

# DATA SHEET

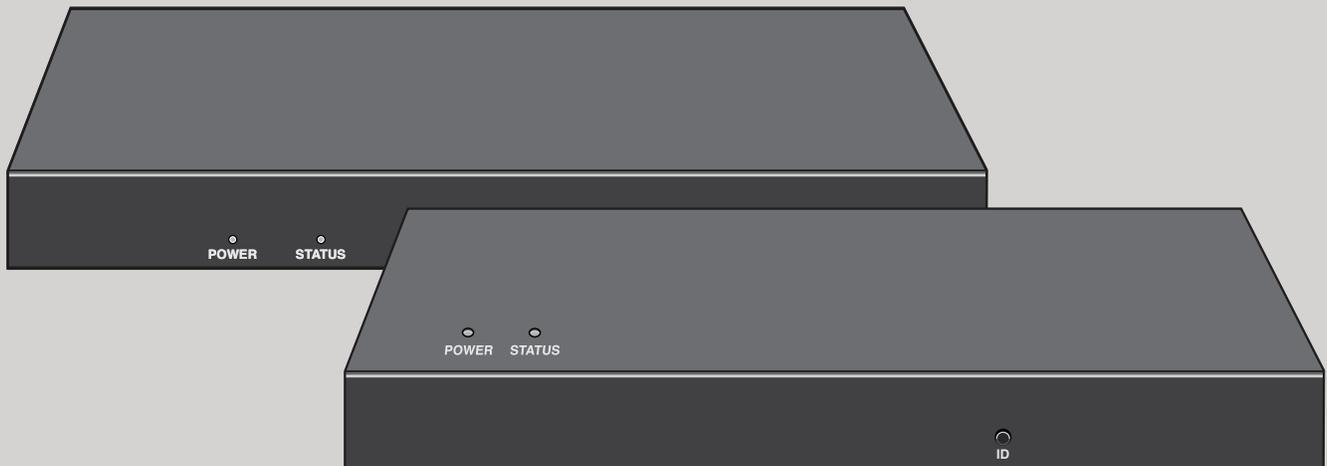
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VS-2001-ENC, VS-2001-DEC

# HDMI OVER IP H.264 ENCODER AND DECODER

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24/7 TECHNICAL SUPPORT AT 877.877.2269 OR VISIT [BLACKBOX.COM](http://BLACKBOX.COM)



**BLACK BOX**

# OVERVIEW

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## HDMI OVER IP H.264 ENCODER AND DECODER DATA SHEET

### INTRODUCTION

VS-2001-ENC is a live streaming media encoder that interfaces with HDMI signals for delivering media over IP networks. VS-2001-ENC can be used with a VS-2001-DEC decoder or third-party decoder such as a set-top box, a VLC and Kodi media player on PCs to provide complete end-to-end streaming systems. It features one HDMI input and one Ethernet output for simplified integration into AV systems.

VS-2001-ENC uses standards-based H.264/MPEG-4 AVC encoding and MPEG-2 transport streams, and outputs multicast IP streams that can easily be decoded and viewed on the VS-2001-DEC or third-party decoders. Up to ten RTSP sessions can work simultaneously. Encoding controls provide adjustments for bit rate and quality. VS-2001-ENC offers integration-friendly control features: LAN (Web GUI and Telnet), providing simple, flexible control and management options.

The decoder uses H.264 video compressing technology to decode video content with visual lossless quality at the link that provides limited bandwidth. The decoder also supports AAC audio encoding technology so the audio signal can be delivered with low bandwidth but high quality.

### FEATURES: ENCODER

- SUPPORTS STANDARDS-BASED H.264/MPEG-4 AVC VIDEO COMPRESSION
- SELECTABLE AUDIO ENCODING CONTROL FROM LPCM AND AAC – LPCM OFFERS A FIXED AUDIO ENCODING BIT RATE WHILE AAC FEATURES VARIABLE AUDIO COMPRESSION, AVAILABLE TO SUPPORT DIFFERENT STREAMING BIT RATE REQUIREMENTS
- ENCAPSULATES A/V OUTPUT DATA INTO MPEG-2 TRANSPORT STREAM. THE PROGRAM NUMBER CAN BE ALTERED
- DELIVERS TS DATA THROUGH UDP OR RTP. BOTH UNICAST AND MULTICAST ARE SUPPORTED
- SUPPORTS RTSP BY WHICH A CLIENT ENTITY CAN BUILD A SESSION AND PLAY THE MEDIA CONTENT. UP TO TEN RTSP SESSIONS CAN WORK SIMULTANEOUSLY

### FEATURES: ENCODER (CONTINUED)

- SUPPORTS OUTPUT RATE LIMIT. WITH THE UNIQUE DESIGN OF THE ENCODER'S RATE LIMIT CONTROL MECHANISM, THE DEVICE CAN SMOOTH THE OUTPUT RATE AND MAKE OUTPUT DATA SUCCESSFULLY PASS THROUGH NETWORKS WITH STRICT BANDWIDTH LIMITS
- LAN (WEB GUI & TELNET) CONTROL -- VS-2001-ENC IS CONTROLLABLE OVER ETHERNET, AVAILABLE FOR AN INTUITIVE WEB PAGE CONTROL AS WELL AS TELNET CLI CONTROL USING API COMMANDS
- SUPPORTS POE TO BE REMOTELY POWERED BY A PIECE OF COMPATIBLE POWER SOURCE EQUIPMENT SUCH AS A POE SWITCH, ELIMINATING THE NEED FOR A NEARBY POWER OUTLET

### FEATURES: DECODER

- EQUIPPED WITH H.264 AND AAC CODEC TECHNOLOGY, TO SUPPORT HIGH VIDEO/AUDIO QUALITY WITH LOW BANDWIDTH
- RECEIVES TS DATA VIA UNICAST OR MULTICAST METHOD, UDP AND RTP PAYLOAD ARE BOTH SUPPORTED
- SUPPORTS RTSP PROTOCOL TO NEGOTIATE WITH THE ENCODER TO GET THE ADDRESS OF THE MEDIA DATA
- HANDLES RESOLUTIONS UP TO 1920 X 1200 @ 60 HZ AND 3840 X 2160 @ 30 HZ
- SUPPORTS STATIC IP, DHCP AND AUTO IP
- BONJOUR PROTOCOL SUPPORTED, CAN BE DISCOVERED BY BONJOUR BROWSER
- CONTROLS THE DISPLAY THROUGH RS-232 OR CEC
- "WHERE AM I" FEATURE SUPPORTED, ONCE IT RECEIVES A "LOCATE DEVICE" COMMAND, THE DEVICE CAN TWINKLE THE STATUS INDICATOR WITH A SPECIAL MODE TO INDICATE ITS PHYSICAL POSITION
- FEATURES ONE ETHERNET INPUT, ONE HDMI OUTPUT, ONE ANALOG AUDIO OUTPUT, ONE RS-232 OUTPUT AND 12-VDC POWER
- TWO CONTROLLING APPROACHES: TELNET API AND WEB UI
- TWO POWER MODES: 12 VDC AND POE



# SPECIFICATIONS

## HDMI OVER IP H.264 ENCODER (VS-2001-ENC)

FRONT VIEW



VS-2001-ENC

BACK VIEW



VS-2001-ENC

### WHAT'S INCLUDED WITH THE VS-2001-ENC

- (1) HDMI OVER IP H.264 ENCODER (VS-2001-ENC)
- (1) POWER ADAPTER (12 VDC, 1 A)
- (2) PHOENIX CONNECTORS (MALE, 3.5-MM, 3-PIN)
- (2) RACKMOUNTING EARS

### HDMI OVER IP H.264 ENCODER (VS-2001-ENC) SPECIFICATIONS

VIDEO	
INPUT VIDEO PORT	(1) HDMI in
INPUT VIDEO TYPE	HDMI 1.4 with HDCP 2.2
SUPPORTED INPUT VIDEO RESOLUTIONS	HDMI: Video: 640 x 480 <sup>8</sup> , 800 x 600 <sup>8</sup> , 1024 x 768 <sup>8</sup> , 1280 x 768 <sup>8</sup> , 1280 x 800 <sup>8</sup> , 1280 x 1024 <sup>8</sup> , 1360 x 768 <sup>8</sup> , 1366 x 768 <sup>8</sup> , 1440 x 900 <sup>8</sup> , 1400 x 1050 <sup>8</sup> , 1600 x 1200 <sup>8</sup> , 1680 x 1050 <sup>8</sup> , 1920 x 1200 <sup>8</sup> , 720 x 480 <sup>8</sup> (480 p), 720 x 576 <sup>8</sup> (576p), 1280 x 720 <sup>5</sup> (720p30), 1280 x 720 <sup>6</sup> (720p50), 1280 x 720 <sup>6</sup> (720p60), 1920 x 1080 <sup>2</sup> (1080p24), 1920 x 1080 <sup>3</sup> (1080p25), 1920 x 1080 <sup>5</sup> (1080p30), 1920 x 1080 <sup>6</sup> (1080p50), 1920 x 1080 <sup>6</sup> (1080p60), 1920 x 1200 <sup>8</sup> , 3840 x 2160 <sup>5</sup> 1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = at 60 Hz, 9 = at 75 Hz Audio: RAW PCM data, 48 kHz sps
INPUT VIDEO SIGNAL	0.5 –1.2 V p-p
INPUT DDC SIGNAL	5 V p-p (TTL)
VIDEO IMPEDANCE	100 ohms
VIDEO ENCODING BIT RATE	2 Mbps to 30 Mbps (configurable)
OUTPUT VIDEO PORT	(1) LAN (PoE), 10/100/1000BASE-T
OUTPUT VIDEO TYPE	H.264/MPEG-4 AVC
OUTPUT VIDEO RESOLUTIONS	Video: 640 x 480 <sup>8</sup> , 800 x 600 <sup>8</sup> , 1024 x 768 <sup>8</sup> , 1280 x 768 <sup>8</sup> , 1280 x 800 <sup>8</sup> , 1280 x 1024 <sup>8</sup> , 1360 x 768 <sup>8</sup> , 1366 x 768 <sup>8</sup> , 1440 x 900 <sup>8</sup> , 1400 x 1050 <sup>8</sup> , 1600 x 1200 <sup>8</sup> , 1680 x 1050 <sup>8</sup> , 1920 x 1200 <sup>8</sup> , 720 x 480 <sup>8</sup> (480 p), 720 x 576 <sup>8</sup> (576p), 1280 x 720 <sup>5</sup> (720p30), 1280 x 720 <sup>6</sup> (720p50), 1280 x 720 <sup>6</sup> (720p60), 1920 x 1080 <sup>2</sup> (1080p24), 1920 x 1080 <sup>3</sup> (1080p25), 1920 x 1080 <sup>5</sup> (1080p30), 1920 x 1080 <sup>6</sup> (1080p50), 1920 x 1080 <sup>6</sup> (1080p60), 1920 x 1200 <sup>8</sup> , 3840 x 2160 <sup>5</sup> 1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = at 60 Hz, 9 = at 75 Hz Audio: Encoding: LPCM, AAC; Sampling Rate: 48 kHz; Bitrate: 1.6 Mbps (LPCM), < or = 240 kbps (AAC) Delivery: Encapsulation Format: MPEG-2 transport stream Transmission Format: TS over UDP, TS over RTP Transmission Method: unicast, multicast, RTP over RTSP Session Control: RTSP (SETUP, TEARDOWN, OPTIONS, PLAY, DESCRIBE)

# SPECIFICATIONS

## HDMI OVER IP H.264 ENCODER (VS-2001-ENC)

HDMI OVER IP H.264 ENCODER (VS-2001-ENC) SPECIFICATIONS (CONTINUED)	
<b>AUDIO</b>	
INPUT AUDIO PORT	(1) HDMI in
SAMPLING RATE	48 kHz
OUTPUT CONNECTORS	(1) 3.5-mm 3-pin Phoenix connector, (1) RJ-45
SUPPORTED OUTPUT	Unbalanced stereo audio; Encoding: stereo LPCM/AAC; Sampling Rate: 48 kHz; Bit rate: 1.6 Mbps (LPCM), ≤ 240 kbps (AAC)
OUTPUT AUDIO PORT	(1) LAN (PoE), 10/100/1000BASE-T
<b>CONTROL</b>	
CONTROL CONNECTORS	(1) RJ-45, 10/100/1000BASE-T Ethernet port; (1) RS-232, to control peripheral equipment
CONTROL METHOD	Web UI; Telnet CLI
<b>GENERAL</b>	
OPERATING TEMPERATURE	32 to 113° F (0 to 45° C)
STORAGE TEMPERATURE	-4 to +140° F (-20 to +70° C)
OPERATING HUMIDITY	10 to 90%, noncondensing
STORAGE HUMIDITY	10 to 90%, noncondensing
POWER	12 VDC, 1 A or PoE
POWER CONSUMPTION	7.6 W (DC adapter) NOTE: Powered by PoE: 10 W (min.) for safe operation
ESD PROTECTION	Human body model: ±8 kV (air-gap discharge) ±4 kV (contact discharge)
SURGE PROTECTION	Voltage: ±1 KV
CASE DIMENSIONS	10.2" H x 14.2" W x 3.3" D (26 x 36 x 8.5 cm)
PRODUCT DIMENSIONS	1.7" H x 8.7" W x 7.0" D (4.4 x 22 x 17.8 cm)
WEIGHT	1.8 lb. (0.8 kg)
CERTIFICATION	CE, FCC
<b>NETWORKING</b>	
IP ADDRESS	DHCP/Static/Auto IP
NETWORK SWITCH	Multicast, IGMP V2
LATENCY	About 90 ms in low delay mode or 35 0ms in high quality mode, in average, end to end from Encoder to Decoder



# SPECIFICATIONS

## HDMI OVER IP H.264 DECODER (VS-2001-DEC)

FRONT VIEW



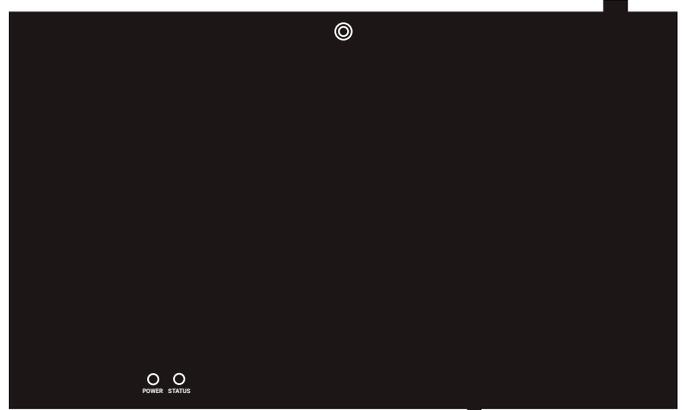
VS-2001-DEC

BACK VIEW



VS-2001-DEC

TOP VIEW



VS-2001-DEC

### WHAT'S INCLUDED WITH THE VS-2001-DEC

- (1) HDMI OVER IP H.264 DECODER (VS-2001-DEC)
- (1) POWER ADAPTER (12 VDC, 1 A)
- (2) PHOENIX CONNECTORS (MALE, 3.5-MM, 3-PIN)
- (2) RACKMOUNTING EARS

### HDMI OVER IP H.264 DECODER (VS-2001-DEC) SPECIFICATIONS

VIDEO	
INPUT VIDEO PORT	(1) LAN (PoE), 10/100/1000BASE-T
INPUT VIDEO TYPE	H.264/MPEG-4 AVC
SUPPORTED INPUT VIDEO RESOLUTIONS	<p>Video:</p> <p>Encoding: H.264/MPEG-4 AVC;</p> <p>Bitrate: &lt; or = 30 Mbps</p> <p>Resolution:</p> <p>640 x 480<sup>s</sup>, 800 x 600<sup>s</sup>, 1024 x 768<sup>s</sup>, 1280 x 768<sup>s</sup>, 1280 x 800<sup>s</sup>, 1280 x 1024<sup>s</sup>, 1360 x 768<sup>s</sup>, 1366 x 768<sup>s</sup>, 1440 x 900<sup>s</sup>, 1400 x 1050<sup>s</sup>, 1600 x 1200<sup>s</sup>, 1680 x 1050<sup>s</sup>, 1920 x 1200<sup>s</sup>, 720 x 480<sup>s</sup> (480 p), 720 x 576<sup>s</sup> (576p), 1280 x 720<sup>s</sup> (720p30), 1280 x 720<sup>s</sup> (720p50), 1280 x 720<sup>s</sup> (720p60), 1920 x 1080<sup>s</sup> (1080p24), 1920 x 1080<sup>s</sup> (1080p25), 1920 x 1080<sup>s</sup> (1080p30), 1920 x 1080<sup>s</sup> (1080p50), 1920 x 1080<sup>s</sup> (1080p60), 1920 x 1200<sup>s</sup>, 3840 x 2160<sup>s</sup></p> <p>1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = at 60 Hz, 9 = at 75 Hz</p> <p>Audio:</p> <p>Encoding: LPCM, AAC;</p> <p>Sampling Rate: 48 kHz;</p> <p>Bitrate: 1.6 Mbps (LPCM), &lt; or = 240 kbps (AAC)</p> <p>Delivery:</p> <p>Encapsulation Format: MPEG-2 transport stream</p> <p>Transmission Format: TS over UDP, TS over RTP</p> <p>Transmission Method: unicast, multicast, RTP over RTSP</p> <p>Session Control: RTSP (SETUP, TEARDOWN, OPTIONS, PLAY, DESCRIBE)</p>
OUTPUT VIDEO PORT	(1) HDMI
OUTPUT VIDEO TYPE	HDMI 1.4 with HDCP 2.2
OUTPUT VIDEO RESOLUTIONS	<p>HDMI: 640 x 480<sup>s</sup>, 800 x 600<sup>s</sup>, 1024 x 768<sup>s</sup>, 1280 x 768<sup>s</sup>, 1280 x 800<sup>s</sup>, 1280 x 1024<sup>s</sup>, 1360 x 768<sup>s</sup>, 1366 x 768<sup>s</sup>, 1440 x 900<sup>s</sup>, 1400 x 1050<sup>s</sup>, 1600 x 1200<sup>s</sup>, 1680 x 1050<sup>s</sup>, 1920 x 1200<sup>s</sup>, 720 x 480<sup>s</sup> (480 p), 720 x 576<sup>s</sup> (576p), 1280 x 720<sup>s</sup> (720p30), 1280 x 720<sup>s</sup> (720p50), 1280 x 720<sup>s</sup> (720p60), 1920 x 1080<sup>s</sup> (1080p24), 1920 x 1080<sup>s</sup> (1080p25), 1920 x 1080<sup>s</sup> (1080p30), 1920 x 1080<sup>s</sup> (1080p50), 1920 x 1080<sup>s</sup> (1080p60), 1920 x 1200<sup>s</sup>, 3840 x 2160<sup>s</sup></p> <p>1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = at 60 Hz, 9 = at 75 Hz</p> <p>Audio output: Unbalanced stereo</p>
VIDEO IMPEDANCE	100 ohms



# SPECIFICATIONS

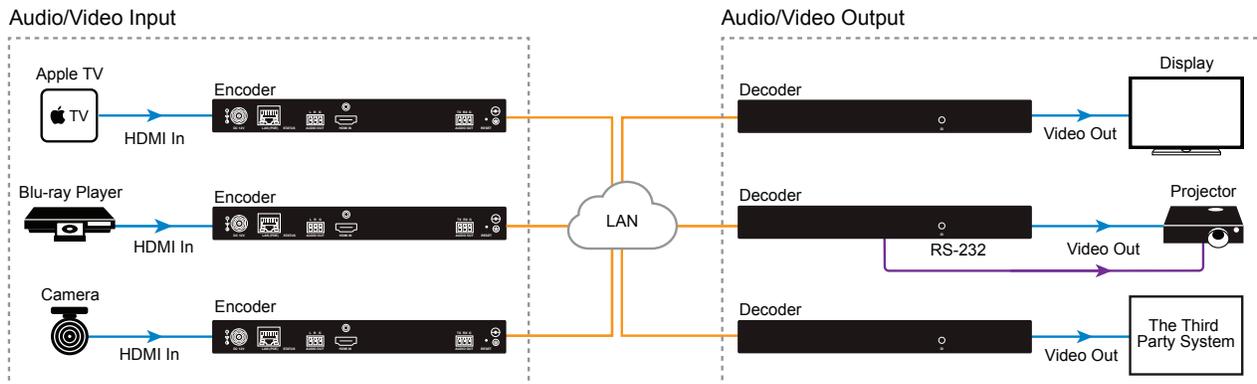
## HDMI OVER IP H.264 DECODER (VS-2001-DEC)

HDMI OVER IP H.264 DECODER (VS-2001-DEC) SPECIFICATIONS (CONTINUED)	
<b>AUDIO</b>	
INPUT AUDIO PORT	(1) LAN
INPUT AUDIO FORMAT	Encoding: LPCM, AAC; Sampling Rate: 48 kHz; Bitrate: 1.6 Mbps (LPCM), < or = 240 kbps (AAC)
OUTPUT AUDIO	(1) HDMI Out, stereo, (1) 3.5-mm 3-pin Phoenix connector
<b>CONTROL</b>	
CONTROL CONNECTORS	(1) RJ-45, 10/100/1000BASE-T Ethernet port; (1) 3.5-mm, 3-pin Phoenix connector for RS-232 communication
CONTROL METHOD	RS-232: The third system: CLI for controlling the device itself; CEC: Display: Power ON/OFF; Ethernet: Web UI, Telnet CLI
<b>GENERAL</b>	
OPERATING TEMPERATURE	32 to 113° F (0 to 45° C)
STORAGE TEMPERATURE	-4 to +140° F (-20 to +70° C)
OPERATING HUMIDITY	10 to 90%, noncondensing
STORAGE HUMIDITY	10 to 90%, noncondensing
POWER	12 VDC, 1 A or PoE
POWER CONSUMPTION	5.6 W (DC adapter) NOTE: Powered by PoE: 10 W (min.) for safe operation
ESD PROTECTION	Human body model: ±8 kV (air-gap discharge) ±4 kV (contact discharge)
CASE DIMENSIONS	3" H x 12.2" W x 7.1" D (7.6 x 31 x 18 cm)
PRODUCT DIMENSIONS	1" H x 9" W x 4.4" D (2.5 x 22.8 x 11.1 cm)
WEIGHT	1.8 lb. (0.8 kg)
CERTIFICATION	CE, FCC
<b>NETWORKING</b>	
IP ADDRESS	DHCP/Static/Auto IP
NETWORK SWITCH	Multicast, IGMP V2
LATENCY	About 90 ms in low delay mode or 35 0ms in high quality mode, in average, end to end from Encoder to Decoder
<b>OTHER</b>	
VIDEO WALL	Up to 16 x 16



# APPLICATION DIAGRAMS

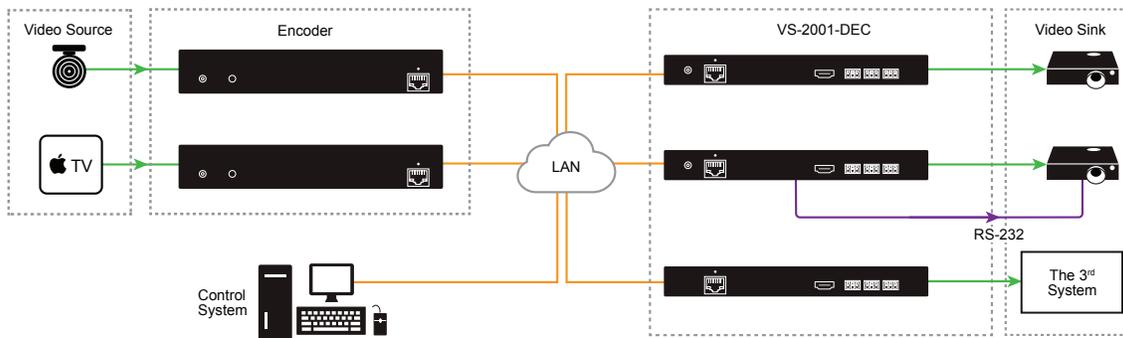
## HDMI OVER IP H.264 ENCODER AND DECODER (VS-2001-ENC AND VS-2001-DEC)



TYPICAL INSTALLATION



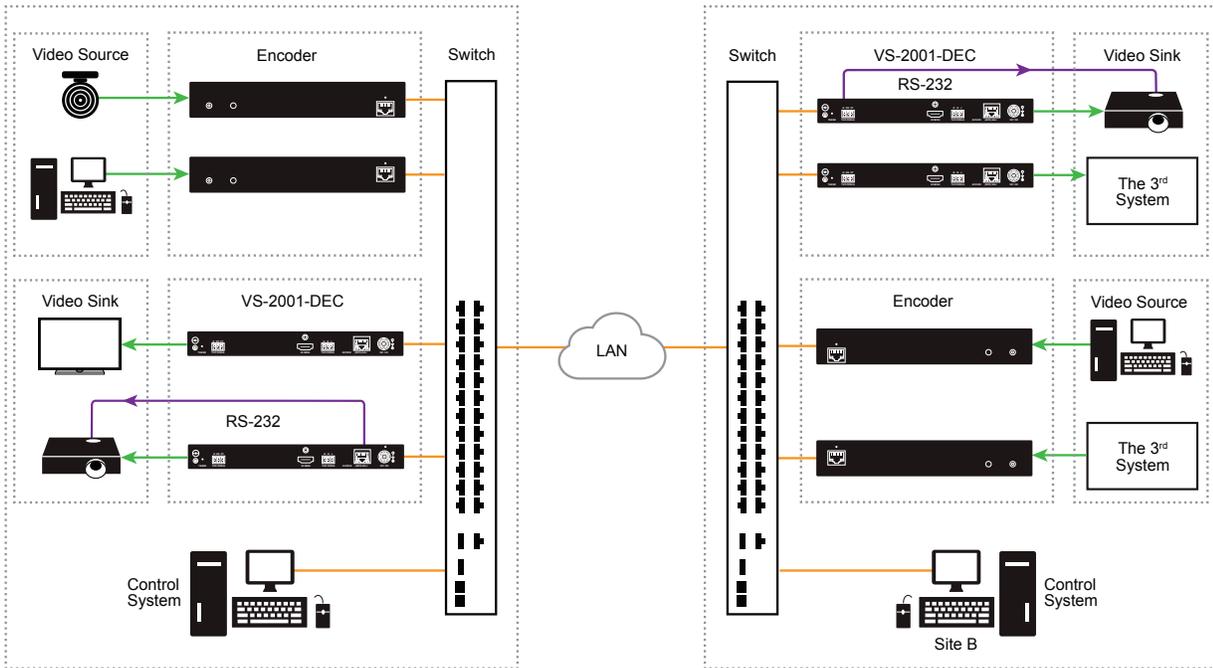
POINT-TO-POINT EXTENSION



POINT-TO-MULTIPOINT EXTENSION

# APPLICATION DIAGRAMS

## HDMI OVER IP H.264 ENCODER AND DECODER (VS-2001-ENC AND VS-2001-DEC)



A/V DELIVERY OVER WAN

