HD-NDI-200/HD3G-NDI-200

Full-HD NDI® HX2 POV Camera



Version 3 AIDA

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NDI® is a registered trademark of Newtek Inc.*

The information within this manual is subject to change at any time without prior notice**

Safety Guide:

1. Before operation, please read all the instructions in the manual carefully. For your convenience, please keep this manual.

2. Ensure the power supply input is within the recommended rate before powering on.

3. Camera power voltage = 12VDC, with a rated currency to 2A.

4. Please keep the power cable, video cable, and control cable safe and out of obstructions.

5. Operational temperature of the camera is between 0-50C / 32F-122F. To avoid damage, do not pour anything inside the camera. Avoid direct sunlight or outdoor environments.

6. Do not remove the camera housing or cover. For service, please contact our support line.

7. Use a dry, soft cloth to clean the camera housing with a neutral cleaning agent when needed.

Packing List:

Check for the items below when opening the package:

- AIDA HD-NDI-200 / AIDA HD3G-NDI-200
- Power Adapter
- Power Adapter International Sockets
- Micro USB Cable
- C/CS Mount Adapter

Quick Start:

1. Ensure that all cable connections are secure before powering on the camera.



*HD3G-NDI-200 will have a 3G-SDI slot instead of HDMI.

2. Test the video either through HDMI/3G-SDI or NDI. The camera will be default resolution of 1080 30p.

Product Highlights:

- Contains a Sony CMOS ISP (1/2.8" progressive CMOS sensor) providing up to 1920x1080 full HD resolution.
- Utilizes the newest NDI[®] HX2 for the lowest latency, quality and compression video over a single network.
- Autodiscover enabled for fast installation over any network.
- Standard 4mm lens for a standard 80 degree HFOV shot.
- Full HD video over HDMI(HD-NDI-200), 3G-SDI (HD3G-NDI-200), RTSP, RTMP, and NDI.
- Fully adjustable camera settings, from White balance, exposure settings, and image parameters.
- Supports PoE: get power and video over one ethernet cord.
- Controllable over RS485 or online web UI.
- Menu based image parameters controllable over breakout cable or web UI.
- Free firmware updates when needed.
- Mountable tripod holes on the top and bottom.
- Audio input in rear portion of the camera for multi-channel TRS stereo audio via NDI[®] HX2 or RJ45 streaming.
- Functional tally light for program, preview, and standby modes. (NDI transmission)

Camera Specs: HD-NDI-200

Video Interface	HDMI (V1.4) RJ-45 NDI® HX2
Sensor	1/2.8" Sony Progressive CMOS Sensor
Lens	4mm Default lens (80 degree HFOV)
Lens Mount	CS Mount (C mount adapter included)
Control Port	RS485, RJ-45 (VISCA over IP), NDI
Network Speed	1000M
Video Encode	H.264/H.265
Bit-Rate Control	Variable Bit Rate, Constant Bit Rate
Video Bit Rate	1024 kbps (min) ~ 20480 kbps (max)
IP Protocol	IP, RTSP, RTMP, VISCA over IP, NDI [®] HX2
POE	Supported (IEEE802.3af)
Minimum Lux	0.01 Lux
White Balance	Auto/Indoor/Outdoor/One Push/ATW/Manual
Exposure	Auto/Manual
Gamma	Supported
WDR	Supported
BLC	Supported
2D/3D NDR	Supported
Audio	TRS Stereo Line In (3.5mm Jack)
Dimensions	LWH 2.13" x 5" x 2.13" (54mm x 127mm x 54mm)

Camera Specs: (CONTD.)

		1920 x 1080	
		60p/59.94p/50/30p/29.97p/25p/24p/23.98p	
		1920x1080	
	HDIVII	60i/59.94i/50i	
		1280x720	
		60p/59.94p/50p/30p/29.97p/25p	
Video		1920x1080	
Format		3~60	
		1280x720	
	IP / NDI HX	3~60	
	(frames)	1024x576	
		3~60	
		620x360	
		3~60	

Camera Specs: HD3G-NDI-200

Video Interface	3G-SDI RJ-45 NDI® HX2
Sensor	1/2.8" Sony Progressive CMOS Sensor
Lens	4mm Default lens (80 degree HFOV)
Lens Mount	CS Mount (C mount adapter included)
Control Port	RS485, RJ-45 (VISCA over IP), NDI
Network Speed	1000M
Video Encode	H.264/H.265
Bit-Rate Control	Variable Bit Rate, Constant Bit Rate
Video Bit Rate	1024 kbps (min) ~ 20480 kbps (max)
IP Protocol	IP, RTSP, RTMP, VISCA over IP, NDI [®] HX2
POE	Supported (IEEE802.3af)
Minimum Lux	0.01 Lux
White Balance	Auto/Indoor/Outdoor/One Push/ATW/Manual
Exposure	Auto/Manual
Gamma	Supported
WDR	Supported
BLC	Supported
2D/3D NDR	Supported
Audio	TRS Stereo Line In (3.5mm Jack)
Dimensions	LWH 2.13" x 5" x 2.13" (54mm x 127mm x 54mm)

Camera Specs: (CONTD.)

		1920 x 1080	
	3G-SDI	60p/59.94p/50/30p/29.97p/25p/24p/23.98p	
		1920x1080	
		60i/59.94i/50i	
		1280x720	
		60p/59.94p/50p/30p/29.97p/25p	
Video		1920x1080	
Format		3~60	
		1280x720	
	IP / NDI HX	3~60	
	(frames)	1024x576	
		3~60	
		620x360	
		3~60	

OSD Menu: (CONTD.)

- 1. To access the OSD menu, please use the OSD controller on the breakout cable.
- 2. Enter the menu by pressing the OSD control button once.
- 3. Navigate through the menu by tilting the joystick up, down, left or right to manipulate the menu.
- 4. To exit, go back to the main menu and press the OSD control button once.

SYSTEM	Language	Select Language (English only)	Default: English
	Protocol	VISCA: Serial and IP default	Default: VISCA
	Address	Select VISCA address ID	Default: 1
	Baudrate	Select the VISCA baudrate	Default: 9600
	Return	Return to previous menu	
EXPOSURE	EXP. Mode	Choose between auto and manual exposure settings	Default: AUTO
	Shutter	Change shutter speed under manual settings only	Default: AUTO Manual: 1/100
	Gain	Change gain under manual settings only	Default: AUTO Manual: 0
	DC IRIS	Allow for DC IRIS Lens compatibility	Default: On
	Flick	Allows for adjustment of flickerless option	Default: 50hz
	Backlight	Allows for enabling of backlight to compensate for low light	Default: OFF
	Gamma	Allows for changing gamma settings	Default: 0
	Return	Return to the previous menu	

OSD Menu: (CONTD.)

	_	Auto/Indoor/Outdoor/Onepush/	Default:
	WB Mode	ATW/Manual/Sodium/Flourescent	AUTO
	R_Gain	Adjust red gain under manual settings	Default:52
IMAGE	B_Gain	Adjust blue gain under manual settings	Default:58
	Defog	Allows adjustment against hazy objects	Default: OFF
	Return	Return to previous menu	
	2D NR	When enabled, image noises and sharpness are reduced	Default: OFF
	3D NR	When enabled, less image reduction happens	Default: AUTO
	Sharpness	Set the level for sharpness	Default: 3
QUALITY	Contrast	Set the level for contrast	Default: 8
	Saturation	Set the level for Saturation	Default: 8
	Bright	Set level for brightness	Default: 8
	D_WDR	Enables control of WDR	Default: OFF
	Return	Return to previous menu	
CTRL	Mirror	Mirrors the image across the Y plane	Default: OFF
	Flip	Mirrors the image across the X plane	Default: OFF
	D/N Mode	Enables the night shutter mode for low light situations	Default: DAY
	Gain Limit	Allows to set limit on amount of light that enters the camera	Default: 128
FORMAT	Resolutions	Allows for the changing of resolutions. Scroll down for more options.	Default: 1080 30p
	Return	Return to previous menu	

OSD Menu: (CONTD.)

	DHCP	Enable or disable DHCP	Default: OFF
NETWORK	Address	Set the IP address of the camera	Default: 192.168.1.188
	Netmask	Set the netmask of the camera	255.255.255.0
	Gateway	Set the gateway of the camera	192.168.1.001
	Return	Return to the previous message	
RESET	Cam Reset	Reset all Image parameters	Default: RESET
	All Reset	Factory reset the camera (please give the camera a moment to reboot)	Default: RESET
	Return	Return to the previous menu	
INFO	FW Ver	Use this when referring to support	
	Info	Use this to quickly glance over the cameras IP settings, as well as resolution and visca settings.	
	Return	Return to previous menu	

Web Settings:

The camera web interface supports most major browsers such as Chrome, Firefox, IE, Safari, Opera, etc.

1. Login

Open your desired browser and in the address bar, please type the camera's default IP address: 192.168.1.188. (If you are unable to connect, please locate the IP address under the INFO menu, and make sure your device is connected to the same network as it)

You will be prompted with the following screen. The default credentials are:

Username: admin

Password: admin



2. Realtime Preview

When logging in the first time, you will see the real-time preview:



Note that the preview is trailing around 1-2 seconds in real-time. This should only be used as a preview screen to see what the camera is seeing, perfect for determining if changes need to be done.



Clicking the settings tab will lead you to the settings menu of the camera as seen below:

3. Camera Parameters

On the top of the web UI are tabs you can use to change the camera's image parameters.



Preview – The main tab to see a preview of the camera

Exposure – This tab can be used to adjust the exposure of the camera.



- Exposure Mode: Have the camera automatically alter the exposure based on current conditions, or allow for manual change.
- DC-IRIS: The camera should already automatically detect if the DC-IRIS slot is taken, but if your DC-IRIS lens may not work please try turning this ON or OFF.
- Anti-Flicker: In situations of different electrical deliveries, anti-flicker is used to combat against rolling static bars.
- Gain: Adjust the gain of the camera to brighten up the image.
- Shutter: Adjust the electronic shutter to allow more light, or less.

White Balance – This tab is used to help adjust the coloring of the camera.

WB Mode Auto

One Push Manual Red
Manual Blue
Color Temperature
Manual Red
Manual Blue
Man

- WB Mode Change the cameras WB mode state.
 - Auto have the camera automatically adjust (wider, warmer range)
 - Indoor have the camera adjust at a static cooler range
 - o Outdoor have the camera adjust at a static warmer range

- One Push using the one push trigger button, hold a white sheet in front of the camera covering the frame, and click the button. Perfect for matching the white balance amongst other cameras and keeping the colors consistent. Do note that its best to put the camera in its spot to maximize the effectiveness of the trigger push.
- ATW same like AUTO, however it favors more cooler temperatures.
- Manual using blue and red, adjust the white balance freely.
- Temperature using the K scale, adjust the white balance freely.
- One Push Trigger button for one push. Pushing this will automatically set the camera into one push.
- Manual Red / Blue only available when WB is set to manual.
- Color Temperature only available when WB is set to temperature.

Image Effects – This tab houses special features of the camera.

Mirror 🗩 Flip 🗩 BLC 🗢 D-WDR 💿 🛛 🗸 Gamma 💶 💁 Day&Night 🔤 🗸

- Mirror Mirror the image on the Y axis.
- Flip Flip the image over the X axis.
- BLC Enable backlight compensation for the camera perfect for scenarios where there are dark spots. Camera will automatically apply gain to darkened areas, increase detail and appear more lit.
- D-WDR Enable Digital Wide Dynamic Reduction good for scenarios where there is a bright source, and a dark source in one frame. Depending on the level, it will increase the gain on the darker area without effecting the brighter area.
- Gamma Enable a level of gamma, effectively making dark tones in darker images more effectively recognizable from one another.
- Day & Night Enable the IR filter to turn ON (Day) and off (Night).

Image Settings – This tab houses image related settings.

Brightness 💶 🔹 Sharpness 📬 🚢 Saturation 💶 👛 Contrast 💶 👛 2D Noise Reduction 💿 SD Noise Reduction 🜆

- Brightness adjust the overall brightness of the image
- Sharpness adjust the overall sharpness of the iamge
- Saturation adjust the hue of the image
- Contrast adjust the contrast (dark and light) portions of the image
- 2D Noise Reduction allow or disable noise reduction (turning this off may increase noise in the image.)
- 3D Noise Reduction allow or disable spatial noise reduction (turning this off may increase noise in the image.)

Video Settings – This tab allows you to change the HDMI or SDI resolution from the web UI.

Audio Settings – This tab allows you to change the audio settings of the camera.

- Audio state turn this feature on or off.
- Encode mode allow for stereo (LPCM) or mono (AAC).
- SampleRate adjust the sample rate of the cameras embedded audio.
- Volume adjust the incoming volume of the audio source.

4. Video Encode

The video encode tab allows you to change the settings of the camera, from encode mode, resolution and Bitrate. These features change **ALL** IP streams on the camera, so use this as the main resource if you want to alter any IP stream quality.

Stream	Main	Sub
Enable	<u> </u>	
Encode Mode	H.264 🗸	H.264 ~
Profile	MP 🗸	~
RTSP Address	rtsp://192.168.254.222:554/stream/main	rtsp://192.168.254.222:554/stream/sub
Resolution	1920X1080P@60Hz ~	1280X720P@30Hz ~
Bitrate(kbps) (1024-16384)	16384	2048
Bitrate Control	CBR 🗸	CBR ~
l Frame Interval (3-120)	120	30
Confirm	Save Profile Load Profile	

- Stream Main / Sub the camera sends out 2 streams. Main is higher quality and prioritized, while sub is a back-up / important to other streaming protocols.
- Encode Mode choose between H.264 and H.265. These 2 protocols both have strengths and weaknesses, but in laymen terms H.264 requires more bitrate, provides a better image, and adds more latency compared to H.265 (which is the opposite)
- Profile MP (main profile) and HP (high profile) can both be chosen. Overall MP is a better overall fit when it comes to web streaming, but HP can be seen as a better profile if you are looking for quality > latency.
- RTSP address use this to address to connect to the RTSP stream of the camera.
- Resolution use this to change the resolution of the IP stream.
- Bitrate adjust the bitrate of the stream in respect to the bitrate limits.

- Bitrate Control control the color spacing of the camera (CBR vs VBR)
- I-Frame Interval good rule of thumb is to always double your frame rate.

5. NDI[®] / Stream Settings

This tab houses the NDI HX, RTMP and SRT settings of the camera.

Enable NDI [®]		
Device Name	HD-NDI-200	
Channels	FRONT DOOR	
Group	public	
Discovery		
Multicast		
Confirm		

- Enable NDI[®] By default on this enables or disables NDI on the camera.
- Device Name You can change the device name here.
- Channels Change the NDI channel here.
- Group change the NDI group there.
- Discovery allow for NDI discovery.
- Multicast allow for NDI multicast.

RTMP Settings:



How to stream directly to any RTMP service (Youtube, Facebook, etc)

Streaming directly to these sites are easy with the HD-NDI-200's built in encoder! Here's how to stream directly with using your camera to any website that utilizes RTMP for streaming:

Step 1: Find the RTMP URL for the website. For ex: Youtube's is rtmp://a.rtmp.youtube.com/live2 Place it in the Main box and check it on.

Step 2:Next, add a forward slash (/) after the URL if it doesn't have it, and then paste your stream key right after. Remember to never give your stream key to anyone!!

Step 3: Click the save on the bottom right.

Step 4: Complete! If you are embedding audio, audio will also be sent to the stream. Note that the camera will keep sending data to the stream destination until you turn off the stream. Rule of thumb is that if the indicator next to enable is blue, then it is still streaming. If it is a red X, then it is not.

SRT Settings:

SRT		
Mode	Caller 🗸	
Stream	Main	Sub
Enable	-	
IP	0.0.0.0	0.0.0.0
Port	9123	0
Latency(ms)	0	0
Encryption		
Key Length	32 🗸	32 🗸
Passphrase		
streamid		0
Confirm		

These settings allow you to use SRT in either caller, listener or rendezvous. To learn how to send a SRT stream, please refer to our <u>youtube video here:</u>

5. IP/Ethernet Settings

This tab houses the IP settings of the camera.

DHCP		
IP	192.168.254.222	
Netmask	255.255.255.0	
Gateway	192.168.254.1	
DNS		
HTTP Port		
RTSP Port		
RTSP Encrypt		
Visca Over IP	52381	
Confirm		

- DHCP if connected to a router, allow the camera to automatically request an IP address from the router. If on, this may change the cameras IP without you knowing.
- IP the IP address of the camera
- Netmask change the netmask of the camera here.
- Gateway change the gateway of the camera here.
- DNS change the DNS of the camera here.
- HTTP port change the HTTP port here. *WARNING do not change this setting unless you know what you are doing. You may lose access to the web UI if you change it and are unable to reconnect.
- RTSP port change the RTSP port of the camera
- RTSP Encrypt encrypt RTSP
- VISCA over IP change the visca over IP port here.

6. Firmware Upgrades

Use this section to see the version of your camera, as well as upgrade the camera if there are new versions found on our website at aidaimaging.com/support

7. General Settings

In general settings, you can change the credentials of the camera, ntp server, and add a title to your video.

Account		
Account		
Password		
Confirm Possword		
Commin Password		
Confirm		
Time Setting		
	1170	
Time Zone	UIC-7:00 ¥	
NTP Enable		
NTP Update Interval	30m 🗸]
NTP Server Address	us.pool.ntp.org	
NTP Port	80	
Carlor		
Confirm		

- Account
- Account enter the new username credential in this box.
- Password enter the new password credential in this box.
- Confirm Password enter the new password once more to ensure you got it down!
- Time Setting
- Time Zone change to the UTC based time zone here
- NTP Enable allow the camera to sync to a NTP server
- NTP Update Interval how often the camera syncs to the NTP server
- NTP Server Address what IP or address the camera will try to sync to. Note that internet access would need to be available to use NTP.
- NTP port port address of the NTP server.

Title setting allows you to add the time or a custom field of text anywhere on the screen

Title Setting				
	Region 0	Region 1		
	_	_		
Enable				
Main Attach	•	••		
Sub Attach				
Mode	Time 🗸	Custom 🗸		
Custom Text		Front Door		
Transparency (0~100)	100	100		
Horizontal Position	0	0		
(0~255)				
Vertical Position	0	22		
(0~255)				
Text Size	Super 🗸	Big 🗸		
Text Color	White ~	White 🗸		
Background Color	Black ~	Black 🗸		
Confirm				

7. Factory Settings

Lastly, the factory settings tab can help reboot or default the camera.

- Save / Recall used to save a camera state (image tabs only) and recall.
- Simple Reset reset ONLY the image tabs back to default settings.
- Factory default reset ALL settings on the camera back to factory. Good to use when you experience bugs with the camera.
- Standby/Wake used to turn off imaging from the camera, and wake back.
- Reboot used to power reset the camera, WITHOUT losing settings.

VISCA Control:

The HD-NDI-200/HD3G-NDI-200 are able to be controlled via RS485 VISCA or VISCA over IP.

To setup RS485, please locate the RS485 terminal block on the breakout cable.

To setup VISCA over IP, please use the RJ45 port and connect it to your software or hardware that helps control camera parameters. Here are some specs on controlling the camera over IP:

Control Port: RJ-45 Gigabit LAN

IP Protocol: IPv4

Transmission Protocol: TCP/UDP

IP Address: Default (192.168.1.188) Check OSD menu for more info

Port Address: 52381

Confirm send/transmission control: Depends on software

What is VISCA over IP?

VISCA commands are the communication between the controller and the camera equipment. These commands are sent via UDP on the network. Since UDP transmission isn't that stable, a couple of steps must happen before a setting is executed. The controller first sends out a VISCA command. The camera equipment then receives the VISCA command and returns that message aback to the controller. Once that command is executed, the action will follow suit and the message will be complete. Each VISCA command controls its own setting, so there are no overlaps in existing commands.

VISCA Protocol:

For our VISCA protocol, please head to our download page at aidaimaging.com/download to find the full command packet.

NDI[®] HX2 Protocol:

What is NDI[®]?

NDI[®] is NewTek's innovative Network Device Interface technology, is a royalty free standard enabling IP video workflows across Ethernet networks. NDI[®] HX2 is a bi-directional standard that allows video systems to identify and communicate with one another over IP, and to encode, transmit, and receive multiple streams of broadcast-quality, low latency, frame-accurate video and audio in real time. The NDI[®] HX2 encoding algorithm is resolution and frame rate independent, supporting up to 4K and beyond, as well as multi-channel, floating-point audio up to 16 channels and beyond. NDI[®] HX2 also includes tools to implement video access and grouping, bi-directional metadata, tally, and more

What about NDI® HX2?

NDI[®] HX2 is the next generation for efficient NDI protocol. It uses H.264, but is also capable of using H.265 (HEVC) for even more efficient compression. There are a couple of differences between NDI[®] HX2 and its predecessor, NDI[®] |HX.

Some differences is that NDI[®] HX2 is a true native NDI[®] stream from the camera source. It is considered a better implementation than the previous generation, allowing for a more reliable, lower latency video. It shares very similar features to true NDI[®], such as discovery options, ability to carry metadata, and control of low level network transmission. (TCP)

You will also not need any drivers for NDI[®] HX2, as NDI 4 will be used to decode it. This makes it a lot easier on previous versions of equipment. For more info on the differences between the three different types of NDI[®], please view the next page.

NDI[®] HX2 Protocol: (CONTD.)

Parameter	NDI®	NDI® HX	NDI® HX2
Transport	TCP/UDP/Multi-TCP	UDP (TCP)	TCP/UDP/Multi-TCP
Image Format	Size / Aspect Independent	Size / Aspect Independent	Size / Aspect Independent
Tally Feedback	Yes	Yes	Yes
Bidirectional Device Control	Yes	Yes	Yes
Integrated Alpha Channel	Yes	No	No
Compression	NDI® Codec	HX (H.264)	H.264/H.265
Connection	Socket, Unicast / Multicast and FEC	Unicast/MultiCast	Socket, Unicast / Multicast and FEC
HD (1080i) Data Rate	~ 100 Mbit/s	8-20 Mbit/s	1-50 Mbit/s
Essence Packing	Discrete Audio, Metadata and Video Frame packets, single connection	Delivered as Discrete Audio, Metadata and Video Frame packets, single connection	Discrete Audio, Metadata and Video Frame packets, single connection
Infrastructure	Gigabit / Load Balanced Multi NIC / 10GBit	Gigabit / Wireless	Gigabit / Wireless
Service Discovery	Bonjour (mDNS), NDI® Access (manual), Server (NDI®4)	automatic via HX Driver	Bonjour (mDNS), NDI® Access (manual), Server (NDI®4)
API	free license, SDK Libraries for Win(x86), Mac, Linux(x86 & ARM), iOS, FPGA reference	hardware encode, Decode with NDI® Libraries	Send with NDI® Embedded SDK, Receive with Free NDI® Libraries

Where do these cameras sit in the market now?

The HD-NDI-200 and HD3G-NDI-200 propel the NDI[®] HX2 protocol to great heights with our world renowned form factor, quality, and cost effectiveness. The HD-NDI-200 was made 4 years ago and easily became one of the GO-TO models when it came to POV NDI[®] cameras. With the HD3G-NDI-200 following its fame – it's a good sign that the POV NDI[®] market will continue to grow, and AIDA will be at the front supplying that same perfect formula our customers and fans love!

Warranty and Support:

Warranty:

AIDA Imaging warrants its cameras and items to be free from defects under normal use. With that in mind, we fulfill 2 years of warranty from the date of purchase unless otherwise noted. Please refer to our website for more information at: aidaimaging.com/support

Support:

If you would like additional support or explanation on anything on this manual, please feel free to go to our FAQ page on our website at aidaimaging.com/support. If you are in need of additional help, or have any general questions, please feel free to contact us in these various ways:

Telephone: 909.333.7421

Email: <u>Support@aidaimaging.com</u>

Website: aidaimaging.com/support

We are open yearly, Mon-Fri 8A.M. to 5P.M. PST, excluding major holidays and events.

Also, keep up to date with firmwares and new releases from AIDA Imaging by signing up for our newsletter, found on our website.



기자재 명칭(모델명) : NDI POV Camera 인증번호 : R-R-alD_HD-NDF-CUBE 인증 받은 자의 상호 : (주)에이치플러스텍 제조년월 : 제조자/제조국가 :(주)에이치플러스텍 / 한국

