

USER MANUAL

VS-2001-ENC

HDMI OVER IP H.264 ENCODER

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM

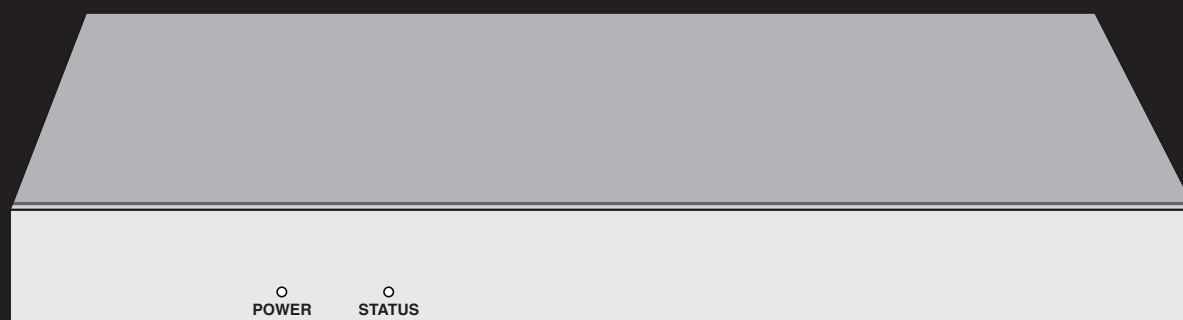


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SAFETY PRECAUTIONS

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- ♦ Do not expose this unit to rain, moisture, dripping or splashing liquids. Do not place objects filled with liquids, such as vases, on the unit.
- ♦ Do not install or place this unit in a bookcase, built-in cabinet, or in another confined space. Make sure the unit is well ventilated.
- ♦ To prevent the risk of electric shock or fire hazard caused by overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
- ♦ Do not install near any heat sources, such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that may produce heat.
- ♦ Do not place sources of naked flames, such as candles, on the unit.
- ♦ Clean this unit only with a dry cloth.
- ♦ Unplug the unit during lightning storms, or when unused for long periods of time.
- ♦ Protect the power cord from being walked on or pinched, particularly at plugs.
- ♦ Only use attachments/accessories specified by the manufacturer.
- ♦ Refer all servicing to qualified personnel.

CHAPTER 1: SPECIFICATIONS

TABLE 1-1. SPECIFICATIONS

SPECIFICATION	DESCRIPTION
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 480⁸, 800 x 600⁸, 1024 x 768⁸, 1280 x 768⁸, 1280 x 800⁸, 1280 x 1024⁸, 1360 x 768⁸, 1366 x 768⁸, 1440 x 900⁸, 1400 x 1050⁸, 1600 x 1200⁸, 1680 x 1050⁸, 1920 x 1200⁸, 720 x 480⁸ (480 p), 720 x 576⁸ (576p), 1280 x 720⁵ (720p30), 1280 x 720⁶ (720p50), 1280 x 720⁸ (720p60), 1920 x 1080² (1080p24), 1920 x 1080³ (1080p25), 1920 x 1080⁵ (1080p30), 1920 x 1080⁶ (1080p50), 1920 x 1080⁸ (1080p60), 1920 x 1200⁸, 3840 x 2160⁵ 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 480⁸, 800 x 600⁸, 1024 x 768⁸, 1280 x 768⁸, 1280 x 800⁸, 1280 x 1024⁸, 1360 x 768⁸, 1366 x 768⁸, 1440 x 900⁸, 1400 x 1050⁸, 1600 x 1200⁸, 1680 x 1050⁸, 1920 x 1200⁸, 720 x 480⁸ (480 p), 720 x 576⁸ (576p), 1280 x 720⁵ (720p30), 1280 x 720⁶ (720p50), 1280 x 720⁸ (720p60), 1920 x 1080² (1080p24), 1920 x 1080³ (1080p25), 1920 x 1080⁵ (1080p30), 1920 x 1080⁶ (1080p50), 1920 x 1080⁸ (1080p60), 1920 x 1200⁸, 3840 x 2160⁵ 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)
Audio	
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



CHAPTER 1: SPECIFICATIONS

TABLE 1-1 (CONTINUED). SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Control	
Control Connectors	(1) RJ-45, 10/100/1000BASE-T Ethernet port; (1) RS-232, to control peripheral equipment
Control Method	Web UI; Telnet CLI
General	
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	7.6W (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
Networking	
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

CHAPTER 2: OVERVIEW

2.1 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 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 IP streams that can easily be decoded and viewed on the third party decoders. The multicast streams are output and can be received and decoded by multiple 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.

By extending AV signals over networks, VS-2001-ENC significantly expands AV system capability.

2.2 FEATURES/BENEFITS

2.2.1 FEATURES

- ♦ Standards-based H.264/MPEG-4 AVC video compression —VS-2001-ENC employs the High Profile of the H.264/MPEG-4 AVC compression standard.
- ♦ 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.
- ♦ 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.

2.2.2 BENEFITS

- ♦ Input: one HDMI input
- ♦ Supports a wide range of resolutions for input signals from standard definition to 3840 x 2160 @ 30 Hz, including 1920 x 1080 @ 60 Hz and 1920 x 1200 @ 60 Hz
- ♦ Output: one 10/100/1000BASE-T Ethernet output
- ♦ Output resolutions follow input
- ♦ Streams HDMI signals over IP networks
- ♦ Capable of outputting IP streams that can easily be decoded and viewed on the VS-2001-DEC or third-party decoders. The multicast streams are output and can be received and decoded by multiple decoders.



CHAPTER 2: OVERVIEW

- Use with a third-party decoder such as a set-top box and a VLC media player on PCs to provide complete end-to-end streaming systems.
- Supports HDCP as well as its configuration of different applications.
- Supports the following streaming transport protocols.
 - RTP/RTSP streaming transport protocols may be applied, based on various network conditions
 - Native RTP and MPEG-2 Transport Streams - TS may be applied in unicast or multicast streaming applications. TS may be transported over UDP or RTP based on network conditions.
- Bonjour automatic discovery of VS-2001-ENC
- "Where am I" feature supported, once the encoder receives a "locate device" command, the device can twinkle the status indicator with a special mode to indicate its physical position.
- Software upgrade through an embedded web page.
- Supports communications protocols used on the Internet such as TCP/IP, ARP, DHCP, ICMP (ping), IGMP, Telnet, HTTP, RTP, RTSP, UDP
- Rackmountable 1U, half-rack width metal enclosure
- 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.
- Encoding quality controls including video bit rate and audio bit rate— two user controls are available to adjust encoding quality.

2.3 WHAT'S INCLUDED

Your package should contain the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com

- (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

CHAPTER 2: OVERVIEW

2.4 HARDWARE DESCRIPTION

2.4.1 FRONT PANEL

Figure 2-1 shows the front panel of the encoder. Table 2-1 describes its components.



FIGURE 2-1. FRONT PANEL

TABLE 2-1. FRONT-PANEL COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	STATUS	DESCRIPTION
1	Power Indicator	ON	Encoder is powered ON.
		OFF	Encoder is powered OFF.
2	Status Indicator	ON	Encoder works properly.
		OFF	Encoder is not in the normal working state.



CHAPTER 2: OVERVIEW

2.4.2 BACK PANEL

Figure 2-2 shows the back panel of the encoder. Table 2-2 describes its components.

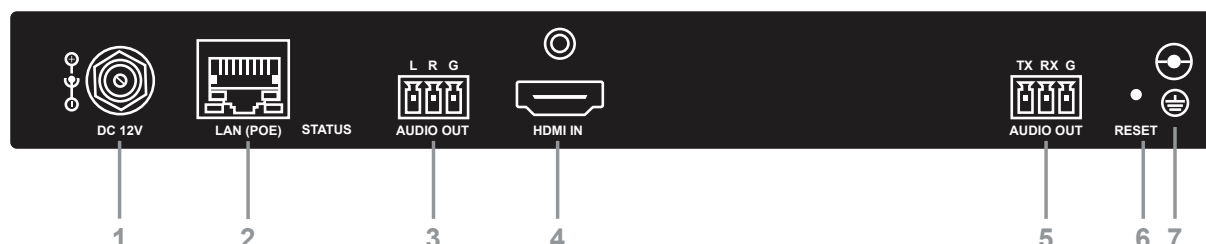


FIGURE 2-2. BACK PANEL

TABLE 2-2. BACK-PANEL COMPONENTS

NUMBER IN FIGURE 2-2	COMPONENT	DESCRIPTION
1	Barrel connector	Connects to a 12-V, 1-A power supply. NOTE: We recommend that you power encoders/decoders using either power adapters or a PoE switch instead of using power supplies and PoE at the same time. For example, if you want to use power adapters, ensure that the PoE function of the connected LAN ports in the switch is disabled or a non-PoE switch is used.
2	RJ-45 connector	Video Output: (1) LAN (PoE): Connects to an Ethernet switch for streaming media output NOTE: If you use a PoE Ethernet switch, the encoder can be powered by this switch, eliminating the need for a nearby power outlet.
3	(1) 3.5-mm Phoenix connector, 3-pin, female	Audio Output: (1) AUDIO OUT: Connects to an audio output device such as an amplifier or a speaker.
4	HDMI connector	Video Input: (1) HDMI IN: connects to an HDMI video source such as a DVD player and a computer.
5	(1) 3.5-mm Phoenix connector, 3-pin, female	RS-232 passthrough control: (1) RS-232: connects to a third party device such as a camera, which can be controlled by IP configurator and IP controller on your computer.
6	Reset button	RESET: Reset the device to its factory defaults. When the device is powered on, use a pointed stylus to hold down the RESET button for five or more seconds, and then release it, it will reboot and restore to its factory defaults. NOTE: When the settings are restored, your custom data is lost. Therefore, exercise caution when using the RESET button.
7	Grounding screw	Connects to the ground for preventing electric shock and device damage.

CHAPTER 3: HARDWARE INSTALLATION

WARNINGS:

Before the installation, disconnect the power supplies from all the devices.

During the installation, do not connect VS-2001-ENC to a PoE power source equipment and its power adapter at the same time.

The following illustration describes a common application, which is for your reference only. You may connect them as required. After connection is complete, use a VS-2001-DEC or third-party decoder to view the intended application.

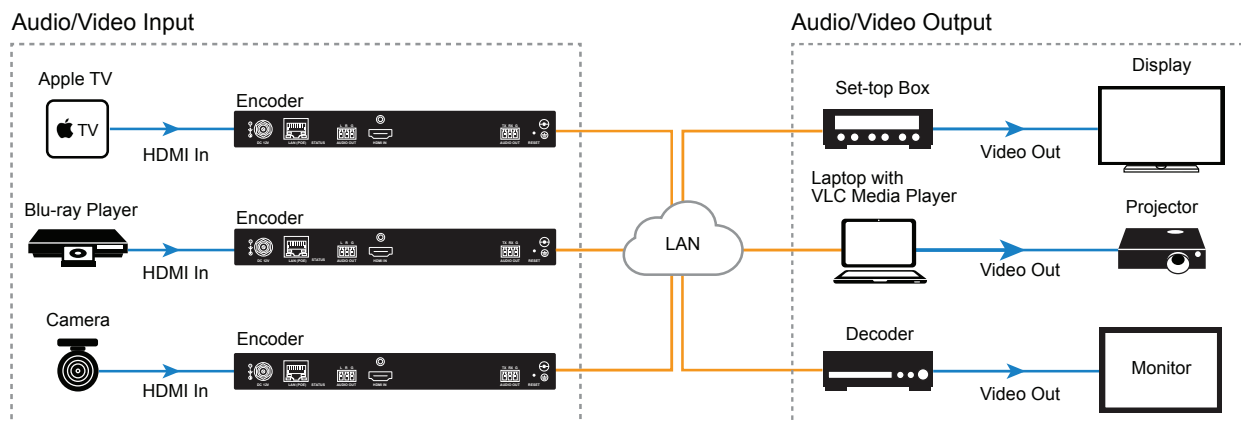


FIGURE 3-1. TYPICAL INSTALLATION USING VS-2001-DEC AND THIRD-PARTY DECODERS

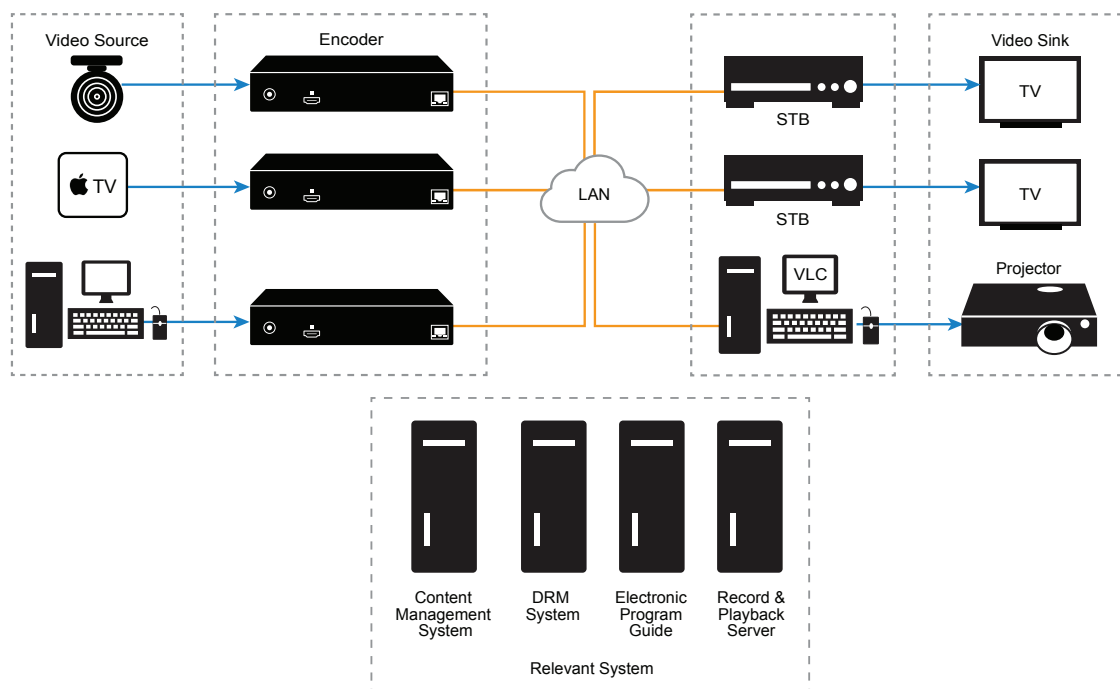


FIGURE 3-2. TYPICAL INSTALLATION USING ENCODER FOR IPTV

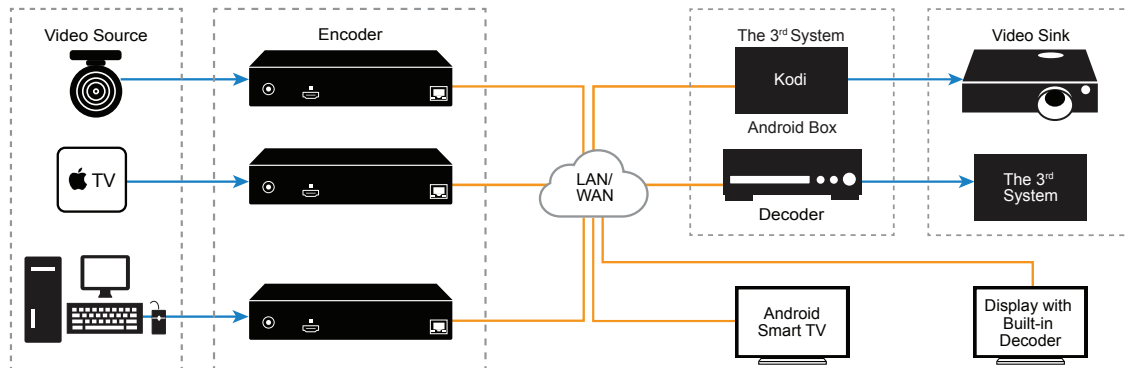


FIGURE 3-3. TYPICAL INSTALLATION USING THIRD-PARTY DEVICES

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

The Web UI designed for the VS-2001-ENC allows basic controls and advanced settings of the device. The web UI presented in this chapter is for reference only and subject to actual software change without notice.

4.1 LOGGING IN TO THE WEB-BASED CONFIGURATION PAGE

1. Make sure that your decoder, such as a VS-2001-DEC or a computer with a VLC media player, and VS-2001-ENC are on the same subnet.
2. Start a browser.
3. In the address bar, enter the device's IP address (default is 192.168.10.254.)
4. In the displayed login dialog box, enter the default password admin.
5. Click Login. The following page will display.

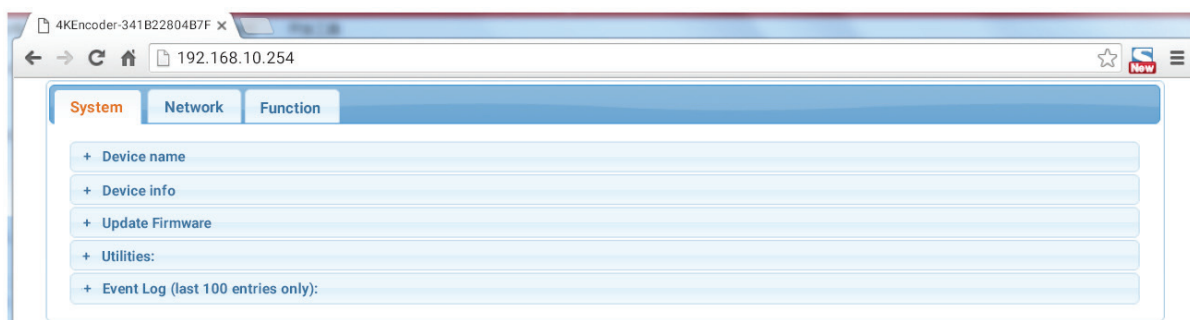


FIGURE 4-1. SYSTEM PAGE

NOTE: If you want your browser to remember your login password, select the check box next to Remember Password before login. If you forgot your login IP address and password, restore the VS-2001-ENC to its factory defaults, and then use the default settings. For more information, see the "Network" page and "Password" sections.

4.2 INTRODUCTION TO THE SYSTEM PAGE

The System Page includes five submenus:

- ♦ Device name
- ♦ Device info
- ♦ Update Firmware
- ♦ Utilities
- ♦ Event Log (last 100 entries only)

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.2.1 DEVICE NAME

— Device name

Device Name 4KEncoder-341B22804B7F

Note: Device Name must be 1–30 characters. (alphanumeric, '-' or '_' characters only).

Apply

FIGURE 4-2. DEVICE NAME PAGE

TABLE 4-1. DEVICE NAME PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
Device Name	Indicates the Device Name page, where you can change the device name.
Device Name field	Input a new device name. This name can be: • Displayed on the browser tab. • Displayed and used after bonjour automatic discovery of VS-2001-ENC. NOTE: The name must contain 1–30 characters, numbers, hyphen (-) or underscore (_), or their combinations.
Apply	Saves the current settings and applies them to the VS-2001-ENC.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.2.2 DEVICE INFO

Version info

Version: v6.0.1 2018/01/09 16:54:40

Network

Cast Ip Address: 224.16.75.127

Cast Ip Address Type: multicast

Cast Ip Port: 12350

Cast Mode: auto

Gateway: 0.0.0.0

Ip Addr: 192.168.10.254

Ip Mode: static

Netmask: 255.255.0.0

Stream info

Audio Encode Format: unknown

Audio Input: no

Audio Input Format: lpcm

HDCP: Disable

Rate Control: Disable

Transport Type: tsoverrtsp

URL: rtsp://192.168.10.254/live.sdp

Video Encode Info: rc mode: vbr, bitrate: 20000 kbps, profile: High Profile

Video Encode Timing: 0x0@0Hz

Video Input: no

Video Input Timing: 0x0@0Hz

FIGURE 4-3. DEVICE INFO PAGE



CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

TABLE 4-2. DEVICE INFO PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
Version Info	Indicates the device version and when the device software was built.
Network	Indicates the network parameters, e.g. cast IP address and type, cast IP port and mode, gateway, device IP address, IP mode and IP mode.
Stream Info	Indicates the stream parameters, e.g. the encode information for the input audio and video.
System Info	Indicates the memory and storage information of the device, and its inner operation system information.

4.2.3 UPDATE FIRMWARE

— Update Firmware:

File:

Note: The system will be automatically rebooted after the update has finished.

Browse

Apply

FIGURE 4-4. UPDATE FIRMWARE PAGE

TABLE 4-3. UPDATE FIRMWARE PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
File	Shows the upgrade file location on your local computer.
Browse	Browses for an upgrade file on your local computer.
Apply	Saves the current settings and applies them to the VS-2001-ENC. NOTE: The VS-2001-ENC will reboot automatically to make the settings take effect after upgrade process has completed.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.2.4 UTILITIES

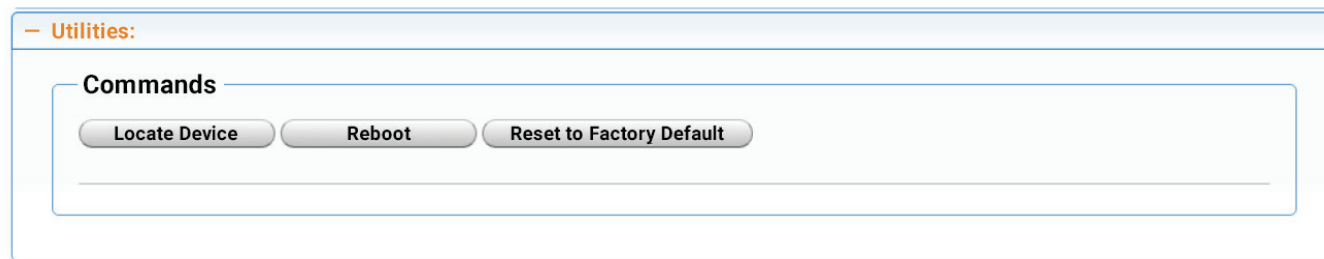


FIGURE 4-5. UTILITIES PAGE

TABLE 4-4. UTILITIES PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
Commands	Indicates the commands where you can reboot and restore the VS-2001-ENC to its factory defaults.
Locate Device	Locates the device. When you can't locate the device, click the "Locate Device" button to find which one will be shown when the Status indicator blinks for 10 seconds.
Reboot	Reboots the VS-2001-ENC.
Reset to Factory Default	Restores the VS-2001-ENC to its factory defaults.

4.2.5 EVENT LOG

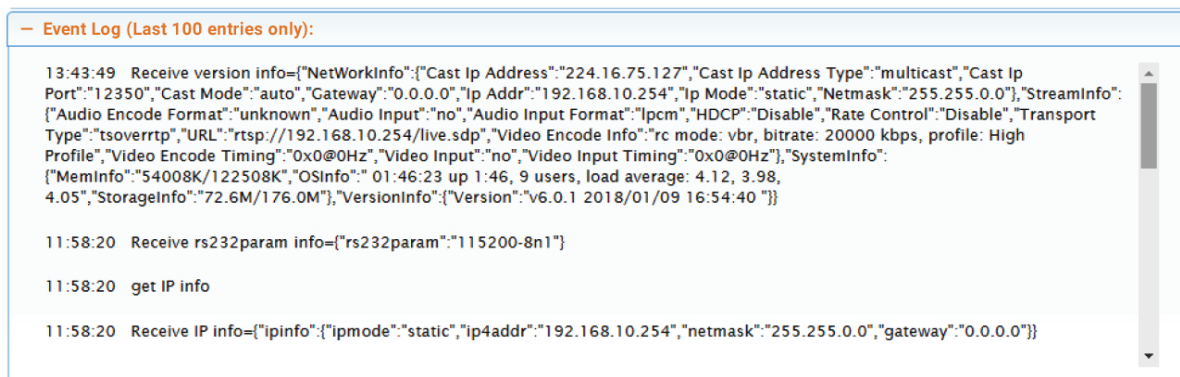


FIGURE 4-6. EVENT LOG PAGE

TABLE 4-5. EVENT LOG PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
Event Log	Indicates a log area for recording the information about device operations and communication. This can be used by technical engineers for troubleshooting.
Last 100 entries only	Indicates this log area can record up to 100 new events or messages.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.3 INTRODUCTION TO THE NETWORK PAGE

The Network page includes the following three submenus:

- ♦ IP Setup
- ♦ Password
- ♦ Casting Setup

4.3.1 IP SETUP PAGE

— IP Setup

IP Mode: Auto IP DHCP Static

IP Address:

Subnet Mast:

Default Gateway:

Note: After pressing Apply, please reboot the device for settings to take effect.

Apply

FIGURE 4-7. IP SETUP PAGE

TABLE 4-6. IP SETUP PAGE COMPONENTS

GUI ELEMENT	DESCRIPTION
IP Setup	Setup the IP mode (Static/DHCP/Auto IP), IP address, subnet mask and gateway. The default protocol is shown below. IP mode: Static IP address: 192.168.10.254 Subnet mask: 255.255.0.0 Gateway: 0.0.0.0
Apply	Saves the current settings and applies them to the VS-2001-ENC.

NOTE: If the network parameters are changed, reboot the VS-2001-ENC encoder for the changes to take effect.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.3.2 PASSWORD

FIGURE 4-8. PASSWORD SCREEN

TABLE 4-7. PASSWORD SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Password	Indicates the Password section where you can set a new password.
New Password	Input a new password. NOTE: The password must contain 4–16 letters, numbers or their combinations.
Apply	Click to save the current settings and apply them to the VS-2001-ENC.

4.3.3 CASTING SETUP

FIGURE 4-9. CASTING SETUP SCREEN

TABLE 4-8. CASTING SETUP SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Mode	Click to set the casting mode to Auto or Static. The default setting is "Static."
IP Address Type	Click to set the IP Address Type to Multicast or Unicast.
IP Address	Input an IP address. When you set the casting mode to Auto, this text box will be disabled.
IP Port	Input an IP port. When you set the casting mode to Auto, this text box will be disabled.
Apply	Click to save the current settings and apply them to the VS-2001-ENC.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.4 INTRODUCTION TO THE FUNCTION PAGE

The Function page includes the following four submenus:

- Video Settings
- Audio Settings
- Stream Settings
- Serial over IP

4.4.1 VIDEO SETTINGS

FIGURE 4-10. VIDEO SETTINGS SCREEN

TABLE 4-9. VIDEO SETTINGS SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Video	Indicates the Video Settings section where you can set HDCP in the HDMI input port and adjust video encoding parameters.
HDCP Support	Sets HDCP in the HDMI input port to meet different applications. • Enable: HDMI input port allows both HDCP-encrypted and non-HDCP source contents to pass through. • Disable: HDMI input port only allows non-HDCP source contents to pass through.
Max. bitrate (kbps)	Adjusts video encoding bit rates in the range of 2 Mbps to 30 Mbps.
Max. Resolution	Click the drop-down box to select the maximum output resolution (the options range from 2160p, 1080p, 720p, 576p to 480p) for VS-2001-ENC. The default setting is 2160p.
Max. Frame Rate	Input a number from 1 to 60 to set the maximum frame rate for VS-2001-ENC.
Apply	Saves the current settings and applies them to the VS-2001-ENC.

4.4.2 AUDIO SETTINGS

— Audio Settings

Encoder Parameters

Encode Type

lpcm

Apply

AAC Parameters

Encode Bitrate (kbps)

240

Apply

FIGURE 4-11. AUDIO SETTINGS SCREEN

TABLE 4-10. AUDIO SETTINGS SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Audio	Indicates the Audio Settings section where you can set an audio encoding type and bit rates.
Encode Type	Sets audio encoding type to LPCM or AAC.
Encode bitrate (kbps)	Selects an audio encoding bit rate for AAC (from drop-down options 32, 48, 64, 96, 128, 192 or 240 kbps).
Apply	Saves the current settings and applies them to VS-2001-ENC.



CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.4.3 STREAM SETTINGS

— Stream Settings	
Stream Video Over IP	Enable
Transport Type	tsoverrtp
Rate Limit Enable	Disable
Apply	

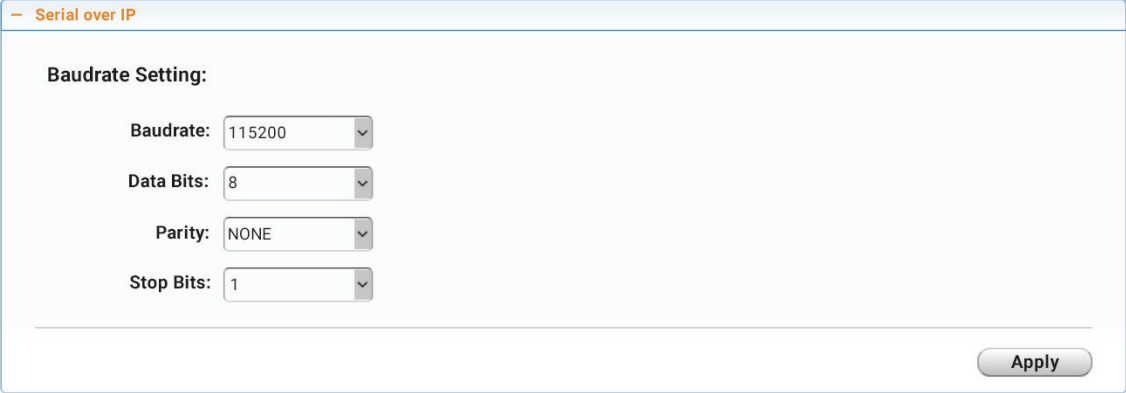
FIGURE 4-12. STREAM SETTINGS SCREEN

TABLE 4-11. STREAM SETTINGS SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Stream Setting	Indicates the Stream Settings section where you can set stream parameters.
Stream Video Over IP	Enables or disables an IP stream.
Transport type	Set the transport type to tsoverudp or tsoverrtp.
Rate Limit Enable	Enables or disables rate limit. When "Rate limit" is enabled, the device can smooth the output rate and make output data successfully pass through the network with the bandwidth limit.
Apply	Saves the current settings and applies them to the VS-2001-ENC.

CHAPTER 4: OPERATION VIA WEB-BASED CONFIG PAGE

4.4.4 SERIAL OVER IP SETTINGS



Serial over IP

Baudrate Setting:

Baudrate: 115200

Data Bits: 8

Parity: NONE

Stop Bits: 1

Apply

FIGURE 4-13. SERIAL OVER IP SETTINGS SCREEN

TABLE 4-12. SERIAL OVER IP SETTINGS SCREEN COMPONENTS

GUI ELEMENT	DESCRIPTION
Serial over IP	Indicates the Serial over IP section where you can set serial port parameters.
Baudrate	Set the serial port baudrate for VS-2001-ENC to 9600/57600/115200. Default setting is 115200.
Data Bits	Set the serial port data bit for VS-2001-ENC to 8/7/6/5.
Parity	Set the serial port parity to none/odd/even.
Stop bits	Set the serial port stop bits to 1 or 2.
Apply	Saves the current settings and applies them to VS-2001-ENC.

APPENDIX A: REGULATORY INFORMATION

A.1 FCC STATEMENT

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- ♦ Reorient or relocate the receiving antenna.
- ♦ Increase the separation between the equipment and receiver.
- ♦ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ♦ Consult an experienced radio/TV technician for help.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

A.2 CE AND ROHS2

This product complies with CE and ROHS2 certifications.

APPENDIX A: REGULATORY INFORMATION

A.3 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá de lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquear la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del equipo cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.



APPENDIX B: DISCLAIMER/TRADEMARKS

B.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

B.2 TRADEMARKS USED IN THIS MANUAL

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NOTES



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