

AVer PTZ 310N/330N and New TR311HN/333 Camera Integration

with Google Hangouts and NDI

Steps to integrate the Aver PTZ and New TR Cameras with Google Hangouts and NDI protocol (October 2020)

AVer has high quality image Cameras (PTZ310/330/N and TR311HN/333) that will integrate with these workflows for peak performance and ease of use. Current PTZ cameras in the field are not upgradeable to support NDI. We will show the configuration process for the PTZ 310N/330N and TR311HN/333 Camera with the NDI Software. There are some pre-requisites for this to happen, see below.

NDI is a high-performance standard that allows anyone to use real time, ultra-low latency video on existing IP video networks. The PTZ310N or PTZ330N camera has an "N" which designates that the camera has the ability to integrate with the NewTek NDI protocol. You can go to https://www.ndi.tv/ to learn more about NDI or download the NDI Virtual Input application if needed.

• AVer PTZ310N/330N Camera and accessories.



- Chrome Browser, version 79.0.3945.xxx and later.
- NDI Tools 4.1, approx. 150MB in size.

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 New TR cameras

NDI offers several options to broadcast, connect, stream, view, video over 1Gbit/s IP networks. There are 4 main functions from NDI Tools for use with AVer cameras, we will not discuss each in great detail, but only as they are needed to setup the PTZ camera, they are:

- NDI Studio Monitor
- NDI Virtual Input
- NDI Access Manager (Routing Control)
- NDI PTZ Camera control from Studio Monitor

NDI 4 Tools Installation

- 1. If NDI 4 Tools software is not installed, go to https://www.ndi.tv/ to download and install.
- 2. From the NDI website, select NDI->NDI Tools, and then scroll down to NDI Tools 4.x to

download.



NDI TOOLS 4.1 AVAILABLE NOW

3. Next, select "NDI Tools for Windows" download.



DOWNLOAD

NDI 4 Tools Installation (continued)

4. You will be asked to register for the Download, Name, email, etc. then you should see the following to continue with the download.



5. Once installed, you should have the following on your Windows Start Menu:



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 PTZ310/330N Camera Video Mode

1. Before proceeding, we need to verify that the PTZ310N/330N camera is setup for NDI, use the WebLogin and go to the "Video & Audio" settings, verify that the "NDI" radio button has been selected for Video Mode.

AV er	Video Mode	•	•	0		
Live View	Stream Only	USB Only	USB + Streaming	NDI		
Camera Settings	Stream Video Output		Bitrate		Encoding Type	
Video & Audio	1920x1080 Framerate	•	8Mbps I-VOP Interval (S)	15	H.264	MJPEG
Retwork	60	۲	I 1 O		0 O VBR	O CBR
Advanced Settings	Audio Input Type	_	Audio Volume	5		
-vv- System	Line In	O MIC In	0) 1	0	
	Encoding Type		Sampling Rate			
	AAC	G.711	48K	,		

***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.

Video Standard>	Stream Only (Various)	USB Only (Various)	USB + Streaming (Various)	NDI (1080p/60)
SDI Output	✓	×	\checkmark	\checkmark
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.

AV er	Video Mode					
Live View	Stream Only	USB Only	USB + Streaming	O NDI		
Camera Settings	Stream Video Output		Bitrate		Encoding Type	
Video & Audio	1920x1080		8Mbps	•	H 264	MJPEG
Han Network	Framerate 60		1 •	1s 10	Rate Control	CBR
Advanced Settings	Audio Input Type	_	Audio Volume	5		
-v- System	Line In	O MIC In		• 10		
	Encoding Type		Sampling Rate			
	AAC	G.711	48K	*		

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

AVer PTZ310/330N Camera Video Mode (continued)

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.

AV er	Upgrade firmware Choose File No filhosen Upgrade	Model Name	РТZ330
O Live View	Factory Default	IP MAC	192.168.0.107 00:18:1A:04:A4:30
Camera Settings	Reset To Factory Default	Firmware Version	0.0.0000.55-N
Video & Audio	OSD Display	Status OSD	_
Handreich Network	o ● ● Auto HDMI 3G-SDI	● On	O Off
Advanced Settings	Language	Login	
- v- System	English T	Login Name administrator	
	Camera ID(NDI)	Login Password	
	PTZ330N Set	Change	Cancel
	Latency Reduction	Power Saving	
	On Off	On	O Off

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

AVer PTZ Camera Audio Settings

Before connecting to the Microsoft Teams environment, 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. Next, we will discuss how to test that NDI audio/video is being received and recorded using *NDI Studio Monitor*.

NDI Studio Monitor

Using NDI Studio Monitor is a quick way to verify that the AVer PTZ camera is outputting NDI video and audio.

1. Go to Windows Start Menu, select NDI's Studio Monitor.



2. Next, the NDI Studio Monitor window will open, it may display AVer video or may display NDI's default video of "None".



NDI Studio Monitor (continued)

3. Next, to view AVER video, select the Menu box displayed on upper left, then select "AVER PTZ330N". You can also "right-click" anywhere within the window to access the menu.



4. Next, you should now be viewing the AVER PTZ330/310N video as a source and it should also be displaying the Video Standard (1080/60p) from AVer Camera.



5. At this point, you can close the window and have verified NDI video from PTZ camera is working.

AVer PTZ Camera NDI Audio

Once we have verified that video is working properly, we need to verify that audio is also being captured.

1. 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).



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



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



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

NDI Virtual Input

Using the NDI Virtual Input it gives you the ability of supplying a high quality video source to Hangouts or Skype meeting, (i.e. from PTZ330N), here is how to configure a "Virtual Input" from NDI. This "Virtual Input" will be the video *Source* for Google Hangouts.

1. Go to Windows Start Menu, select NDI's Virtual Input application.



2. Next, it will open and place an icon on your System Tray.



3. Next, Right-Click on the NDI icon, you should have the ability to select AVER->PTZ330.

AVER	>	PTZ330N
None		
Audio	>	
ndi.tv		115% 🗩 🚽
Exit		
6	$) \land $	

4. Next, verify that your selection is for AVER->PTZ330N, Right-click on icon to verify check marks are there.



5. This concludes setting up the AVer PTZ camera as a Virtual Input for NDI integration.

Microsoft OS Settings

Settings

- 1. One of the very first things to check is if Microsoft has permission to access your camera and microphone. There are instances where the App will not detect your camera if left disabled in your PC's settings.
- 2. Press the *Windows Key* and *I* key together. This will bring up the *Windows Settings* page.

- 🗆 🗙

- Personalization Apps Uninstall, defaults, optional features Background, lock screen, colors AF Time & Language Q Accounts Your accounts, email, sync, work, other people Speech, region, date Gaming Game bar, captures, broadcasting, Game Mode Ease of Access Narrator, magnifier, high contrast Search O Cortana Find my files, permissions Cortana language, permissions, notifications А Privacy Update & Security Location, camera, microphone Windows Update, recovery, backup
- 3. Next, look for the *Privacy* setting and select it.
- 4. Next, from the left sidebar, under *App permissions* click on *Camera*.

← Settings	×
û Home	Camera
Find a setting	Allow access to the camera on this device
Privacy	If you allow access, people using this device will be able to choose if their apps have camera access by using the settings on this page. Denying access blocks (Microsoft Store apps and most desktop apps from accessing the camera. It does not block. Windrow Hello.
Windows permissions	
티 Activity history	Camera access for this device is on Change
App permissions	
ሔ Location	Allow apps to access your camera
 Camera 	If you allow access, you can choose which apps can access your camera by using the settings on this page. Denying access blocks apps from accessing your camera. It does not block Windows
Microphone	Hello.
Voice activation	On On
Notifications	Some desktop apps may still be able to access your camera when settings on this page are off. Find out why
RE Account info	Choose which Microsoft Store apps can access
۹ ^۹ Contacts	your camera

- 5. Next, on the *Camera* page, you want to make sure the option *Allow Apps to access camera* is turned *On*.
- 6. You also want to make sure that under *Choose which app can access your camera that Microsoft Teams* is turned *On.*
- 7. Now Microsoft Teams will appear here in this list if you have the Microsoft Teams desktop app installed.

Google Hangouts configuration

Once the AVer PTZ310/330 Camera has been connected and verified via NDI protocol we can now configure Google Hangouts to view this camera source.

1. Go to your Goggle Hangouts account and select Video Call.



2. Next, a new window will open and a text box to *Invite people* will appear. You can add a name or email, *Copy Link To Share* or close the window. Close the window for now.



3. Next, select the *Settings Gearbox* located in the upper right corner of the video screen.



4. Next, a new window will appear, under the *Video* selection look for *NewTek NDI Video* and select it.



5. Next, at this point you should have PTZ camera NDI video on your screen.

Google Hangouts configuration (continued)

6. Next, select the Microphone and Speakers that will be used.



7. Next, you can click on the invite icon to invite someone to start a session.

** *	
Invite people	×
Sending invite as ri	
Enter a name or email	
COPY LINK TO SHARE	INVITE

8. This concludes the AVer PTZ camera with NDI integration with Google Hangouts.

NDI Access Manager

When there are several video sources available, you will want to control the video sources by limiting the visibility of NDI channels to specific systems. You can organize your NDI channels into groups, choose which groups are available to your device, and select which groups can receive your NDI channels.

1. Go to Windows Start Menu; select NDI's Access Manager Application.



2. Next, you should be seeing the following window.



3. Next, select the Remote Sources tab, then select "New", under "Type" select NDI Source.

NDI Access Manager					
Configure Remote NDI Source					
Туре	NDI Source				
Device IP Address					
Local Device Name	NDISource				
Local Device Channel	Chan 1				
			Cancel		

NDI Access Manager (continued)

4. Next, enter the Device IP Address, Local Device Name, and Local Device Channel name. If you had multiple cameras, you would add each one of those here.

NDI Access Mai	nager				-	×
Receive Groups	Remote Sources	Output Groups	Advance	ed		
IP Address	Local NDI N	lame	Туре			
192.168.0.107	NDISource	PTZ330	NDI So	urce		
			New	Edit	Delete	
			New	Edit	Delete	
ndi.tv			ОК		Cancel	

5. Next, go back to the Receive Groups tab; you can create a group there such as "Studio", "Editors", "Public".

🚯 NDI Access Ma	nager				—	×
Receive Groups	Remote Sources	Output Groups	Advan	ced		
Receive Groups		Memo				
Public		All ungrouped NDI sou	urces			
Studio		AVer Production came	ras			
			New	Edit	Delet	e
ndi.tv			OK		Cancel	

6. For detailed information on Access Manager consult the NDI website, https://ndi.tv/

PTZ Camera Control from NDI Studio Monitor

The NDI Studio Monitor allows you to view or display any number of NDI video sources across the network, such as the AVer PTZ310/330N camera. There is also remote control of PTZ, recording, and configuration of an applicable source. We will discuss the NDI PTZ control of the AVer PTZ310/330N camera.

1. Go to Windows Start Menu, select NDI's Studio Monitor.



 Next, the NDI Studio Monitor window will open, it may display AVer video or may display NDI's default video of "None". If "None" is displayed, select the Menu box (or right-click on display), then select AVER->PTZ330N as the source.



3. You should now be seeing the PTZ310/330 video, to activate the controls, move your mouse over the window.



PTZ Camera Control from NDI Studio Monitor (continued)

4. The NDI AVer camera controls are Pan, Tilt, Zoom, Manual Focus, Automatic Focus, and Position Presets.



- Initially there will *not* be a blue dot in any of the controls, move your mouse over to the Pan/Tilt control area, and then left click hold. You will now have a "Joystick" type control of the AVer camera. *Note: Selecting the Up/Down, Left/Right arrows do nothing.
- 6. Move your cursor over the Zoom control, left click hold, you can control the Zoom of the camera.
- 7. To create a "Preset", adjust the camera to the preferred position, then select "Store" followed by one of the 9 presets.



8. This concludes the AVer PTZ310N/330N camera integration with NDI Studio Monitor.

TR 311HN / 311 / 313 / 333 Camera and Accessories





Camera	TR310	TR311HN	TR311	TR313	TR333
Zoom	10X Optical, 12X digital	12X Optical, 12X digital	12X Optical, 12X digital	12X Optical, 12X digital	30X Optical, 12X digital
Max Resolution	1080@60fps	1080@60fps	1080@60fps	2160@30fps	2160@30fps
Outputs	IP / HDMI / USB	IP / HDMI / USB	3G-SDI / IP/ HDMI / USB	3G-SDI / IP / HDMI / USB	3G-SDI/ IP / HDMI / USB
Streaming	RTMP / RTSP	RTMP / RTSP / NDI	RTMP / RTSP / Upgrade to NDI with license key	RTMP / RTSP / Upgrade to NDI with license key	RTMP / RTSP / Upgrade to NDI with license key
Auto Tracking	People Tracking (half or full body), Zone Tracking	People Tracking (half or full body), Zone Tracking	People Tracking (half or full body), Zone Tracking	People Tracking (half or full body), Zone Tracking	People Tracking (half or full body), Zone Tracking
PoE+	Yes	Yes	Yes	Yes	Yes
TAA Compliant	Yes	Yes	Yes	Yes	Yes
WDR & Tally Light	Yes, <mark>No Tally Light</mark>	Yes	Yes	Yes	Yes

AVer TR311HN/311/313/333 Camera and accessories. •

Package Contents



AVer TR311HN, 311, 313, 333 Camera Video Mode

Before proceeding, we need to verify that the TR311HN / 333 camera is setup for NDI video, use the WebLogin and go to the "Video & Audio" settings, verify that "NDI" has been selected from the drop-down menu.

*Note: The camera will need to re-boot when changing to/from NDI video mode. The TR311HN comes with NDI straight out of the box, the TR311/313/333 camera's can be upgraded to NDI via a license key.

AVer	Priority Mode		
 Live View 	2160p 1080p		
Camera Settings	Power Frequency		
Video & Audio	50Hz 59.94Hz 60Hz		
品 Network	Video Mode		
• Tracking Settings	USB + Streaming Stream Only USB Only		
-v- System	USB + Streaming NDI Bitrate		Encodi
	1920x1080 4Mbps	~	
	Framerate I-VOP Interval (S)	1s	Rate C

*Note: The STREAM Video Output, Framerate, encoding type, and Sampling Rate settings are not adjustable in NDI mode. The NDI native video resolution is 1920x1080P /60, but is adjustable in the TR camera, 30fps / 60fps etc.

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

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

AV er	Priority Mode	
Live View	2160p 1080p	
Camera Settings	Power Frequency	
Video & Audio	50Hz 59.94Hz 60Hz	
몲 Network	Video Mode	
Tracking Settings	USB + Streaming V	
-v- System	Stream Video Output Bitrate	Encoding Type
	1920x1080 ~ 4Mbps	→ ● H.264 H.265
	Framerate I-VOP Interval (S)	1s Rate Control
	30 × 1 🕤	10 VBR CBR
	Audio Input Type Audio Volume	
	Line In MIC In 0	9 10

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

AVer TR311HN, 311, 313, 333 Camera Video Mode (continued)

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.

AVer	Upgrade firmware Choose File No filosen Upgrade	Model Name TR313 IP Address 192, 168, 0, 223
Live View	Factory Default	Serial Number 5203600900001 MAC Address 00:18:1A:04:4C:7D
Camera Settings	Reset To Factory Default	Firmware Version 0.0.0000.20
Video & Audio	Login	Language
器 Network	Login Name Rich	English ~
• Tracking Settings	Login Password	Camera ID(NDI)
System	Change Cancel	AVer_NDI_Camera Set
	Status OSD On Off	Key Input activation key to enable trial (7 days)

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

AVer TR Camera Audio Settings

Before connecting to the Google Meet/Hangouts environment, verify that the Audio and Video can be recorded using the NDI *Studio Monitor* Tool.

1. Using the TR 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.
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1. Go to Windows Start Menu, select NDI's Studio Monitor.



2. Next, the NDI Studio Monitor window will open, it may display AVer video or may display NDI's default video of "None".



NDI Studio Monitor (continued)

 Next, to view AVER video, select the Menu box displayed on upper left, then select "AVER_NDI_Camera". You can also "right-click" anywhere within the window to access the menu.



4. Next, you should now be viewing the AVER TR311HN/333 video as a source and it should also be displaying the Video Standard (1080/60p) from AVer Camera.



5. At this point, you can close the window and have verified NDI video from TR camera is working.

AVer TR Camera NDI Audio

Once we have verified that video is working properly, we need to verify that audio is also being captured.

1. 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).



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



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- 5. Next, select the **I** "film" icon and will take you to the recording directly. The recorded video will be in the "*C*:*Users\Dave\Videos*" folder in Windows.
- 6. Use VLC or some other player that supports NDI.
- 7. This concludes the quick test to verify that Audio/Video is being recorded and played via NDI.