BLACK BOX®

VS-2000-ENC

H.264 Encoder

User Manual

Contact Information

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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

This digital apparatus does not exceed the Class A 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 A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Normas Oficiales Mexicanas (NOM) Electrical Safety Statement INSTRUCCIONES DE SEGURIDAD

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 a 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 bloquea 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 deber 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 connectado 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 fisica 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 lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos 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: Objectos 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.

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Table of Contents

1. Specifications

Approvals	CE, FCC, RoHS compliant
Connectors	Video: Input: (1) HDMI IN, Output: (1) LAN (PoE), 10/100/1000BASE-T Audio: Input: (1) HDMI IN, Sampling Rate: 48 kHz, Compression and Bit Rate: LPCM (Fixed 1.6 Mbps), AAC (Configurable, 32 kbps, 48 kbps, 64 kbps, 96 kbps, 128 kbps, 192 kbps, 240 kbps) Output: (1) LAN (PoE), 10/100/1000BASE-T
Video Type	Input: HDMI 1.4; Output: H.264/MPEG-4 AVC
Input Video Signal	0.5–1.2 V p-p
Input DDC Signal	5 V p-p (TTL)
Video Impedence	100 ohms
Video Encoding Bit Rate	2 to 30 Mbps (configurable)
Resolutions (Input)	Input Video: HDMI Input: 640 x 480[8], 800 x 600[8], 1024 x 768[8], 1280 x 768[8], 1280 x 800[8], 1280 x 1024[8], 1360 x 768[8], 1366 x 768[8], 1440 x 900[8], 1400 x 1050[8], 1600 x 1200[8], 1680 x 1050[8], 1920 x 1200[8], 720 x 480[8] (480P), 720 x 576[6] (576P), 1280 x 720[5] (720P@30Hz), 1280 x 720[6] (720P@50Hz), 1280 x 720[8] (720P@60Hz), 1920 x 1080[2] (1080P@24Hz), 1920 x 1080[3] (1080P@25Hz), 1920 x 1080[5] (1080P@30Hz), 1920 x 1080[6] (1080P@50Hz), 1920 x 1080[8] (1080P@60Hz)

1. Specifications (continued)

Resolutions (Output)	Output Video: Ethernet output:640 x 480[8], 800 x 600[8], 1024 x 768[8], 1280 x 768[8], 1280 x 800[8], 1280 x 1024[8], 1360 x 768[8], 1366 x 768[8], 1440 x 900[8], 1400 x 1050[8], 1600 x 1200[8], 1680 x 1050[8], 1920 x 1200[8], 720 x 480[8] (480P), 720 x 576[6] (576P), 280 x 720[5] (720P@30Hz), 1280 x 720[6] (720P@50Hz), 1280 x 720[8] (720P@60Hz), 1920 x 1080[2] (1080P@24Hz), 1920 x 1080[3] (1080P@25Hz), 1920 x 1080[5] (1080P@30Hz), 1920 x 1080[6] (1080P@50Hz), 1920 x 1080[8] (1080P@60Hz)
Control:	
Control Method	LAN (Web GUI and Telnet)
Web Browser Supported	Internet Explorer, Microsoft Edge, Firefox, Chrome (Recommended)
General	
Operating Temperature/ Humidity	32 to 113° F (0 to 45° C), 10 to 90%, non-condensing
Storage Temperature/ Humidity	-4 to 140° F (-20 to 70° C), 10 to 90%, non-condensing
Power	12 VDC, 1 A
Power Consumption	10.5 W (Max.): powered by a power adapter; 15.4 W: powered by a piece of compatible PoE power source equipment
ESD Protection	Human body model: ±8kV (air-gap discharge) ±4kV (contact discharge)
Surge Protection	±1 kV

1. Specifications (continued)

General (continued)	
Dimensions	Product: 1.7"H x 14.2"W x 10.2"D (4.4 x 22 x 17.9 cm); Shipping Box: 3.3"H x 14.2"W x 10.2"D (8.5 x 36 x 26 cm)
Weight	2.6 lb. (1.2 kg)

2. Overview

2.1 Introduction

VS-2000-ENC is a live streaming media encoder that interfaces with HDMI signals for delivering media over IP networks. VS-2000-ENC can be used with a third-party decoder such as a set-top box, VLC or 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-2000-ENC employs 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-2000-ENC offers integration-friendly control features for LAN (Web GUI and Telnet) providing simple, flexible, control and management options.

By extending AV signals over networks, VS-2000-ENC significantly expands AV system capability.

2.2 Features

- Uses standards-based H.264/MPEG-4 AVC video compression.
- Supports HDMI input signals up to 1920 x 1200@60Hz, including Full HD1080P@60Hz — VS-2000-ENC supports a wide range of input resolutions, from standard definition up to the high resolutions.
- Supports one 10/100/1000BASE-T Ethernet PoE LAN output signal.
- Output resolutions follow input.
- 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.
- Streams HDMI signals over IP networks.
- 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 that enables a client entity to build a session and play the media content. Up to ten RTSP sessions can work simultaneously.
- LAN (Web GUI and Telnet) control — VS-2000-ENC is controllable over Ethernet, available for an intuitive web page control as well as Telnet CLI control using API commands.

- Uploads and encodes an idle pattern image file — Upload a BMP image file at resolution 1920 x 1080, encode it, and allow it to be decoded on a third-party decoder in times of no source received.
- Supports PoE to remotely power by a compatible power source equipment such as a PoE switch, eliminating the need for a nearby power outlet.
- Capable of outputting IP streams that can easily be decoded and viewed on third-party decoders. The multicast streams are output and can be received and decoded by multiple decoders.
- 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.
- Support 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-2000-ENC.
- 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.
- Rack-mountable 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

- (1) VS-2000-ENC
- (1) 12-VDC, 1-A power adapter
- (2) mounting ears

2.4 Hardware Description

Figures 2-1 and 2-2 show the front and back panels of the encoder. Table 2-1 describes the encoder's components.

Figure 2-1. VS-2000-ENC front panel.

Figure 2-2. VS-2000-ENC back panel.

Table 2-1. VS-2000-ENC components.

Number	Component	Status	Description
1	Power Indicator	ON	VS-2000-ENC is powered on.
		OFF	VS-2000-ENC is powered off.
2	Status Indicator	ON	VS-2000-ENC is encoding and there is at least one RTSP session
		OFF	VS-2000-ENC is not receiving video
		Blinks every two seconds.	VS-2000-ENC is encoding but there is no RTSP session
		Blinks for 10 seconds	VS-2000-ENC is executing a "locate device" command
3	Power input connector	Connected	Connects to the supplied 12-VDC, 1-A power adapter.
		Not connected	Unit powered via PoE.

NOTE: We recommend powering the VS-2000-ENC using either a power adapter or a PoE switch instead of using both at the same time. For example, if you use a power adapter, make sure that the PoE function of the connected switch's LAN port is disabled or use a non-PoE switch.

Table 2-1. (continued). VS-2000-ENC components.

Number	Component	Status	Description
4	Reset button (recessed)		When VS-2000-ENC 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..
• When the default settings are restored, your custom data is lost. Be careful when using the RESET button. • You can also restore VS-2000-ENC to its default settings using the web-based configuration page. For more information, see the Commands page section.			
5	(1) HDMI IN connector	Video Input	Attaches to an HDMI video source such as a Blu-ray player and a computer.
6	(1) LAN (PoE) connector 	Video Output	Links to an Ethernet switch for outputting IP streams. Default protocol: IP address: 192.168.10.254 Subnet mask: 255.255.0.0 DHCP: OFF Link speed and duplex level: Auto-detected
7	(1) LAN port Link LED (left)	ON/ OFF	This green LED lights to indicate a good network connection
8	(1) LAN port Activity LED (right)	ON/ OFF	This yellow LED lights to indicate network activity.

NOTE: If you use a PoE Ethernet switch, the VS-2000-ENC can be powered by this switch, eliminating the need for a nearby power outlet.

If the PoE switch is unable to provide enough power, connect the VS-2000-ENC to the supplied power adapter and disable the PoE function of the connected LAN port in the switch.

3. Hardware Installation

WARNING:

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

During the installation, do not connect the VS-2000-ENC via PoE to a power source equipment and its power adapter at the same time.

The following illustration describes a common application. Your application may vary. After connection is complete, use a third-party decoder to view the intended application.

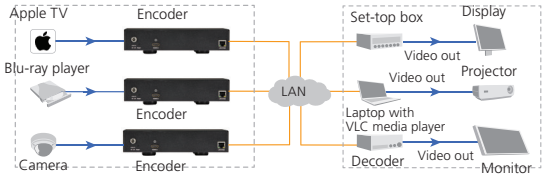

Figure 3-1. Typical installation.

4. Operation

4.1 Logging In to the Web-based Configuration Page

1. Make sure that your decoder (for example, a computer with a VLC media player) and VS-2000-ENC are on the same subnet.
2. Start a browser.
3. In the address bar, enter the default IP address 192.168.10.254.
4. In the displayed login dialog box, enter the default password "admin".
5. Click Login.

NOTE: If you want your browser to remember your login password, select the check box next to "Remember Password" before login.

If you forgot the login IP address and password, restore the VS-2000-ENC to its factory defaults, and then use the default settings. For more information, see Section 4.3.2, Network Page, and Section 4.3.3, Password Page.

4.2 Introduction to Functions Page

4.2.1 Video Page

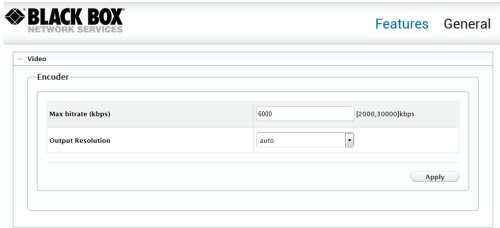

Figure 4-1. Video page.

Table 4-1. Video page elements.

GUI Element	Description
Video	Indicates the Video page where you can set the resolution for the HDMI input port and adjust video encoding bit rates.
Max bitrate (kbps)	Adjusts video encoding bit rates in the range of 2 Mbps to 30 Mbps.
Apply	Saves the current settings and applies them to VS-2000-ENC.

4.2.2 Audio Page

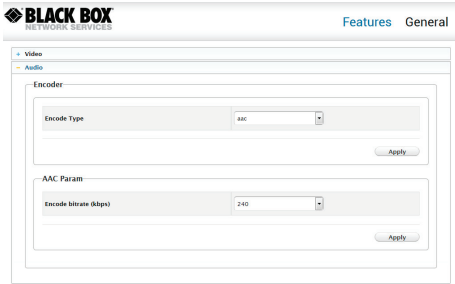

Figure 4-2. Audio page.

Table 4-2. Audio page elements.

GUI Element	Description
Audio	Indicates the Audio page where you can set an audio encoding type and bit rates.
Encode Type	Sets an audio encoding type LPCM or AAC.
Encode bitrate (kbps)	Selects an audio encoding bit rate for AAC.
Apply	Saves the current settings and applies them to the VS-2000-ENC.

4.2.3 TS Parameter Page

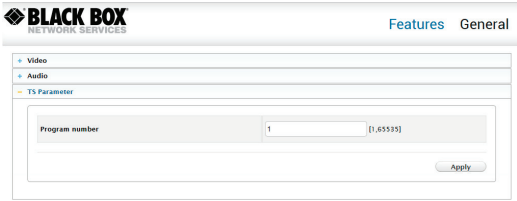

Figure 4-3. TS Parameter page.

Table 4-3. TS Parameter page elements.

GUI Element	Description
TS Parameter	Indicates the TS Parameter page where you can set a program number.
Program number	Selects a program number in the range of 1 to 65535.
Apply	Saves the current settings and applies them to the VS-2000-ENC.

4.2.4 Stream Page

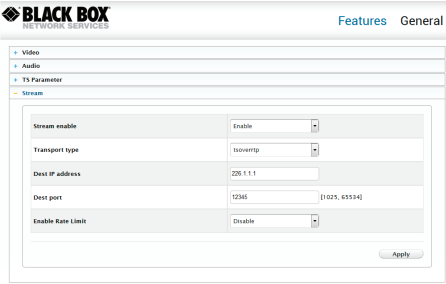

Figure 4-4. Stream page.

Table 4-4. Stream page elements.

GUI Element	Description
Stream	Indicates the Stream page where you can set stream parameters.
Stream enable	Enables or disables an IP stream.
Transport type	Selects a transport type tsoverudp or tsoverrtp.
Dest IP address	Sets a unicast or multicast address as required.
Dest port	Sets a unicast or multicast port number in the range of 1025 to 65534.
Apply	Saves the current settings and applies them to the VS-2000-ENC.

4.2.5 Log Page

Figure 4-5. Log page.

Table 4-5. Log page elements.

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

4.3 Introduction to System Page

4.3.1 Device Name Page

Figure 4-6. Device Name page.

Table 4-6. Device Name page elements.

GUI Element	Description
Device Name	Indicates the Device Name page, where you can change the device name.
Device Name	Inputs a new device name. This name can be: Displayed on the browser tab. Displayed and used after bonjour automatic discovery of the VS-2000-ENC. NOTE: The name must contain 1–20 letters, numbers, hyphen (-) or underscore (_), or their combinations.
Apply	Saves the current settings and applies them to the VS-2000-ENC.

4.3.2 Network Page

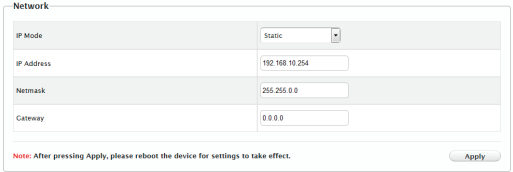

Figure 4-7. Network page.

Table 4-7. Network page elements.

GUI Element	Description
Network	Indicates the Network page where you can set the network parameters IP mode (Static or DHCP), 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-2000-ENC.

4.3.3 Password Page

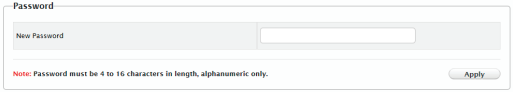

Figure 4-8. Password page.

Table 4-8. Password page elements.

GUI Element	Description
Password	Indicates the Password page where you can set a new password.
New Password	Inputs a new password. The default is admin. *NOTE: The password must contain 4–16 letters, numbers, or their combinations.*
Apply	Saves the current settings and applies them to the VS-2000-ENC.

4.3.4 Idle Pattern Picture Page

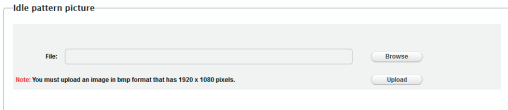

Figure 4-9. Idle Pattern Picture page.

Table 4-9. Idle Pattern Picture page elements.e

GUI Element	Description
Idle pattern picture	Indicates the Idle Pattern Picture page where you can set the VS-2000-ENC to encode an uploaded image and display it on a third party decoder when no active source is available.
File	Shows the uploaded image location on your local computer.
Browse	Browses for an image on your local computer. NOTE: You must upload an image in bmp format that has 1920 x 1080 pixels.
Upload	Uploads the local image to the VS-2000-ENC.

4.3.5 Upgrade Page

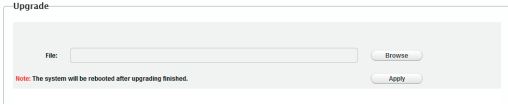

Figure 4-10. Upgrade page.

Table 4-10. Upgrade page elements.

GUI Element	Description
Upgrade	Indicates the Upgrade page where you can upgrade VS-2000-ENC to another version
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-2000-ENC. *NOTE: VS-2000-ENC reboots automatically to make the settings take effect after upgrade process has completed.*

4.3.6 Version Info Page

Figure 4-11. Version Info page.

Table 4-11. Version Info page elements.

GUI Element	Description
Version info	Indicates the Version Info page where you can view the device information
Model	Indicates the device model.
Build Time	Indicates the time and date when the device software was built.

4.3.7 Commands Page

Figure 4-12. Commands page.

Table 4-12. Commands page elements.

GUI Element	Description
Commands	Indicates the Commands page where you can reboot and restore VS-2000-ENC to its factory defaults.
Reboot	Reboots VS-2000-ENC.
Reset to Factory Default.	Restores VS-2000-ENC to its factory defaults.

Appendix A: API Commands

A.1 Introduction

The encoder offers one Ethernet port LAN, which allows you to control and manage this device via API commands.

A.2 Preparation

A third-party device is required to be connected to the VS-2000-ENC network and to log in to the encoder before implementing API commands to control and manage it. In this section, a command line interface (CLI) on Windows 7 is used as an example.You may also use other third-party devices. For more information, see below.

A.2.1 Setting the IP Address on Your Computer

First ensure that your computer with CLI and VS-2000-ENC are on the same subnet. By default, network settings in VS-2000-ENC's LAN (PoE) port are 192.168.10.254/255.255.0.0. You can set your computer's IP address in the 192.168.x.x range with a subnet mask of 255.255.0.0.

A.2.2 Enabling Telnet Client

After setting your computer with CLI and VS-2000-ENC to be on the same subnet, make sure that Telnet Client is enabled on your computer. By default, a Telnet Client is disabled on Windows 7. To turn on a Telnet Client, do as follows:

1. Choose Start > Control Panel > Programs.
2. In Programs and Features area box, click Turn Windows features on or off.
3. In Windows Features dialog box, select Telnet Client check box.

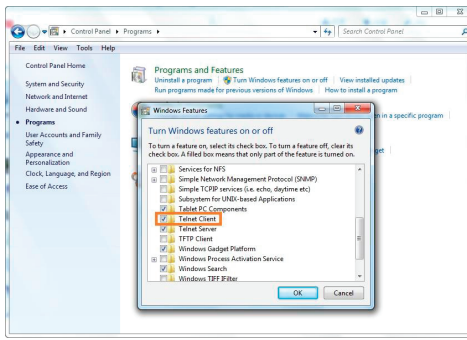

Figure A-1. Windows features dialog box

A.2.3 Logging In to the Encoder via a Command-Line Interface

Now you can log in to the CLI by performing the procedures in the order presented.

1. Choose Start > Run.
2. In the Run dialog box, enter cmd then click OK.

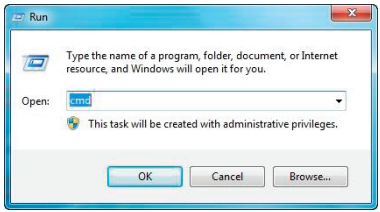

Figure A-2. Run dialog box

3. Enter telnet 192.168.10.254 24, and then press Enter.

NOTE: 192.168.10.254 is the VS-2000-ENC's default IP address and may vary depending on the actual settings. 24 is the default port number.

Figure A-3. Telnet screen

4. Enter root, and then press Enter.

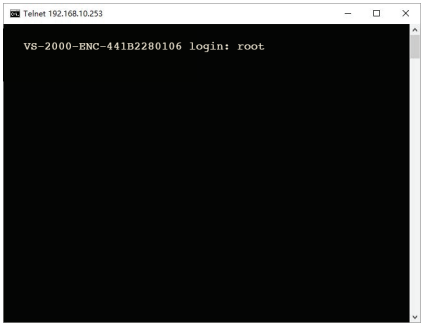

Figure A-4. login screen

5. Use the command line interface below to perform API commands.

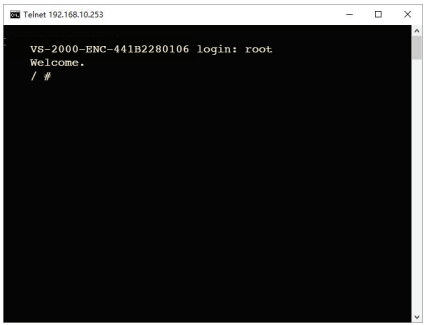

Figure A-5. Command-Line Interface screen

A.3 Commands Overview

A.3.1 gbconfig command

A script file named "gbconfig"is responsible for most of the API commands and is invoked as a console command. By assigning different arguments to this script file via API commands, a third-party device can query and alter the encoder's configurations.

The following table lists all the gbconfig commands in this guide.

Table A-1. gbconfig commands summary

Command	Description
gbconfig --name	Configures the decoder name.
gbconfig --vbr-max-bit-rate	Configures the bit rate for encoding video
gbconfig --ip-mode	Configures the IP mode by which the decoder acquires an IP address
gbconfig --ip4-addr	Configures an IP address with static IP mode
gbconfig --net-mask	Configures the subnet mask with static IP mode
gbconfig --gateway-ip	Configures the gateway with static IP mode
gbconfig --audio-enc-type	Configures the audio encoding mode
gbconfig --aac-enc-bitrate	Configures the AAC encoding bitrate
gbconfig --stream-enable	Enables or disables the output IP stream
gbconfig --program number	Configures the program number
gbconfig --media-transport	Configures the TS streaming transmission format

Table A-1 (continued). gbconfig commands summary

Command	Description
gbconfig --media-dest-ip	Configures the destination IP address of the output IP stream
gbconfig --enc-resolution	Configures the video resolution of the output IP stream
gbconfig --rate-limit-enable	Enable or disable the data rate limit for the output IP stream
gbconfig -s, --show	Queries the response of a implemented API command or the current state of configuration
gbconfig -h, --help	Shows a brief introduction to the gbconfig command sets
gbcontrol --blink-led	Control the encoder to twinkle the status indicator

A.3.2 gbshow command

A script file name "gbshow" is responsible for some API commands and is invoked as a console command. By assigning different arguments to this script file via API commands, a third-party device can query runtime status information.

The following table lists all the gbshow commands in this guide.

Table A-2. gbshow commands summary

Command	Description
gbshow --version	Query the version of the running firmware
gbshow --macaddr	Query the MAC address of the device
gbshow --input-resolution	Query the resolution of the input video
gbshow -output-resolution	Query the resolution of the output video
gbshow -input-audio	Query the resolution of the input audio
gbshow --output-audio	Query the resolution of the output audio
gbshow--uptime	Query the elapsed time from the latest boot to now
gbshow--boot-times	Query the counter of the boot times

A.4 gbconfig Command Set

NOTE: In this guide, " " represents a carriage return and a line feed input manually.

A.4.1 gbconfig –name

Request	gbconfig --name namestring
Response	Returns nothing
Description	Configures the encoder name, which is displayed and used after bonjour automatic discovery of the encoder. Reboot encoder for this operation to take effect. The default device name is "VS-2000-ENC-XXXXXXXXXXXX" in which "XXXXXXXXXXXX" is the encoder MAC address.

NOTE: "namestring" can only include letters, digits, "-" (hyphen) and "_" (underscore).

Example:

To change the device name to "MyVS-2000-ENC", do as follows.

Request: gbconfig --name MyVS-2000-ENC

Response: [Returns nothing]

A.4.2 gbconfig –vbr-max-bitrate

Request	gbconfig --vbr-max-bitrate VideoEncBitRate
Response	Returns nothing
Description	Configures the bitrate for encoding video.

NOTE: "VideoEncBitRate" is bitrate ranging from 2000 kbps to 30000 kbps. The default is 20000 kbps.

Example:

To change the bitrate to 10 Mbps, do as follows.

Request: gbconfig --vbr-max-bitrat 10000

Response: [Returns nothing]

A.4.3 gbconfig --ip-mode

Request	gbconfig --ip-mode {static/dhcp}
Response	Returns nothing
Description	Configures the IP mode by which the encoder acquires an IP address. The encoder supports static IP and DHCP modes and is set to static IP by default. Reboot the encoder for this operation to take effect.

NOTES:

- *"static" sets the encoder to static IP. "dhcp" sets the encoder to DHCP.*
- *To ensure that the encoder works properly using static IP, correctly set its IP address and subnet mask.*
- *To ensure that the encoder works properly using DHCP, an available DHCP server is required on the network to assign an IP address to the encoder.*

Example:

To set the encoder to DHCP, do as follows.

Request: gbconfig --ip-mode dhcp

Response: [Returns nothing]

A.4.4 gbconfig --ip4-addr

Request	gbconfig --ip4-addr ip4addr
Response	Returns nothing
Description	Configure an IP address with static IP mode. This configuration is used in static IP mode and takes effect after the encoder is rebooted.

NOTE: "ip4addr" is the decoder's IP address. The default is 192.168.10.254.

Example:
To assign IP address 192.168.2.11 to the encoder, do as follows.
Request: gbconfig --ip4-addr 192.168.2.11
Response: [Returns nothing]

A.4.5 gbconfig --net-mask

Request	gbconfig --net-mask netmask
Response	Returns nothing
Description	Configures the subnet mask with a static IP mode. This configuration is used in static IP mode and takes effect after the encoder is rebooted.

NOTE: "netmask" is the decoder's subnet mask. The default is 255.255.0.0.

Example: To assign subnet mask 255.255.255.0 to the encoder, do as follows.
Request: gbconfig --net-mask 255.255.255.0
Response: [Returns nothing]

A.4.6 gbconfig --gateway-ip

Request	gbconfig --gateway-ip gateway
Response	Returns nothing
Description	Configures the gateway with static IP mode. This configuration is used in static IP mode and takes effect after the encoder is rebooted. The encoder can work well without any network gateway, so it is optional for the static IP mode and has no default.

NOTE: "gateway" is the decoder's gateway. The default is blank.

Example: To assign gateway 192.168.1.1 to the encoder, do as follows.
Request: gbconfig --gateway-ip 192.168.1.1
Response: [Returns nothing]

A.4.7 gbconfig --audio-enc-type

Request	gbconfig --audio-enc-type
Response	Returns nothing
Description	Configures the audio encoding mode. The available modes are LPCM (default) and AAC.

NOTE: "lpcm" sets to LPCM encoding mode. "aac" sets to AAC encoding mode.

Example: To set the encoder to the AAA encoding mode, do as follows.
Request: gbconfig --audio-enc-type aac
Response: [Returns nothing]

A.4.8 gbconfig --aac-enc-bitrate

Request	gbconfig --aac-enc-bitrate
Response	Returns nothing
Description	Configures the audio encoding bitrate. The configuration takes effect only when the audio encoding mode is AAC.

NOTE: The selectable bitrates are 32, 48, 64, 96, 128, 192, and 240 kbps. The default is 240 kbps.

Example: To set the audio encoding bitrate to 128, do as follows.
Request: gbconfig --aac-enc-bitrate 128
Response: [Returns nothing]

A.4.9 gbconfig --stream-enable

Request	gbconfig --stream-enable {y|}
Response	Returns nothing
Description	Enables or disables the output IP stream. By default, the IP stream is enabled. When it's disabled, the encoder stops encoding video and audio.

NOTE: "y" enables output IP stream; "n" disbales output IP stream.

Example: To enable the output IP stream, do as follows.
Request: gbconfig --stream-enable y
Response: [Returns nothing]

A.4.10 gbconfig --program-number

Request	gbconfig --program-number *ProgramNumberVal*
Response	Returns nothing
Description	Configures the program number that may be used in the PAT, PMT, and other relevant PSI tables of the transport stream. Once this configuration is altered, the version field of the PAT and PMT will increase. The SSRC field of the RTP header will change, too, so that the decoder will be aware of the change.

NOTE: "ProgramNumberVal" is the program number ranging from 1 to 65535. The default is 1.

Example: To change the program number to 2, do as follows.

Request: gbconfig --program-number 2

Response: [Returns nothing]

A.4.11 gbconfig --media-transport

Request	gbconfig --media-transport *{tsoverudp|tsoverrtp}*
Response	Returns nothing
Description	Configures the TS streaming transmission format. The encoder supports two formats: TS over UDP (the TS frames are packed into the UDP packets directly) and TS over RDP (the TS frames are packed with RTP specification and the RTP datas is packed into UDP packets). The default is TS over RDP.

NOTES:

- *"tsoverudp" sets TS streaming transmission format to TS over UDP.*
- *"tsoverrtp" sets TS streaming transmission format to TS over RTP.*

Example: To change the TS streaming transmission format to TS over UDP, do as follows.

Request: gbconfig --media-transport *tsoverudp*

Response: [Returns nothing]

A.4.12 gbconfig --media-dest-ip

Request	gbconfig --media-dest-ip *MediaIpAddr*
Response	Returns nothing
Description	Configures the destination address of the output IP stream. If a multicast IP address is designated, the encoder transmits the stream with multicast mode. If a unicast IP address is designated, unicast mode is used.

NOTE: "MediaIpAddr" is the destination IP address of a multicast or unicast mode. The default is a a multicast IP address 226.1.1.1.

Example: To use a multicast IP address 226.1.1.2, do as follows.

Request: gbconfig --media-dest-ip *226.1.1.2*

Response: [Returns nothing]

A.4.13 gbconfig --media-dest-port

Request	gbconfig --media-dest-port *MediaPort*
Response	Returns nothing
Description	Configures the destination port of the output IP stream.

NOTE: "MediaPort" is the destination port ranging from 1025 to 65534. The default is 12300. A port of even number is recommended for RTP transmission mode.

Example: To use the port 12000, do as follows.

Request: gbconfig --media-dest-port *12000*

Response: [Returns nothing]

A.4.14 gbconfig --enc-resolution

Request	gbconfig --enc-resolution *{auto|480p|576p|720p60|1080p30|1080p690}*
Response	Returns nothing
Description	Configures the video resolution of the output IP stream.

NOTE: "With the value "auto," the output resolution is the same as the input resolution. This is the default.

Example: To use the resolution 480p, do as follows.

Request: gbconfig --enc-resolution *480p*

Response: [Returns nothing]

A.4.15 gbconfig --rate-limit-enable

Request	gbconfig --rate-limit-enable *{y|n}*
Response	Returns nothing
Description	Enable or disable data rate limit for the output IP stream.

NOTE: When the data rate limit is enabled, the encoder will transmit encoded media data with a constant data rate to avoid instant peak rate, so that the media stream can pass through the link that has strict bandwidth limit, such as a private line leased from the telecommunicatios operator. As a side effect, latency will increase slightly.

With the factory default, the data rate limit is disabled.

Example: To enable data rate limit, do as follows.

Request: gbconfig --rate-limit-enable *y*

Response: [Returns nothing]

A.4.16 gbconfig –s

Request	gbconfig {-s/--show} param
Response	Returns a response based on the actual configuration
Description	Queries the response of a implemented API command or the current state of configuration.

NOTES:

- *Either "-s" or "--show" is available for use. "-s" is short for "--show" for easy operation.*
- *"param" is the name of a configuration item such as "--name" in "gbconfig --name".*

Example: To query the encoder's name, do as follows.

Request: gbconfig -s ----name

Response: MyVS-ENC-2000

A.4.17 gbconfig –h

Request	gbconfig {-h/--help}
Response	A brief introduction to the gbconfig command sets. *NOTE: Either "-h" or "--help" is available for use. "-h" is short for "--help" for easy operation.*
Description	Shows a brief introduction to the gbconfig command sets

Example: To show a brief introduction to the gbconfig command sets, do as follows.

Request: gbconfig -h

Response:

Usage: gbconfig [options]

Options:

--name=[VALUE]	localname for bonjour
--ip-mode[=VALUE]	[dhcp/static]
--ip4-addr[=VALUE]	ip4 addr
--net-mask[=VALUE]	ip4 netmask
--gateway-ip[=VALUE]	gateway ip
--encoder-ip [=VALUE]	encoder ip addr
-s, --show	show the value for the specified items
-h, --help	show this message

Example:

gbconfig --name MyEncoder

gbconfig --ip-mode=static --ip4-addr=192.168.1.11 --net-mask=255.255.0.0

gbconfig -s --name

gbconfig --show --ip4-addr --net-mask

A.5 gbcontrol Command Set

A script file named "gbcontrol" is responsible for some API commands and is invoked as a console command. By assigning different arguments to this script file via API commands, a third-party device can control the encoder.

A.5.1 gbcontrol --blink-led

Request	gbcontrol --blink-led
Response	Returns nothing
Description	Control the encoder to flash the status indicator. Once it receives this command, the encoder will flash its status indicator with the frequency of 5 Hz during the following 10 seconds. This feature is designed for the user to find the physical position of a certain encoder.

Example: To make the encoder flash the LED, do as follows.

Request: gbcontrol --blink-led

Response: [Returns nothing]

A.6 gbshow Command Set

A.6.1 gbshow--version

Request	gbshow--version
Response	The version of the running firmware
Description	Query the version of the running firmware

Example:

Request: gbshow--version

Response: v1.2.1

A.6.2 gbshow--macaddr

Request	gbshow--macaddr
Response	The MAC address of the device being operated
Description	Query the MAC address of the device

Example:
Request: gbshow--macaddr
Response: 34:18:22:FF:FF:C4

A.6.3 gbshow--input-resolution

Request	gbshow--input-resolution
Response	The resolution of the input video
Description	Query the resolution of the input video. The response is a string like 1366_768_60 or 720p_60, which represents the timing of the input video.

Example:
Request: gbshow--input-resolution
Response: 1366_768_60

A.6.4 gbshow--output-resolution

Request	gbshow--output-resolution
Response	The resolution of the output video
Description	Query the resolution of the output video. The response is a string like 1366_768_60 or 720p_60, which represents the timing of the input video.

Example:

Request: gbshow--output-resolution

Response: 1366_768_60

A.6.5 gbshow--input-audio

Request	gbshow--input-audio
Response	The resolution of the input audio
Description	Query the resolution of the input audio. The encoder can only process LPCM audio input so the response is fixed at lpcm.

Example:

Request: gbshow--input-audio

Response: lpcm

A.6.6 gbshow--output-audio

Request	gbshow--output-audio
Response	The resolution of the output audio
Description	Query the resolution of the output audio. There are two possible responses: lpcm, aac.

Example:
Request: gbshow--output-audio
Response: aac

A.6.7 gbshow--uptime

Request	gbshow--uptime
Response	A integer representing the time elapsed since the latest boot.
Description	Query the time elapsed since the latest boot. The unit is seconds.

Example:
Request: gbshow--uptime
Response: 1888

A.6.8 gbshow--boot-times

Request	gbshow--boot-times
Response	The counter of the boot times.
Description	Query the counter of the boot times. The counter will reset after you restore the factory default from the web UI.

Example:
Request: gbshow--boot-times
Response: 15

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