zeevee™

Intelligent AV Distribution

ZyPer4K Decoder with integrated Dante Transmitter

HDMI 2.0
IP A/V DISTRIBUTION SYSTEM

User Manual

Updated January 2022

About ZeeVee:

ZeeVee is the leading manufacturer of high-quality encoder/modulator/decoder products for video distribution over any type of transmission media; be it RF coax, fiber, or copper ethernet.

Established in 2007, ZeeVee has been manufacturing industry-leading products while operating the company responsibly in compliance with the strictest levels of regulatory and environmental requirements. The standards by which we govern our corporate conduct are far higher than that required by law.

Our mission is to completely fulfill the toughest customer application requirements with the highest quality products we can produce. After the sale, we strive to support the customer with award-winning support and service. Our goal is that no customer shall be ever be dissatisfied. It is both our mission and our passion.

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Decoder Function

The function of the ZyPer4K Decoder device (Decoder) is to accept 10G Ethernet traffic that represents the information to be decoded and displayed. When the appropriate IP stream is received the Decoder unit will first strip off the encryption that protects the payload on its transit across the network. It then reformats the video and audio information for display and plays it out its HDMI video output. Audio is also played out the appropriate port as included.

Other ports on the Decoder devices are for the carriage of USB, IR, RS232 and audio data as well as a 1Gbit/second utility port for general purpose connectivity of devices to the 10Gb bulk data infrastructure.

Common Interfaces on all Decoders:

- Power Input (12VDC)
- RS232 Input/Output
- 1Gbit/sec Utility Ethernet Port
- Analog Audio Output
- Infrared Input and Output
- HDMI 2.0 Output
- Equipotential Grounding Lug

Ethernet Bulk Media Interface:

10Gb Fiber *or* 10Gb Copper

Optional Interfaces on Decoder Units:

DisplayPort:

(none) or present

USB:

(none) *or*
2x USB Type-A Interface

Dante Transmitter:

(none) or present

In total there are 12 different, unique Decoder types that can be ordered.

HDMI Fiber	HDMI Fiber with USB	HDMI Copper	HDMI Copper with USB
DisplayPort Fiber	DisplayPort Fiber with USB	DisplayPort Copper	DisplayPort Copper with USB
HDMI Fiber (Quiet/ Fanless)	HDMI Copper (Quiet/ Fanless)	**HDMI Copper with USB and Dante Transmitter**	**HDMI Fiber with USB and Dante Transmitter**

Decoder

The function of the ZyPer4K Decoder is to accept a 10Gb IP feed containing the video information to be displayed. It decrypts, decodes and formats the video and audio information for display on the attached viewing device. The decoder is capable of outputting any HDMI 2.0 resolution supplied by the encoder including full 4K, 4:4:4 at 60Hz. There are several different variations based on the user's desired media type and USB options.

Enclosure variants

There are three sizes of the ZyPer4K Decoder unit enclosure.

Output Function	Box Size
HDMI Output	Base unit: 175mm Wide x 43mm High x 144mm Deep
HDMI Output (Quiet/Fanless)	Base unit: 164mm Wide x 44mm High x 145mm Deep
HDMI and DisplayPort Output	Base unit: 175mm Wide x 43mm High x 144mm Deep
HDMI + Dante Transmitter	**Extended unit: 227mm Wide x 43mm High x 144mm Deep**

Common Ports

The following ports are common to all decoders, regardless of the interface options.

Port Name	Index	Definition
Power	A	12VDC from supply at 1.2A (center +, ring-)

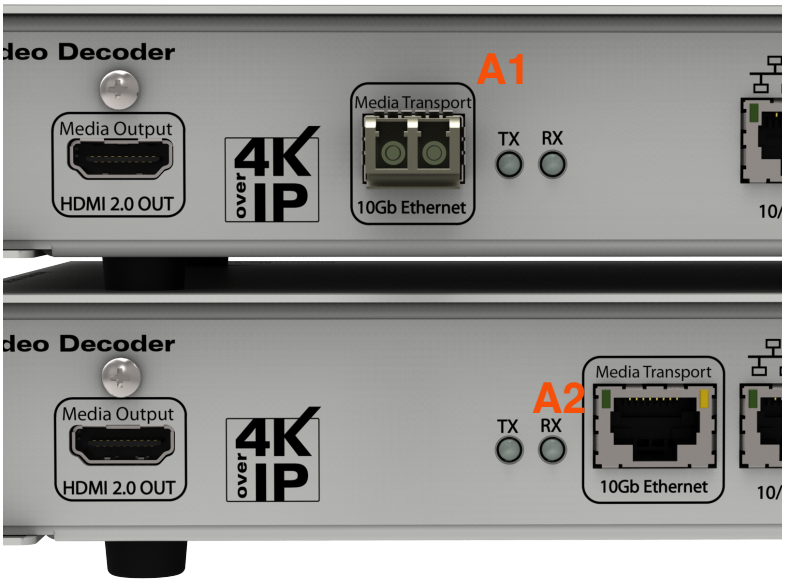
Port Name	Index	Definition
Utility Network	B	10/100/1000Base-T Ethernet port. Used for general purpose device attachment to network. Traffic will be switched on to media network. (Not available on models with Dante transmitter. See special notes on Utility Port later in this document)
Ground Lug	C	For equipotential referencing of the box, this lug may be connected the environmental ground using a customer-supplied ground lead.

Port Name	Index	Definition
HDMI Output	A	HDMI 2.0 Output port. Capable of up to 4K60 4:4:4 with embedded audio and HDCP2.2 encryption.

Port Name	Index	Definition
RS 232 Port	A	RS232 Control Port for sending and receiving side-band serial traffic to/from encoders as directed by ZyPer Management Platform. (ZMP)
LED PWR	B	LED illuminated when unit is powered
LED VID	C	LED Illuminated when active video is being processed

Port Name	Index	Definition
Audio	D	Audio Output Jack. Drives line-level stereo audio on 3.5mm jack. (Not available on models with Dante Transmitter)
IR-OUT	E	Infrared Commands information passed FROM Encoders to Decoders as configured by ZMP.
IR-IN	F	Infrared Commands to be passed TO Encoders as configured by ZMP.
RESET	G	Reset to factory defaults. Using a wire or paper clip, lightly press into this hole while unit is being powered on. Hold for 10 seconds to reset the unit to factory defaults. Note: Only factory resets the ZyPer4K unit. Does not factory reset the Dante transmitter module.

Optional Ports: 10Gb Ethernet



Port Name	Index	Definition
10G Fiber	A1	10 Gigabit Ethernet Connection. Uses standard 10Gb SFP devices.
10G Copper	A2	10Gb Ethernet over Cat6a or better cabling. RJ45

Optional Ports: USB

The ZyPer4K Decoder device can be ordered with optional USB connectivity.

Shown to the left is a unit with the USB option (top) and without the USB option (bottom) installed. This is a build-time option and is not retrofittable to the product.

Port Name	Index	Definition
USB	A	2 ports of USB 2.0 Type-A connectivity. Either port may be used and both operate simultaneously.

Important Note

The USB system requires its own IP Address that is different and independent from the IP Address of the ZyPer4K itself. Therefore a ZyPer4K unit with integrated USB needs two IP addresses. Customers that are using a DHCP server to generate IP Addresses must ensure the pool of available IP Addresses accounts these extra devices needing IP Addresses in the system.

If no DHCP server is available, the USB controller will assign itself a Link-Local address. However, if there is a DCHP server, but there are not enough addresses available in the pool, USB connections may fail.

There is no means of setting the USB controller with a Static IP address.

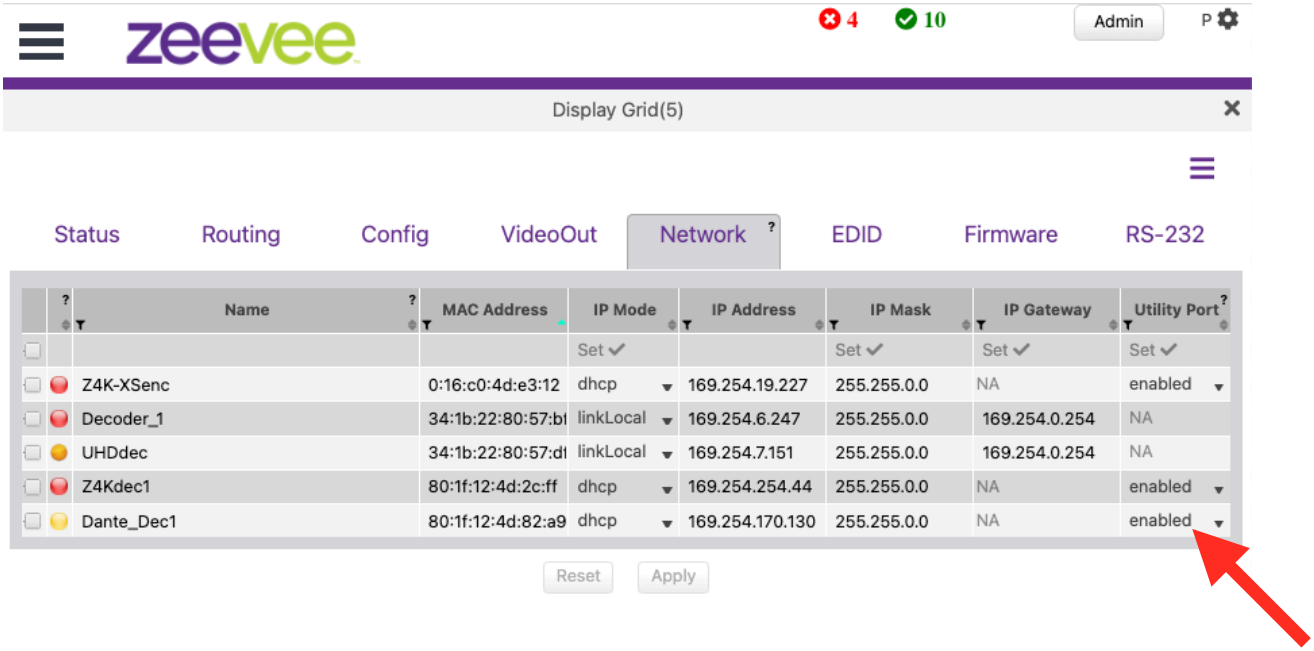
Utility Port

The Dante transmitter inside the ZyPer4K decoder gains access to the 10G network via an internal 1G network. On non-Dante ZyPer4K units this 1G port is exposed externally and is known as the Utility Port.

It is possible in both the API and the ZyPer Management Platform to disable the Utility port for security reasons.

Critical Note: You must not ever disable the Utility Port on ZyPer4K decoders that contain a Dante transmitter. This action will block access of the Dante transmitter to the network and Dante Controller will no longer be able to access the transmitter.

Image below shows enable/disable option for Utility Port in ZyPer Management Platform GUI.



Below is command syntax to enable/disable Utility Port from API Command Line Interface:

```
set device <deviceMac|deviceName> utilityPort enabled|disabled
```

Dante Transmitter

The ZyPer4K Decoder device can be ordered with an optional internal Dante Transmitter. Note this is an extended box to accommodate the Dante Transmitter hardware.

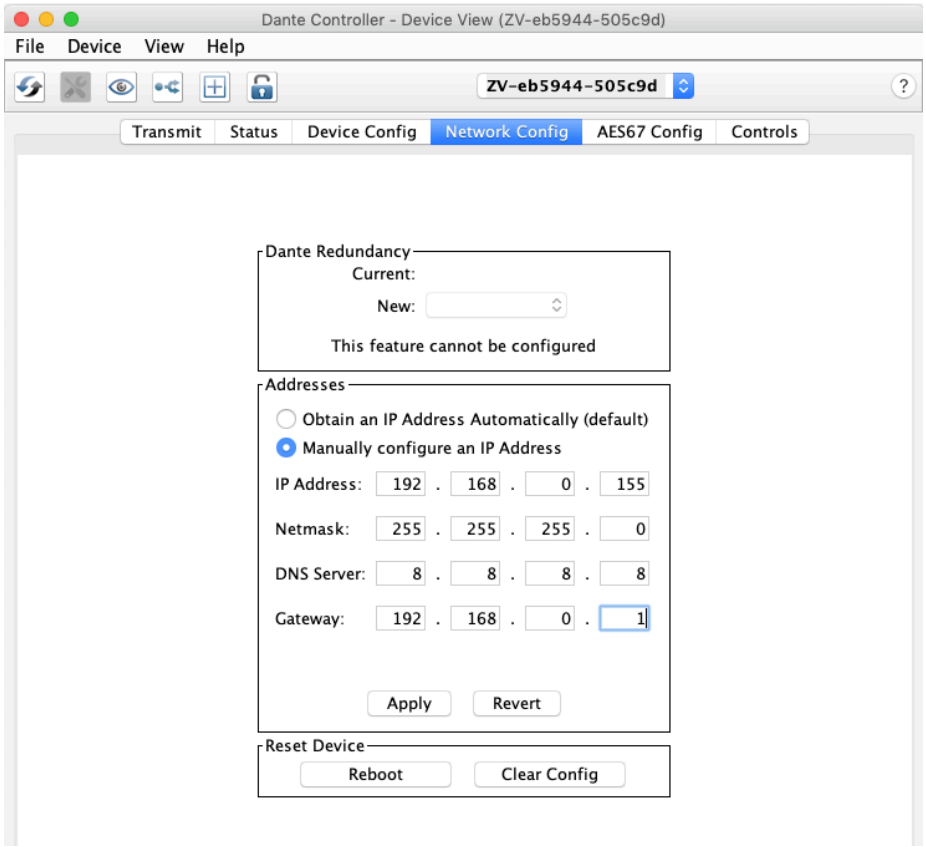
Important Note

The Dante Transmitter requires its own IP Address that is different and independent from the IP Address of the ZyPer4K itself. This includes the Dante Transmitter IP address being on a different subnet. Customers that are using a DHCP server to generate IP Addresses must ensure the pool of available IP Addresses accounts for any ZyPer4K decoders with Dante Transmitters in the system.

If no DHCP server is available, the Dante Transmitter will assign itself a Link-Local address. However, if there is a DCHP server, but there are not enough addresses available in the pool, Dante connections may fail.

The Dante Transmitter can be assigned a Static IP address via the Dante Controller software.

Important Note: The Dante Transmitter cannot be reset to defaults anywhere except Dante Controller. Forgetting the Static IP address will make the transmitter unreachable.



Dante Operation

It is expected that the user is familiar with Dante and the use of Dante networks. It is beyond the scope of this document to provide Dante training.

The Dante Transmitter found in the ZyPer4K decoder will insert the *analog audio* or *HDMI audio* stream that it is receiving onto the Dante Network. It is possible the AV video network and the Dante audio network are in fact the same network. It is not possible to route Dante audio traffic from one VLAN onto another VLAN.

Below are example API commands for sending either HDMI or Analog audio to the Dante Transmitter: (Dante Transmitter is considered the Analog-Audio-Out of the decoder)

Commands with API version 2.1 or older

Analog audio source to Dante

```
join <encoder> <decoder> analog-audio
set decoder <decoder> analog-audio-out source analog-audio
```

HDMI audio source to Dante

```
join <encoder> <decoder> hdmi-audio
set decoder <decoder> analog-audio-out source hdmi-audio-downmix
```

Commands with API version 2.11 or newer

Analog audio source to Dante

```
join <encoder> <decoder> analogAudio
set decoder <decoder> analogAudioOut source analogAudio
```

HDMI audio source to Dante

```
join <encoder> <decoder> hdmiAudio
set decoder <decoder> analogAudioOut source hdmiAudioDownmix
```

For additional information refer to the ZyPer Management Platform User Guide for details on streaming audio/video from an encoder to a decoder.

https://www.zeevee.com/zyper_management_platform_user_manual/

Network settings are the same as standard ZyPer4K encoders/decoders.
Some switches may require additional settings to work with a Dante network. For example the Netgear M4300 series requires settings detailed at the following location:

https://kb.netgear.com/000060205/M4300-Configuration-Guide-for-Dante-Audio-Devices

The user should consult the documentation for the switch provider being used.

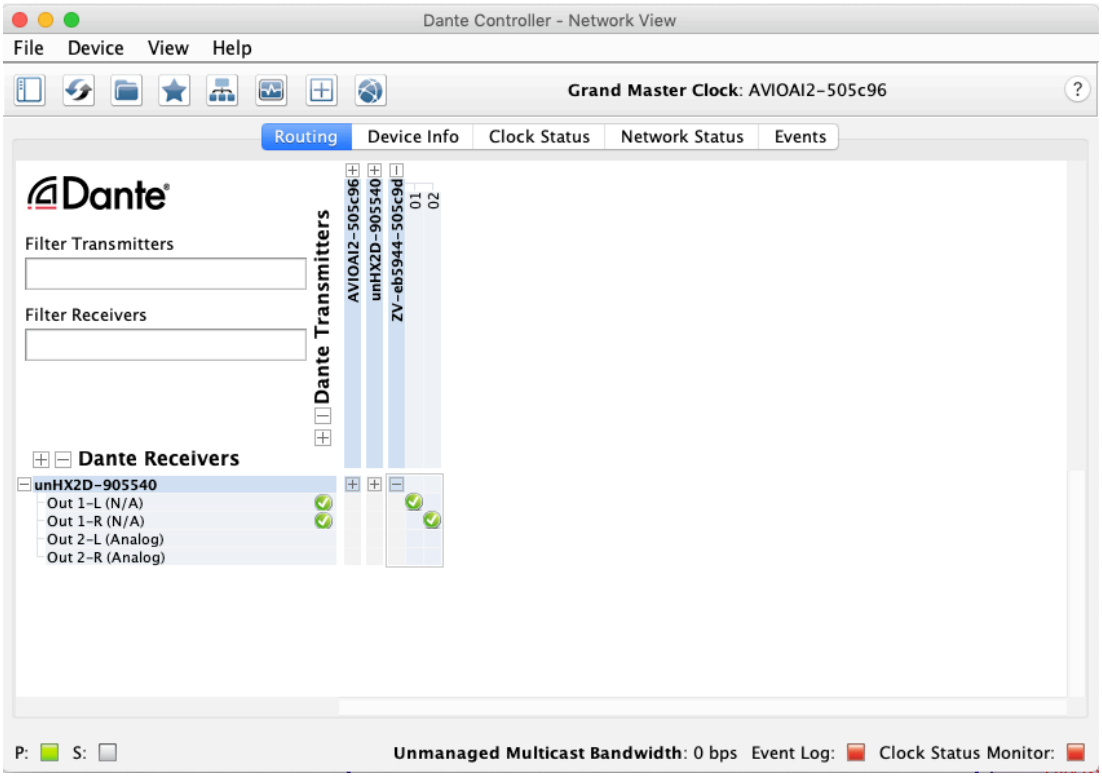
In Dante Controller the device will appear as a Transmitter with the name ZV-XXXXXX-YYYYYY

XXXXXX - Represents the final bytes of the ZyPer4K MAC Address
YYYYYY - Represents the final bytes of the Dante AVIOAI2 Transmitter MAC Address

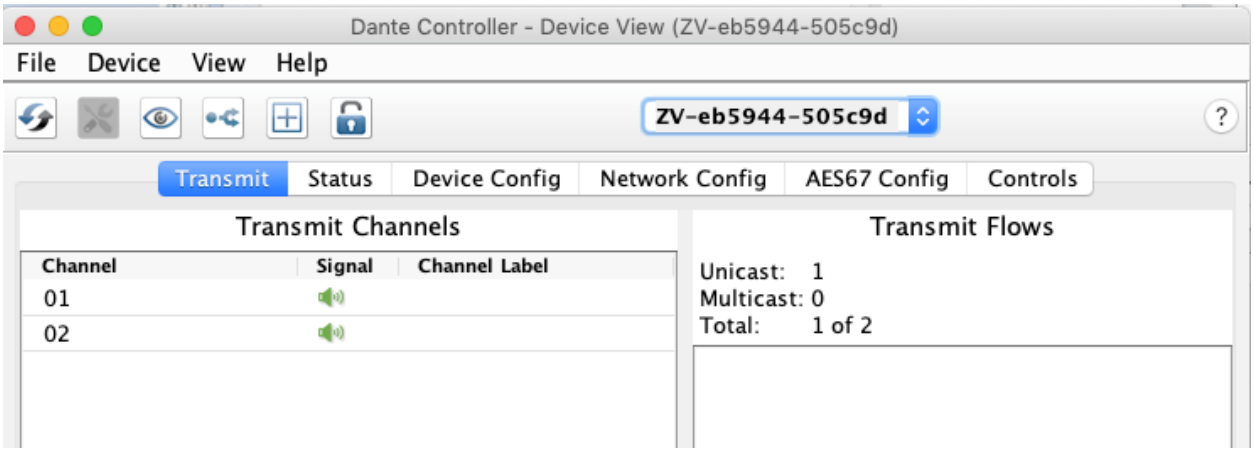
Note that the device can be renamed in Dante Controller software.

Below are screen shots from *Dante Controller*.

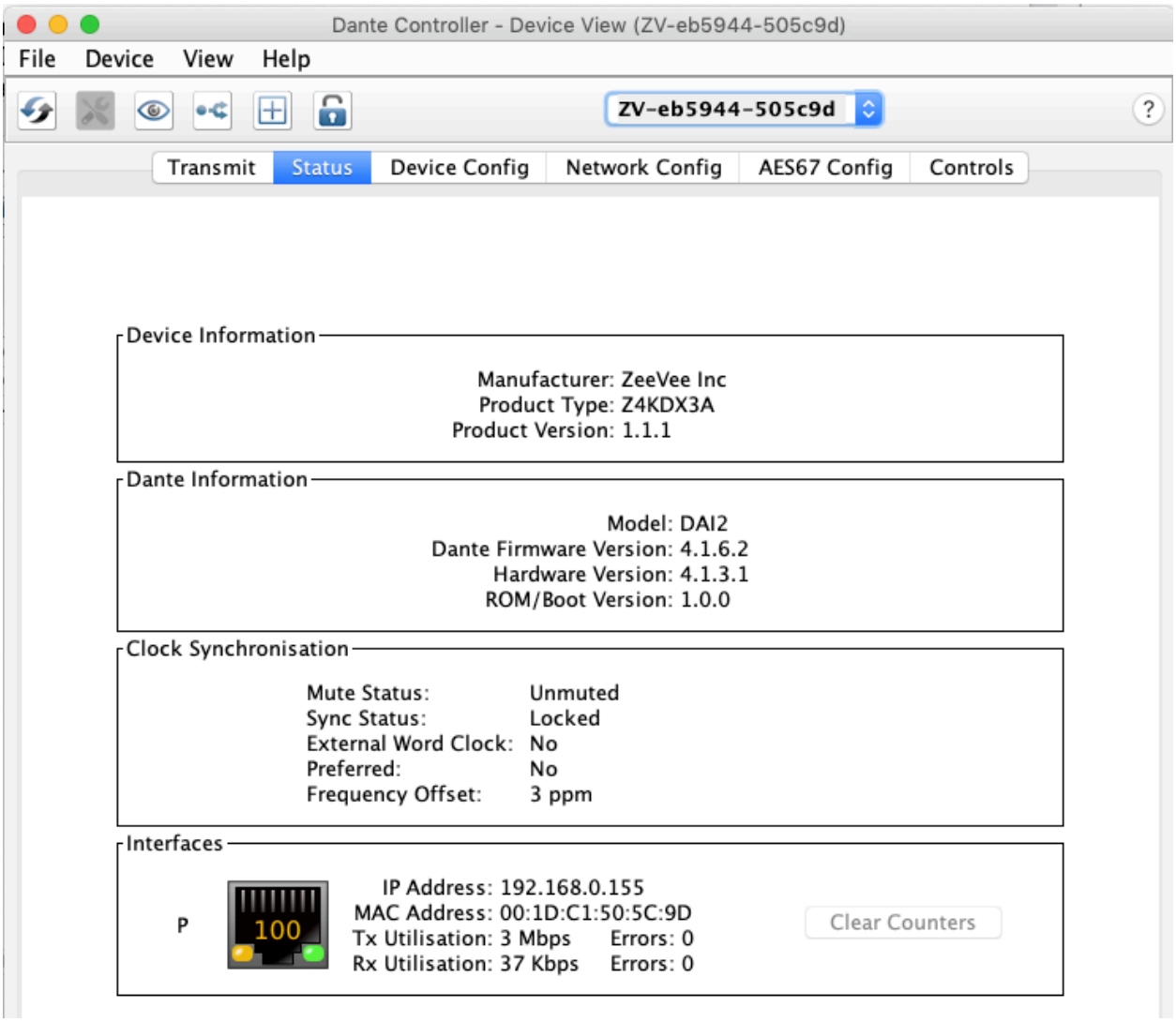
Dante Controller main screen Routing tab:



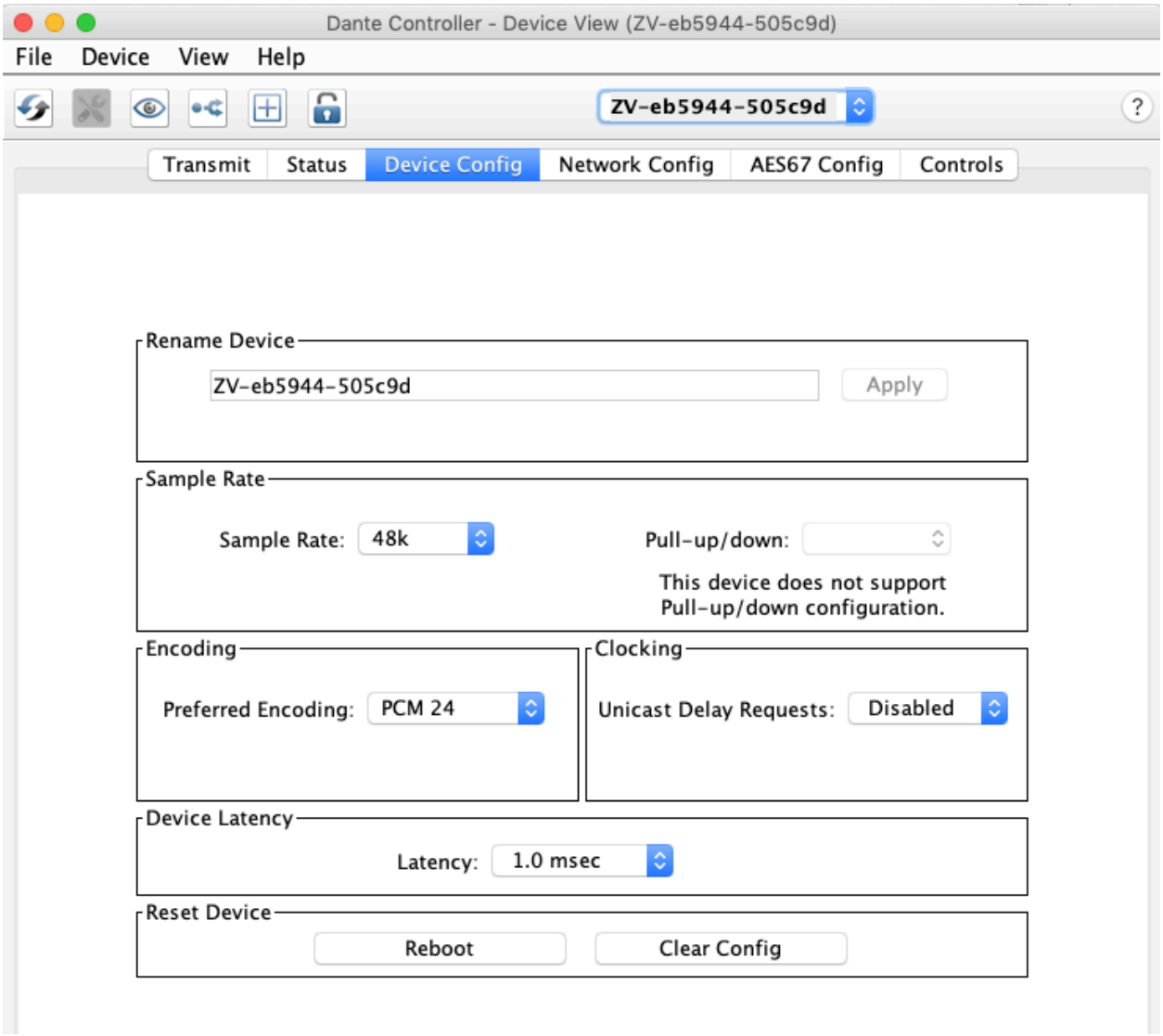
Transmit tab with details on Dante Transmitter



Status tab with details on Dante Transmitter

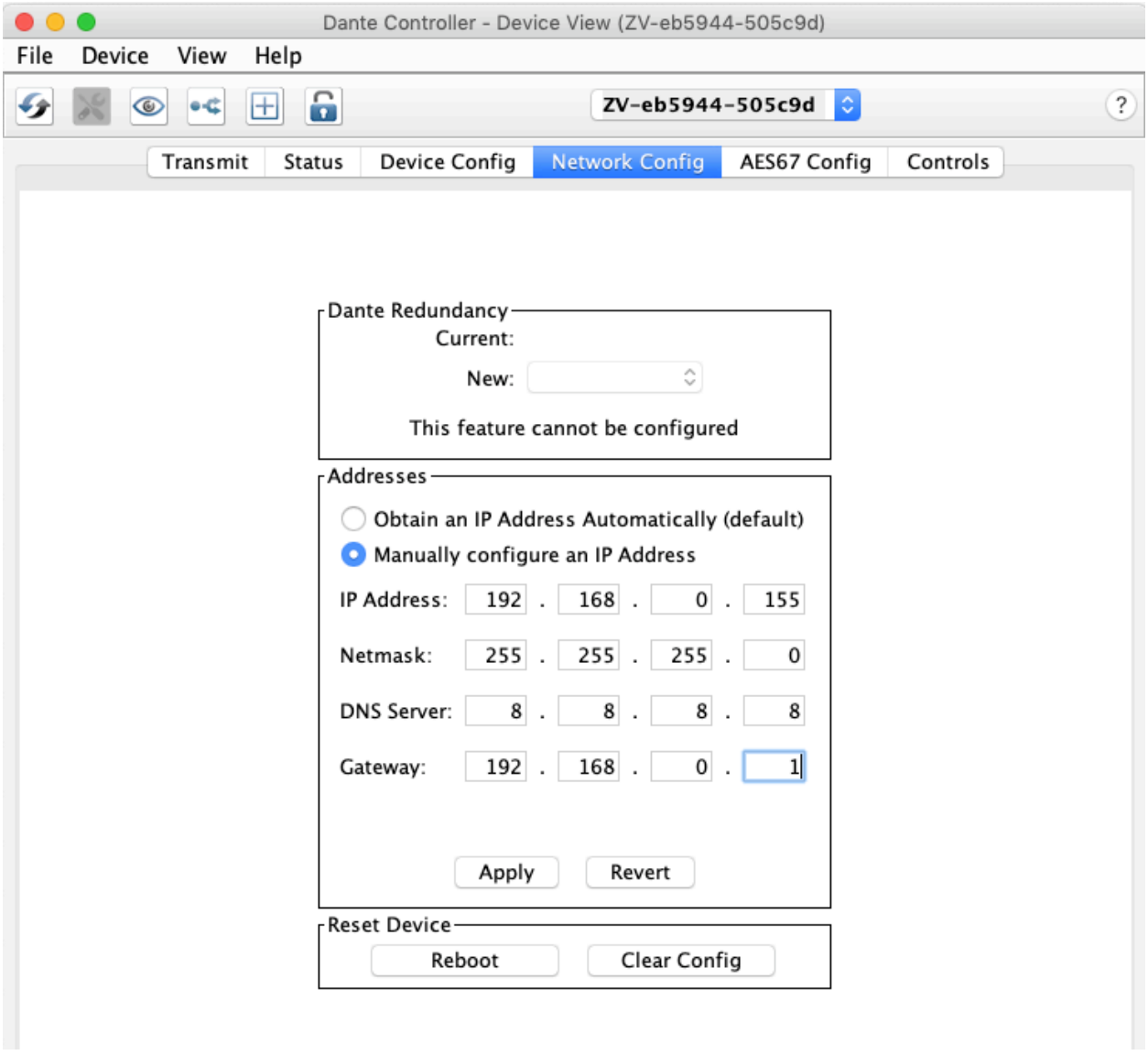


Device Config tab with details on Dante Transmitter

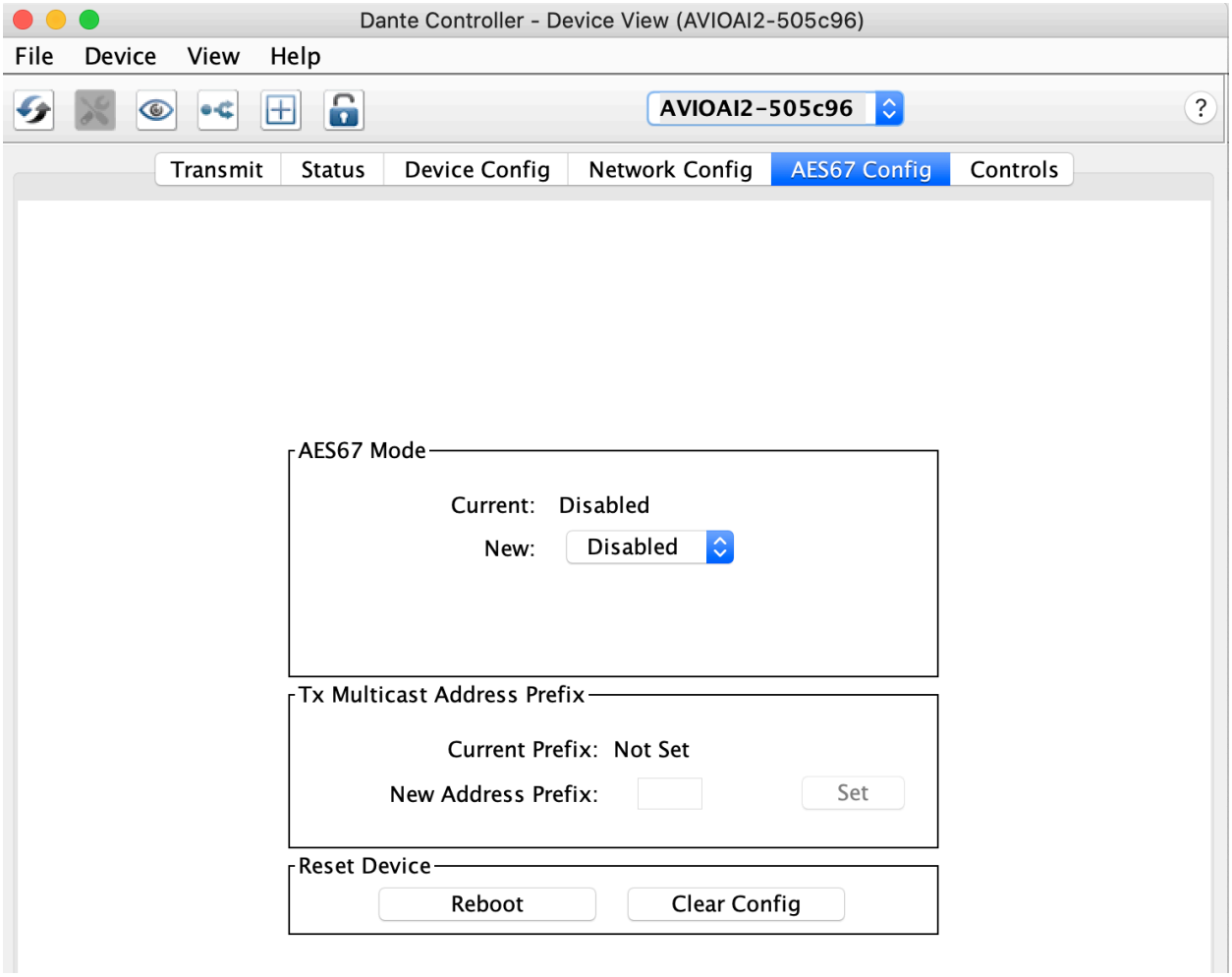


Network Config tab with details on Dante Transmitter

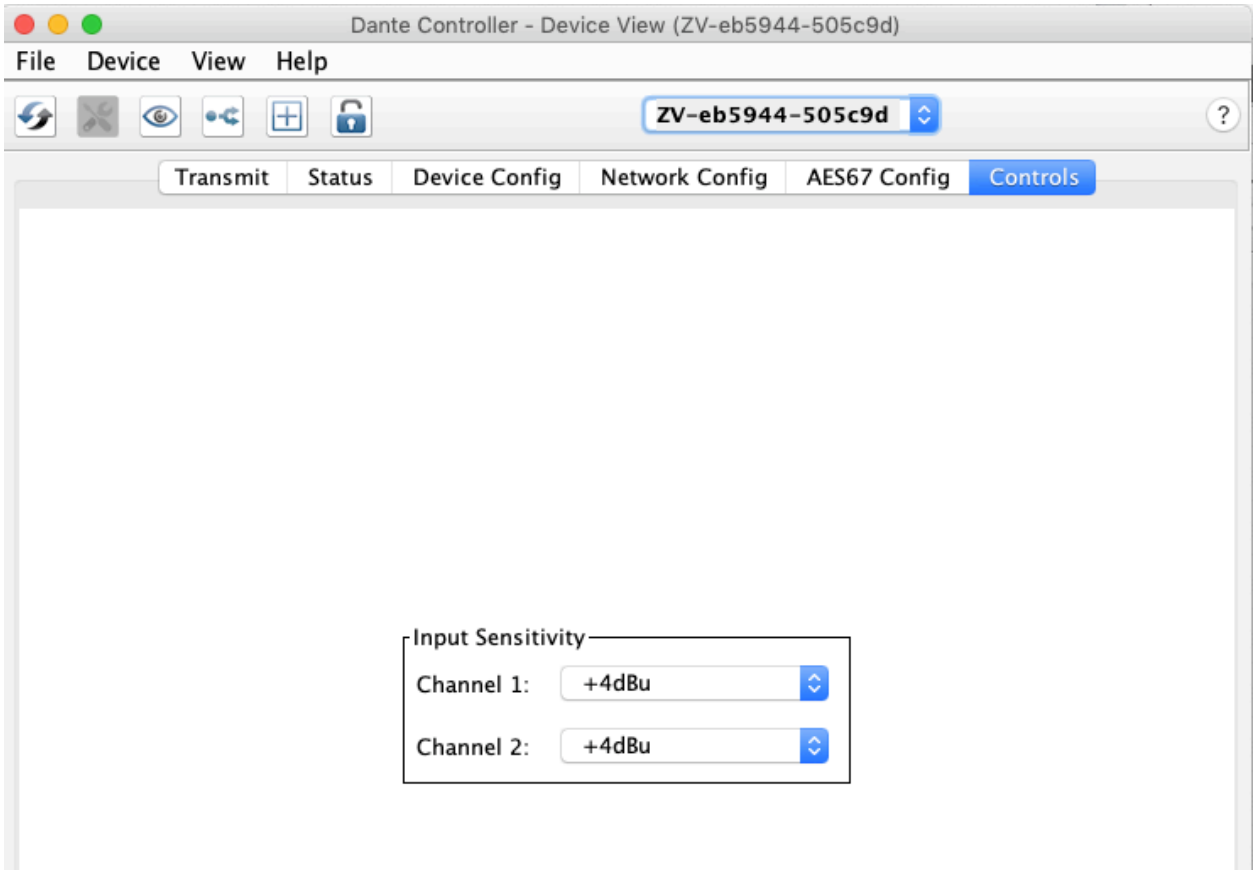
Note: You must Reboot the Dante Transmitter for new IP Address configuration to take effect. Rebooting the Dante Transmitter will not cause the ZyPer4K unit itself to reboot.



AES67 Config Tab
(Used to Enable or Disable AES67 mode. Requires reboot of Dante Transmitter)



Controls tab with details on Dante Transmitter.
(Used to adjust input lever of audio to the Transmitter)



Device Technical Specifications

Encoder and Decoder HDMI Video Specifications

All encoders and decoders have one exposed HDMI port. It is an input on the encoder and an output on the decoder. All the parameters in terms of the formats of video and audio carried are the same for either.

HDMI	ZyPer4K Enc	ZyPer4K Dec	
HDMI Standard Port	✓	✓	HDMI 2.0 with HDR* and HDCP 2.2 Support
Direction	✓		Input
		✓	Output
Connector	✓	✓	Type-A receptacle (female)
HDMI Resolutions	✓	✓	Supports all major VESA resolutions and variations including full **HDMI 2.0 and HDR* support**: 640x480 (p/i) 720x576 (25Hz/50Hz)(p/i) 800x600 (p) 1024x768 (p) 1280x720 (p/i) 1280x1024 (p) 1366x768 (p) 1440x1080 (p) 1600x1200 (p) 1920x1080 (p/i) 2048x1536 (p) 3840x2160 (p) **Including 4:4:4, 60 Hz support** 4096x2160 (p) **Including 4:4:4, 60 Hz support** all at 24/25/29.97/30/50/59.94/60Hz refresh rates except where noted HDR fully supported in “Genlocked” mode HDR inputs reduced to 8-bits on output in “Fast-Switch mode”
HDMI Audio	✓	✓	Encoded audio formats and LPCM (HDMI to HDMI audio is “passed-through” from encoder to decoder) *Additional restrictions may result from the audio supported at encoder’s input.*

Dante Transmitter Specifications

Dante Transmitter	ZyPer4K	Information
	Dec	
Dante Transmitter	✓	Audinate AVIO-DAI2 (See detailed specifications below)
Direction	✓	Output
Channels	✓	2
Connector	✓	No connector. Uses shared 10Gb Ethernet port

Dante Transmitter Feature	Specification
Max signal level (Balanced)*	**+24dBu** / +4dBu / 0dBu / 0dBV / -10dBV
Frequency Response	20Hz to 20kHz (±0.5dB)
Impedance	10k Ohm
Dynamic Range	> 100dB
Signal to Noise Ratio	> 100 dB
Total Harmonic Distortion	< 0.01% at +4dBu
Sample Rates	44.1, 48, 88.2, 96 kHz
Bit Depth	24
Dante Device Latency	1, 2, or 5ms (configurable via Dante Controller)
Network Transport	Dante Audio over IP AES67 RTP

* Values in bold are default settings, which can be changed in Dante Controller

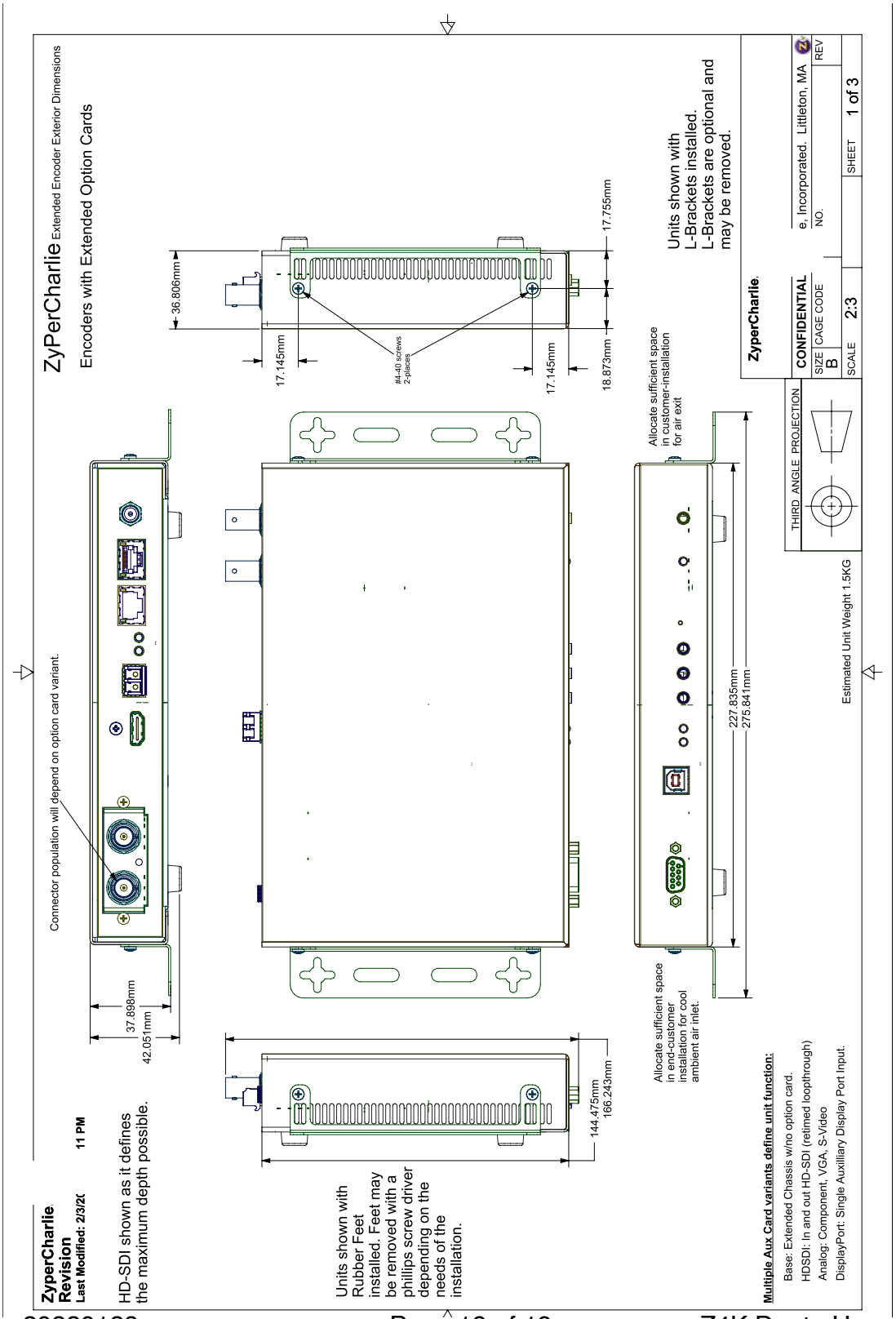
Physical and Environmental

The following parameters apply to all encoders and decoders unless specifically stated otherwise.

Type	Parameter
A/C Adapter	100-1240VAC 50-60Hz 0.7-0.45A draw on AC Mains Output Max: 12VDC 2.5A
ZyPer4K unit power consumption	12VDC at 1.2A max 12W nominal (Standard Fiber Encoder/Decoder) 12VDC at 1.6A max 15W nominal (Standard Copper Encoder/Decoder) 12VDC at 1.2A max 12.5W nominal (Extended input Fiber Encoder) 12VDC at 1.6A max 15.5W nominal (Extended input Copper Encoder) **12VDC at 1.2A max 12.5W nominal (Decoder with Dante Transmitter, Fiber)** **12VDC at 1.6A max 15.5W nominal (Decoder with Dante Transmitter, Copper)** USB Option (Adds 660mW power to above versions)
Dimensions (LxWxH) maximum envelope	144mm x 175mm** x 43mm* (Decoder or Encoder with no extended option) **144mm x 228mm** x 43mm* (Encoder or Decoder with extended option)** 145mm x 164mm x 44mm* (Quiet/Fanless Decoder) *subtract 6mm from height if rubber feet are removed ** add 48mm to overall width if both mounting ears are installed
Weight	880g (Decoder, Encoder with no extended input option) 850g (Quiet/Fanless Decoder) 1070g (Encoder with extended input option) **1070g (Decoder with Dante Transmitter)**
Operating Temperature	0° C to +40° C (32° F to 104° F)
Non-Operating Temp	-20° C to +80° C (-4° F to +176° F)
Humidity (op/ storage)	20% to 90% (Non-Condensing)
Coating	**White, satin anti-microbial powder coat** Black, anti-microbial powder coat (Quiet/Fanless Decoder)

Physical Dimension Diagrams

Extended encoders and decoder with Dante Transmitter



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