. NewTek offers (for free) **NDI 4 Tools** which has 4 main functions for use with AVer cameras, they are:

- NDI Studio Monitor

- NDI Virtual Input



- NDI Access Manager (Routing Control)



- NDI PTZ Camera control from Studio Monitor

We will not go into the installation or overview of each individual component of the NDI 4 Tools software; instead we will cover each as needed while integrating with the TriCaster.

NDI Bandwidth

The following table is intended as a guide for calculating bandwidth needs based on video resolutions and frame rates. Each reference stream includes 16 channels of audio.

***Note:** Information provided by NewTek NDI Technical brief.

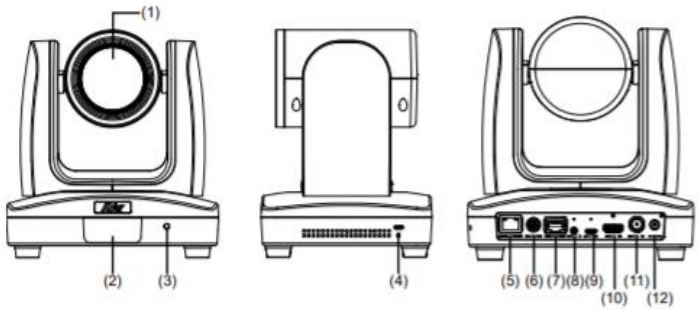
Example NDI video stream	Approximate bandwidth required
1 x UHDp60 video stream	250 Mbps
1 x UHDp30 video stream	200 Mbps
1 x 1080p60 video stream	125 Mbps
1 x 1080i60 video stream	100 Mbps
1 x 720p60 video stream	90 Mbps
1 x SD video stream	20 Mbps

Table 1. Bandwidth Requirements. The approximate bandwidth required per NDI video stream for common video resolutions and frame rates.

AVer PTZ310N/330N Camera Overview

The AVer PTZ330N NDI PTZ Live Streaming Camera is the latest camera with NewTek NDI® integrated. It combines both standard SDI and HDMI connections as well as Ethernet/NDI network connectivity for HD video streaming, recording, and broadcasting. The PTZ330N can output HD video and audio while receiving control signal and power over a single connection.

Overview



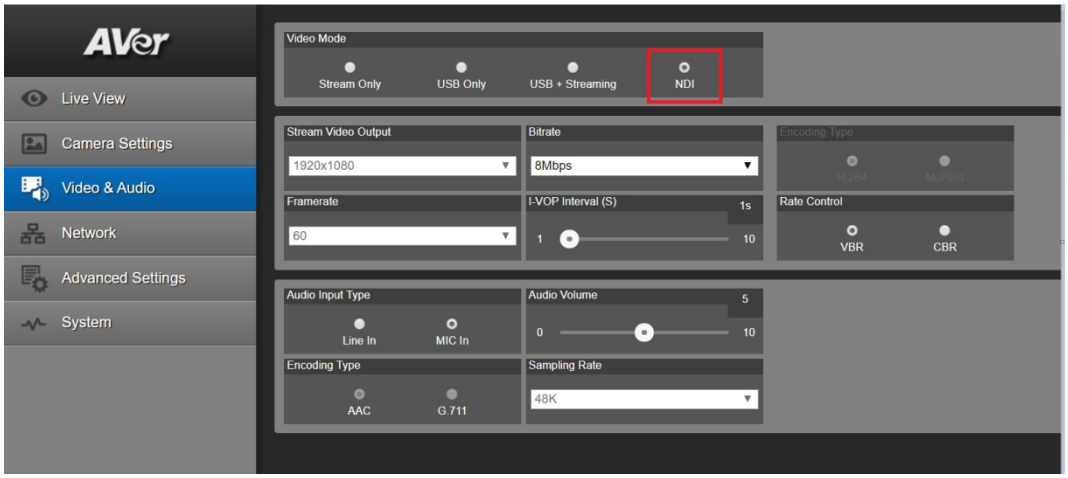
(1) Camera lens
(2) IR sensor
(3) Power indicator
(4) Kensington lock
(5) PoE+ port
(6) RS232 port
(7) RS422 port
(8) Audio IN
(9) micro-USB port
(10) HDMI port
(11) 3G-SDI port
(12) DC Power jack

AVer PTZ310N/330N Camera Video Mode

Before proceeding, we need to verify that the PTZ310N/330N camera is setup for NDI, if not; there will be no NDI output.

1. Use the WebLogin or Camera remote and go to the "*Video & Audio*" settings, verify that "*Video Mode"* has the "*NDI*" radio button selected.

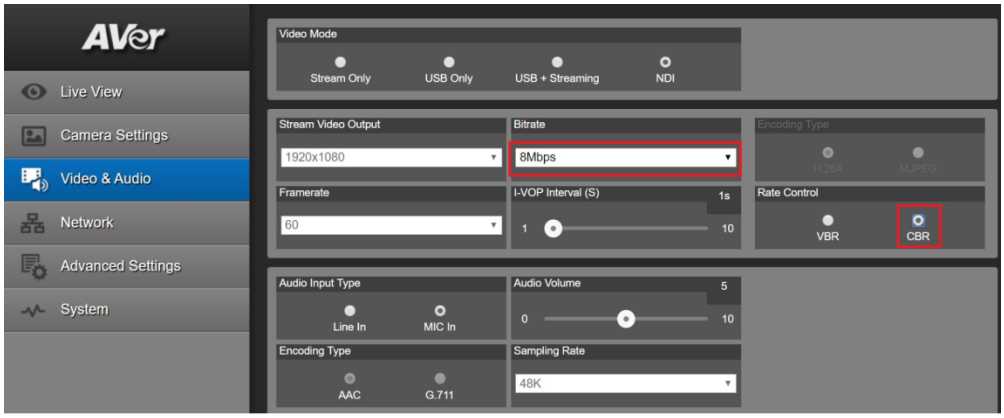
***Note:** The camera will need to re-boot when changing to/from NDI video mode.



***Note:** The STREAM Video Output, Framerate, Encoding type, and Sampling Rate settings are only for viewing, they are not adjustable in NDI mode. The NDI native video resolution is 1920x1080 /60P. The PTZ Camera will have an SDI/HDMI output in ALL modes.

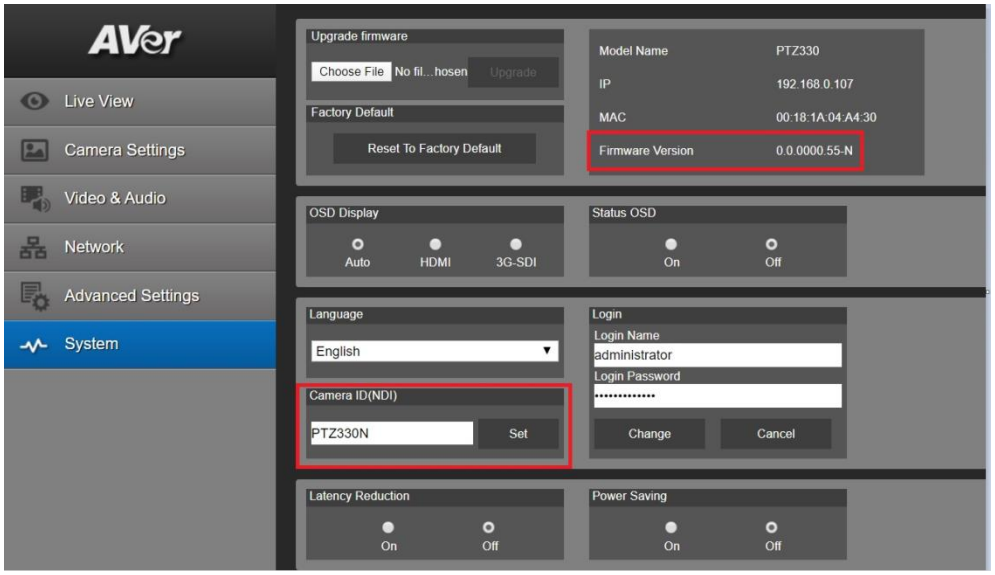
Video Standard -->	Stream Only (Various)	USB Only (Various)	USB + Streaming (Various)	NDI (1080p/60)
SDI Output	✓	✓	✓	✓
HDMI Output	✓	✓	✓	✓
USB Output	x	✓	✓	x
RTSP Output	✓	x	✓	✓

2. The Rate Control setting should be set to CBR, there have been better results seen using this option.



3. Setting the Bitrate to 8Mbps is also recommended, but you may see different results based on your network with other settings.

4. In the *System* page you can set the identity name *Camera ID (NDI)* for display on the NDI interface. After choosing your name press “Set” to make the change. ***Note**: A reboot of the camera is necessary for the name change. The firmware version can also be verified from the *System* page.



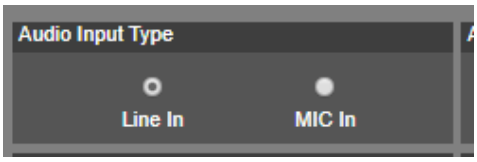
5. The following characters can be used for the Camera ID description, there is a limit of 10 characters for the name.

Numeric characters	0123456789
Alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	! @ # $ % ^ & *( ) , . /\ ; :" ' + = < > ? [ ] { } | - _ ` ~ \ /

NDI Audio Settings

Before connecting to the TriCaster, verify that the Audio and Video can be recorded using the NDI *Studio Monitor* Tool.

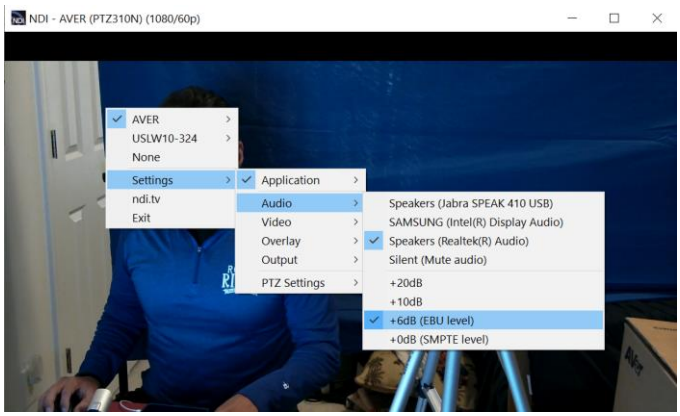
1. Using the PTZ camera Audio (In) connection, set the Audio Input Type to *Line-In*.



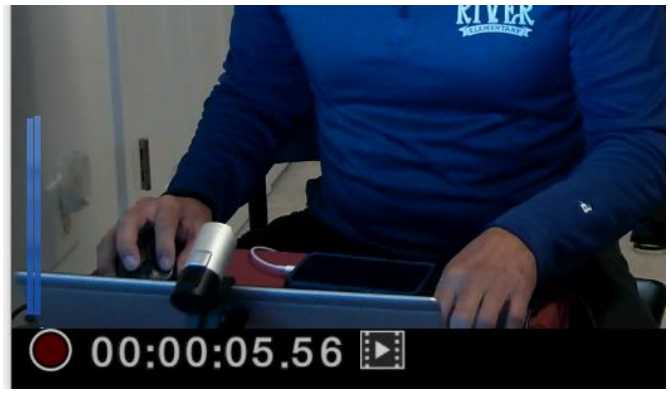
MIC-In: Use a 3 to 4 MIC-In cable to connect the camera and MIC-In device (microphone). 50mVrms (max.); supplied voltage: 2.5V

Line In: Line Input level is 1Vrms (max.)

2. Select the Audio Settings in the NDI Monitor tool to a level where audio is being captured; you may need to "tweak" the level to get a good level.
3. In the example below we needed to adjust level to +6dB (EBU Level) to get audio recorded through the NDI Monitoring tool then played through VLC Media Player (3.0.8).



4. You should also see blue "Audio bars" in the lower left corner of the NDI display indicating an audio signal is being received.



5. Next, select the red "record" circle to begin recording.

NDI Audio Settings (continued)

6. Next, select the red “record” circle again to end the recording.
7. Next, select the “film” icon and will take you to the recording directly. The recorded video will be in the “*C:\Users\Dave\Videos*” folder in Windows.
8. Use VLC or some other player that supports NDI.
9. This concludes the quick test to verify that Audio/Video is being recorded and played.

AVer PTZ 310N/330N Camera integration with NewTek TriCaster NDI

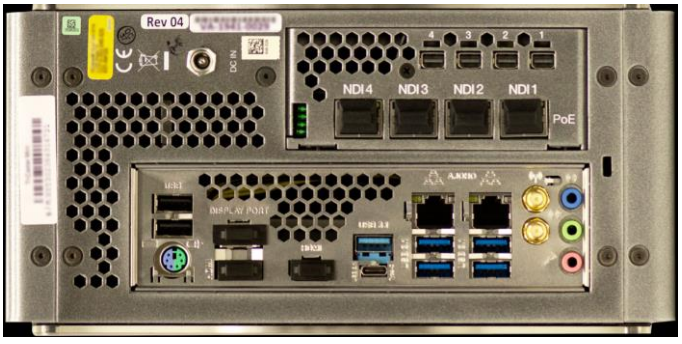
The following are the steps captured for the TriCaster Mini NDI, but the same should be true with the other models.

The NewTek TriCaster comes in 3 different models:

- TriCaster TC1 (4K UHD)
- TriCaster T410 Plus (Rack Mount)
- TriCaster Mini (Portable Desktop).

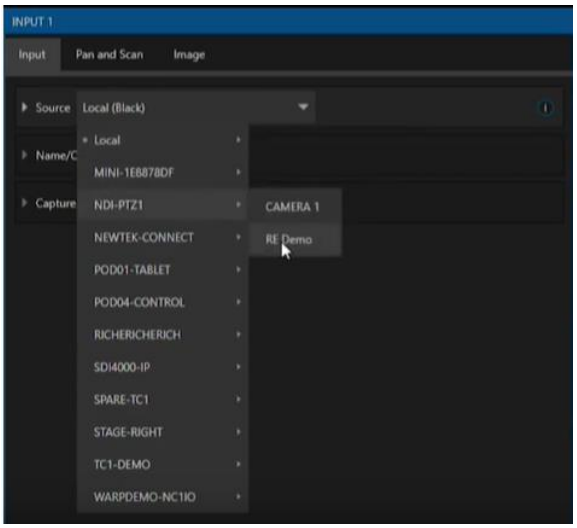
***Note:** The TC1 and T410 do not have PoE+ connections on the back like the Mini does, this means the Network connection would happen through a switch/router that these models are on and power would be supplied through the camera AC adaptor.

1. On the back of the TriCaster Mini there will be (4) NDI RJ-45 (PoE+) connections, locate an available port and connect to the AVer PTZ camera if not already plugged in.



AVer PTZ 310N/330N Camera integration with NewTek TriCaster NDI (continued)

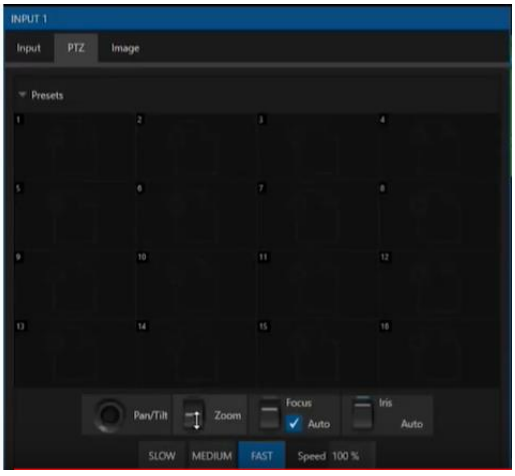
2. Next, once the camera has fully powered up go to the Mini Interface and open *“Input 1”*.



3. Next, you should now be able to select the AVer PTZ camera displayed as “PTZ310N” or “PTZ330N”.

4. Next, once selected you should have video being displayed in the *“INPUT 1”* display of the TriCaster.

5. Next, select the PTZ tab to verify control of the AVer PTZ camera.

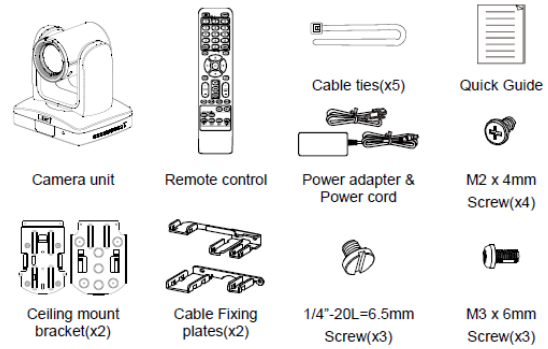


6. This concludes the AVer PTZ-NDI series camera integration with NewTek TriCaster NDI.

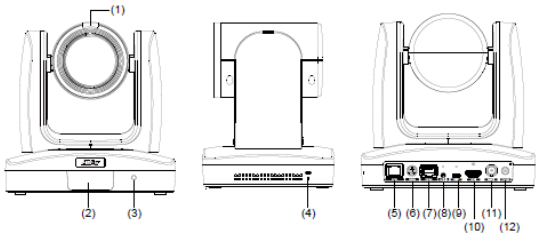
AVer TR311HN/333 Camera Overview

The AVer New camera series, TR311HN, 311, 313, and 333 Live Streaming Camera is the latest camera with NewTek NDI® integrated. It combines both standard SDI and HDMI connections as well as Ethernet/NDI network connectivity for HD video streaming, recording, and broadcasting. The TR311HN camera can output HD video and audio while receiving control signal and power (PoE+) over a single connection.

Package Contents



Overview



(1) Tally Lamp
(2) IR Sensor
(3) Power Indicator
(4) Kensington Lock
(5) PoE+ IEEE 802.3AT
(6) RS232 Port
(7) RS422 Port
(8) Audio In
(9) USB 3.0 Port (Type C)
(10) HDMI Port
(11) 3G-SDI Port
(12) DC Power Jack

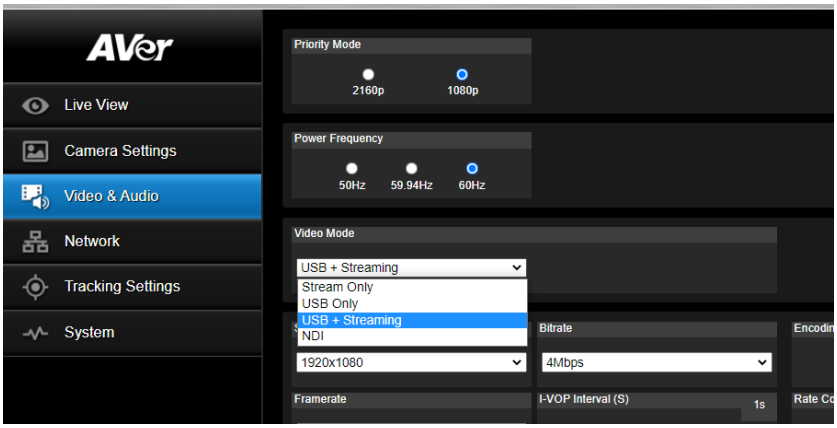
AVer TR311HN/333 Camera Video Mode

Before proceeding, we need to verify that the TR311HN/333 camera is setup for NDI, if not; there will be no NDI output.

***Note:** The TR311HN cameras come with NDI activated, the TR311, 313, 333 cameras are upgradeable to NDI with a license key.

1. Use the WebLogin or Camera remote and go to the "*Video & Audio*" settings, verify that "*Video Mode"* has the "*NDI*" radio button selected.

***Note:** The camera will need to re-boot when changing to/from NDI video mode.

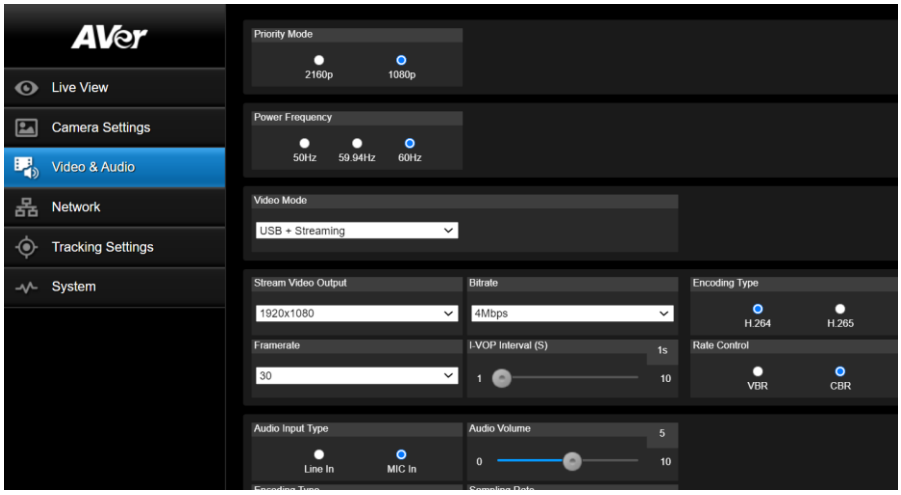


***Note:** The STREAM Video Output, Framerate, Encoding type, and Sampling Rate settings are only for viewing, they are not adjustable in NDI mode. The NDI native video resolution is 1920x1080P /60, but is adjustable in the TR camera, 30fps / 60fps etc. The TR Camera will have an SDI/HDMI output in ALL modes.

Video Standard -->	Stream Only (Various)	USB Only (Various)	USB + Streaming (Various)	NDI (1080p/60)
SDI Output	✓	✓	✓	✓
HDMI Output	✓	✓	✓	✓
USB Output	x	✓	✓	x
RTSP Output	✓	x	✓	✓

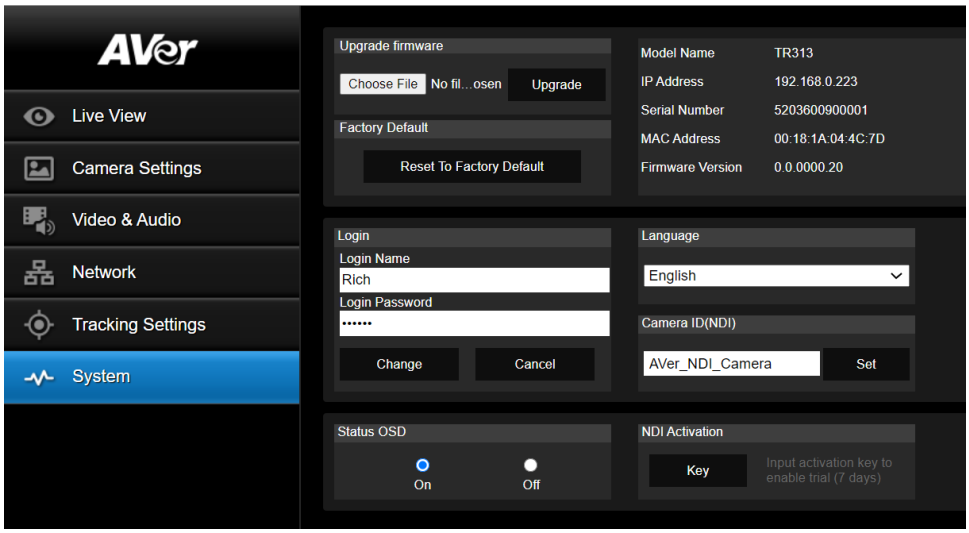
AVer TR311HN/333 Camera Video Mode (continued)

2. The Rate Control setting should be set to CBR, there have been better results seen using this option.



3. Setting the Bitrate to 8Mbps is also recommended, but you may see different results based on your network with other settings.

4. In the *System* page you can set the identity name *Camera ID (NDI)* for display on the NDI interface. After choosing your name press "Set" to make the change. ***Note**: A reboot of the camera is necessary for the name change. The firmware version can also be verified from the *System* page.



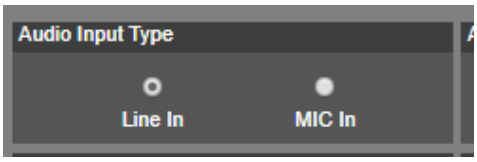
5. The following characters can be used for the Camera ID description, there is a limit of 10 characters for the name.

Numeric characters	0123456789
Alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	! @ # $ % ^ & *( ) , . /\ ; :" ' + = < > ? [ ] { } | - _ ` ~ \ /

NDI Audio Settings

Before connecting to the TriCaster, verify that the Audio and Video can be recorded using the NDI *Studio Monitor* Tool.

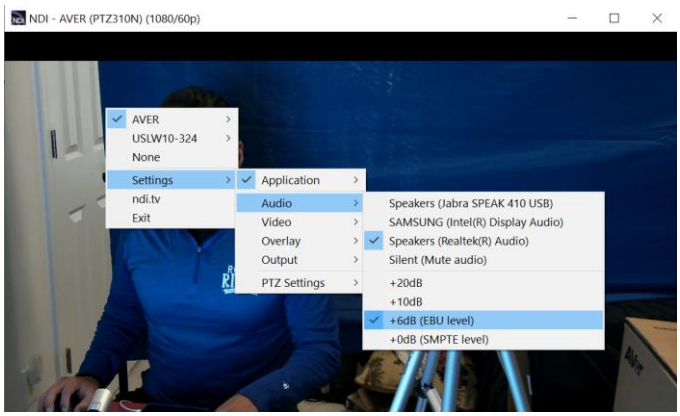
1. Using the PTZ camera Audio (In) connection, set the Audio Input Type to *Line-In*.



MIC-In: Use a 3 to 4 MIC-In cable to connect the camera and MIC-In device (microphone). 50mVrms (max.); supplied voltage: 2.5V

Line In: Line Input level is 1Vrms (max.)

2. Select the Audio Settings in the NDI Monitor tool to a level where audio is being captured; you may need to "tweak" the level to get a good level.
3. In the example below we needed to adjust level to +6dB (EBU Level) to get audio recorded through the NDI Monitoring tool then played through VLC Media Player (3.0.8).



4. You should also see blue "Audio bars" in the lower left corner of the NDI display indicating an audio signal is being received.

NDI Audio Settings (continued)

5. Next, select the red “record” circle to begin recording.

6. Next, select the red “record” circle again to end the recording.
7. Next, select the “film” icon and will take you to the recording directly. The recorded video will be in the “*C:\Users\Dave\Videos*” folder in Windows.
8. Use VLC or some other player that supports NDI.
9. This concludes the quick test to verify that Audio/Video is being recorded and played.

AVer TR 311HN/333 Camera integration with NewTek TriCaster NDI

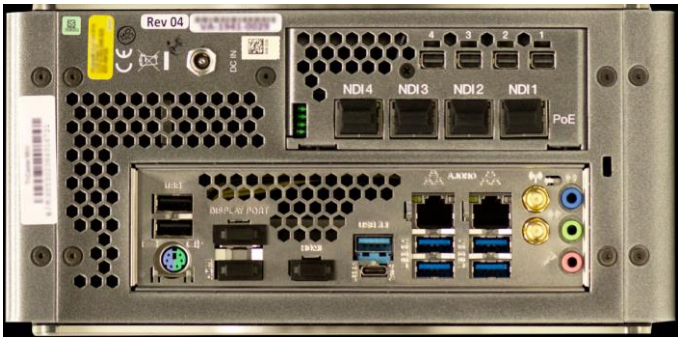
The following are the steps captured for the TriCaster Mini NDI, but the same should be true with the other models.

The NewTek TriCaster comes in 3 different models:

- TriCaster TC1 (4K UHD)
- TriCaster T410 Plus (Rack Mount)
- TriCaster Mini (Portable Desktop).

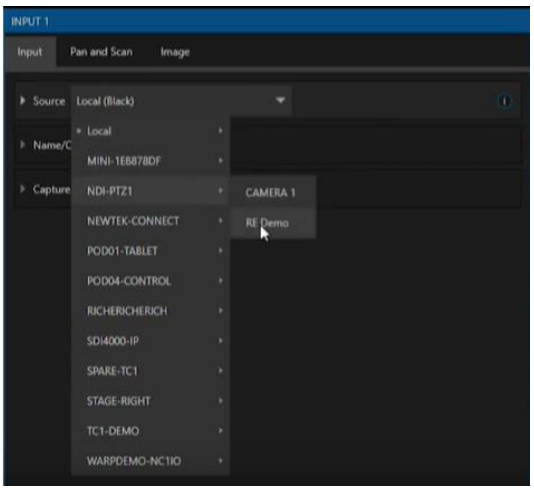
***Note:** The TC1 and T410 do not have PoE+ connections on the back like the Mini does, this means the Network connection would happen through a switch/router that these models are on and power would be supplied through the camera AC adaptor.

1. On the back of the TriCaster Mini there will be (4) NDI RJ-45 (PoE+) connections, locate an available port and connect to the AVer TR camera if not already plugged in.



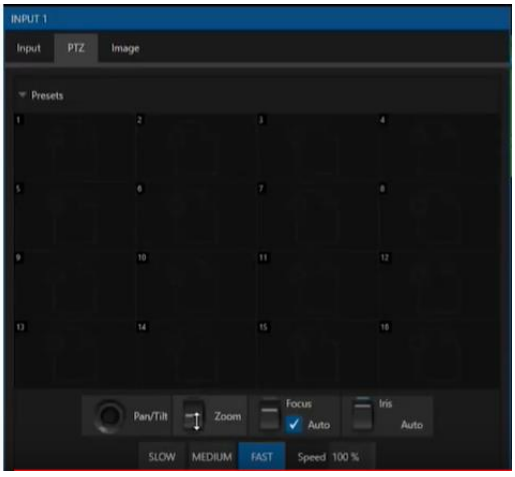
AVer TR 311HN/333 Camera integration with NewTek TriCaster NDI (continued)

2. Next, once the camera has fully powered up go to the Mini Interface and open *"Input 1"*.



3. Next, you should now be able to select the AVer TR camera displayed as "TR311HN" or "AVer_NDI_TR313".
4. Next, once selected you should have video being displayed in the *"INPUT 1"* display of the TriCaster.

5. Next, select the PTZ tab to verify control of the AVer PTZ camera.



6. This concludes the AVer TR-NDI series camera integration with NewTek TriCaster NDI.

Check the AVer Pro-AV Website for additional support documentation.

https://www.averusa.com/pro-av/support/