

# USER MANUAL

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VS-2101X

# H.264/H.265 HDMI OVER IP ENCODER/DECODER

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24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT [BLACKBOX.COM](http://BLACKBOX.COM)



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## SAFETY PRECAUTIONS

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

- ♦ Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- ♦ Follow basic safety precautions to reduce the risk of fire, electrical shock, and personal injury.
- ♦ Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- ♦ Using supplies or parts not meeting the product's specifications may cause damage, deterioration, or malfunction.
- ♦ Refer all servicing to qualified service personnel.
- ♦ To prevent fire or shock hazard, do not expose the unit to rain or moisture. Do not install this product near water.
- ♦ Do not put any heavy items on the extension cable in case of extrusion.
- ♦ Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- ♦ Install the device in a location with sufficient ventilation to avoid damage caused by overheating.
- ♦ Keep the module away from liquids.
- ♦ Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on the housing, unplug the module immediately.
- ♦ Do not twist or pull the cable ends by force. Doing so can cause a malfunction.
- ♦ Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- ♦ Unplug the power cord when left unused for an extended period of time.
- ♦ Information on disposal for scrapped devices: do not burn or mix with general household waste. Treat as normal electrical waste.
- ♦ Use #4-40 x 5/8 Phillips pan head self-tapping screws for optional wall mounting of unit.



TABLE 1-1 VS-2101X SPECIFICATIONS

SPECIFICATION	DESCRIPTION
<b>Video Input</b>	
Input Video Connector	(1) HDMI Type A
Input Video Type	(1) HDMI 2.0
Supported Input Resolutions	1920 x 1200 at 60 Hz 4:4:4
Input Video Signal	0.5 -1.2 V p-p
Input DDC Signal	5 V p-p (TTL)
Video Impedance	100 Ohms
<b>Streaming</b>	
Video Encoding Bit Rate	Configurable
Streaming Port	(1) LAN (PoE), 10/100/1000BASE-T
Stream Video Type	H.264/MPEG-4 AVC/HEVC/H.265
Streaming Video Resolutions	Timing: H.264: Up to 1920 x 1200 at 60 Hz 4:2:0 H.265: Up to 1920 x 1200 at 60 Hz 4:2:0 Audio: Encoding: AAC Sampling Rate: 48 kHz Bitrate: < or = 240 kbps (AAC) Delivery: Multiple streams supported Transmission Method: unicast, multicast, RTP over RTSP, RTP over UDP/TCP Session
Latency	Low latency 180ms for 1080P@60
Network Switch	Multicast, IGMP V2
<b>Video Output</b>	
Output Video Port	(1) HDMI Type A
Output Video Type	HDMI 2.0
Supported Video Resolutions	HDMI: up to 1920 x 1200 at 60 Hz 4:4:4 Audio: LPCM, 48 kHz
Sampling Rate	48 kHz
<b>Analog Audio Output</b>	
Max. Audio Level	2 Vrms
THD+N	<0.1% at 1 kHz
SNR	> 70 dB at 1 kHz
Frequency Response	± 3 dB 20 Hz to 20 kHz
Crosstalk	<-60 dB at 1 kHz
Impedance	470 ohms
Type	Unbalanced
<b>Control</b>	
Control Connectors	(1) RJ-45, 10/100/1000BASE-T Ethernet port
Control Method	Web UI

## CHAPTER 1: SPECIFICATIONS

**TABLE 1-1 VS-2101X SPECIFICATIONS CONTINUED**

SPECIFICATION	DESCRIPTION
IP Address	DHCP/Static/Auto IP
<b>Mechanical</b>	
Indicators	(4) LEDs: (1) Power, (1) Status, (2) RJ-45
User Control	(1) ID Mode button
Enclosure	Chassis Material: Metal (Steel); Chassis Color Black
Material	Anodized aluminum
Dimensions	Case only: 0.98" H x 9.1" W x 4.3" D (2.5 x 23.1 x 10.8 cm); All inclusive: 0.98" H x 9.1" W x 4.6" D (2.5 x 23.1 x 11.7 cm)
Power	(1) 5V/3A DC (Locking) (Level 6: EN62368-1) power connector POE AF mode (48V, 0.25A)



## CHAPTER 2: OVERVIEW

### 2.1 INTRODUCTION

The H.264/H.265 HDMI over IP Encoder/Decoder delivers live-stream, visually lossless quality video and high-quality audio over IP. This VS-2101X is an HDMI over H.264/H.265 transceiver. This means it can be used as an encoder or a decoder based on the mode selected. It features one HDMI input, one HDMI output, and one Ethernet port for simplified integration into your AV system. In encoder mode, the HDMI input will be encoded to H.264/H.265 and sent out the Ethernet port. In decoder mode, the H.264/H.265 data will be decoded from the Ethernet port and sent out the HDMI output.

### 2.2 FEATURES

- Uses one HDMI input, one HDMI output, and one Ethernet port
- Works in encoder or decoder mode
- Control via web UI
- Consumes low bandwidth
- Delivers content with visually lossless quality
- Supports AAC audio encoding to transmit high-quality audio

### 2.3 WHAT'S INCLUDED

- (1) Transceiver
- (1) 5V-DC, 3A power adapter (with changeable plug for US, UK, EU, and AU)

2.4.1 FRONT PANEL

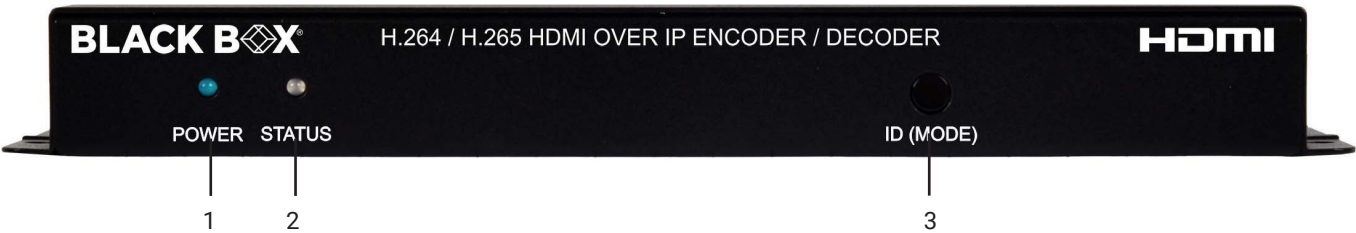


FIGURE 2-1: FRONT PANEL

TABLE 2-1 FRONT PANEL COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
1	Power	Blue: Unit ON. OFF: Unit OFF.
2	Status	Green: Encoder mode Amber: Decoder mode OFF: Unit is not in the normal working state.
3	ID (Mode)	Press to display information, such as device IP address or ID, OSD. Press for five seconds to change encoder/decoder mode.

2.4.2 REAR PANEL

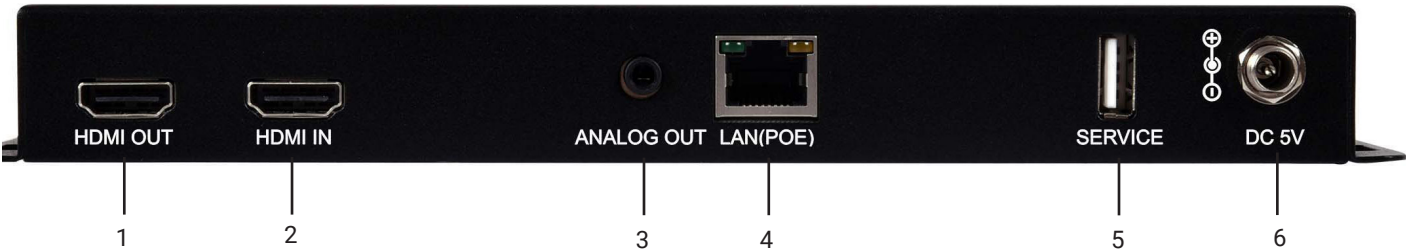


FIGURE 2-2: REAR PANEL

TABLE 2-2 REAR PANEL COMPONENTS

NUMBER IN FIGURE 2-2	COMPONENT	DESCRIPTION
1	HDMI OUT	1920x1200 @60Hz 4:4:4 Supports HDMI bypass out on encoder mode
2	HDMI IN	1920x1200 @60Hz 4:4:4
3	Analog Out	3.5mm phone jack Extracting audio from video at decoder mode.
4	1G LAN	Control and streaming; 1920x1200 @60Hz 4:2:0
5	Service	Offline firmware update
6	Power	5V/3A DC (Locking) POE (Power Over Ethernet) Level 6; EN62368-1

## CHAPTER 3: OPERATION

### 3.1 LOGIN SCREEN

The transceiver default mode is encoder, and the default IP address is 192.168.1.51. When the mode is changed to decoder, the default IP address is 192.168.1.50.

After entering your Username and password on the login screen, click on the Submit button.

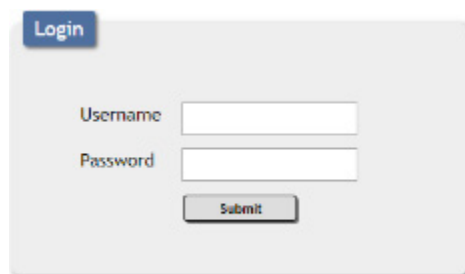
A login screen with a blue 'Login' button at the top left. Below it are two input fields: 'Username' and 'Password'. At the bottom is a 'Submit' button.

FIGURE 3-1: LOGIN SCREEN

Default username: admin

Default password: admin

### 3.2 SYSTEM TAB

This section provides information and control over the unit's operational mode, device name, and network configuration. Options for updating the firmware, saving/restoring the unit's configuration, and performing a factory reset are also provided.

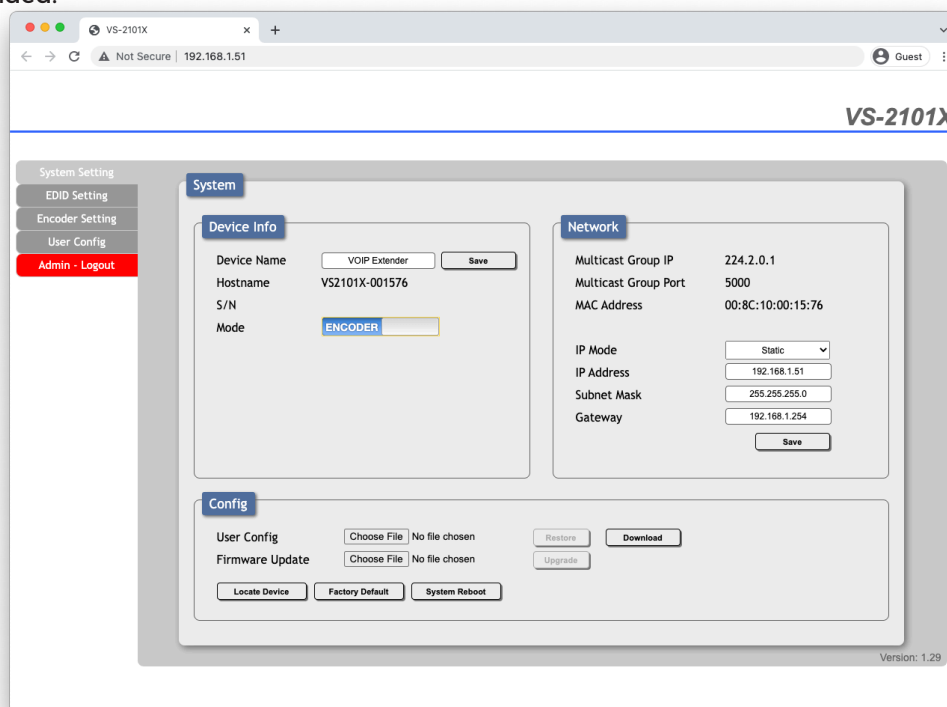
A screenshot of the VS-2101X web interface. The browser address bar shows '192.168.1.51'. The page title is 'VS-2101X'. On the left is a sidebar with 'System Setting', 'EDID Setting', 'Encoder Setting', 'User Config', and 'Admin - Logout'. The main content area is titled 'System' and contains two tabs: 'Device Info' and 'Network'. The 'Device Info' tab shows fields for 'Device Name' (VOIP Extender), 'Hostname' (VS2101X-001576), 'S/N', and 'Mode' (ENCODER). The 'Network' tab shows fields for 'Multicast Group IP' (224.2.0.1), 'Multicast Group Port' (5000), 'MAC Address' (00:8C:10:00:15:76), 'IP Mode' (Static), 'IP Address' (192.168.1.51), 'Subnet Mask' (255.255.255.0), and 'Gateway' (192.168.1.254). Below these tabs is a 'Config' section with buttons for 'User Config', 'Firmware Update', 'Locate Device', 'Factory Default', 'System Reboot', 'Restore', 'Download', and 'Upgrade'. The version '1.29' is displayed at the bottom right.

FIGURE 3-2: ENCODER SYSTEM TAB



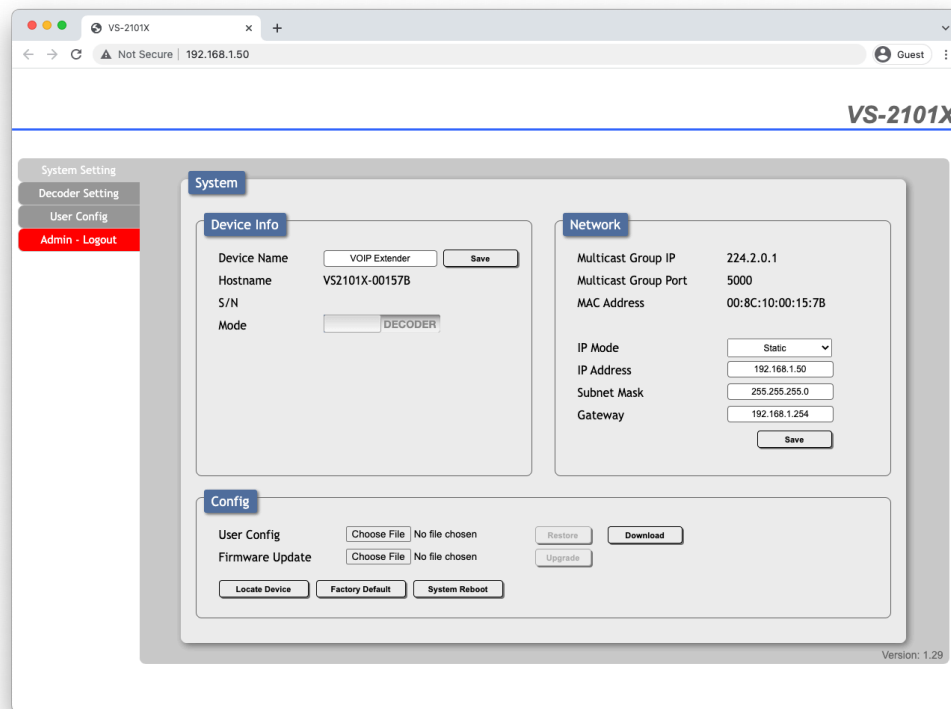


FIGURE 3-3: DECODER SYSTEM TAB

TABLE 3-1 SYSTEM TAB INFORMATION/OPTIONS

ITEM	DESCRIPTION
<b>Device Info</b>	Section that allows the user to rename the device for easy identification
<b>Network</b>	Section that describes the Multicast IP, Group Port, and MAC address.
IP Mode	Allows the user the set the network to either Static, DHCP, or Auto
<b>Config</b>	This section allows the user to download the XML Edit file and save it to a PC. The user can also restore the config by selecting the file from the Choose File option.
Locate Device	By Pressing this button, the Status Light on the front of the device will begin to flash. Press it a second time to exit flashing mode.
Factory Default	Restores the device to all factory Defaults
System Reboot	Allows the user to Reboot a device via the User Interface

## 3.3 EDID TAB

This tab provides the option of Internal EDIDs, one sink-sourced EDID, and customer-uploaded EDIDs that can be assigned to the HDMI input port. The names of the customer-uploaded EDIDs can be changed if desired. There are six standard EDIDs, one sink-sourced EDID, and four customer-uploaded EDIDs.

**NOTE:** The “EDID” tab is only available in encoder mode.

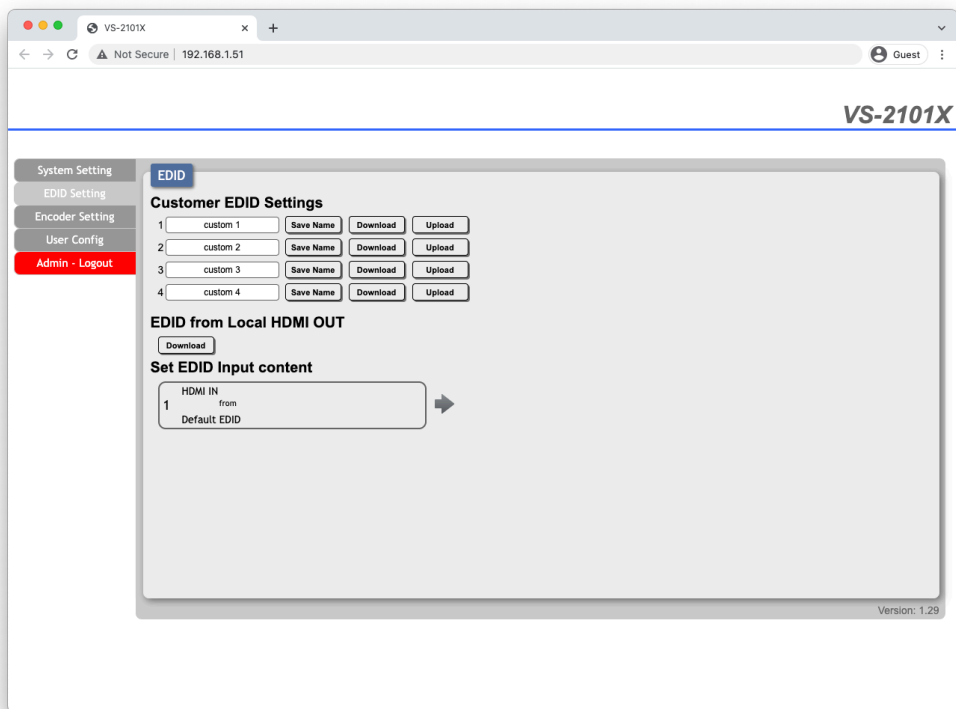


FIGURE 3-4: EDID TAB



## 3.4 ENCODER SETTING TAB

This tab provides options for encoder settings.

**NOTE:** The “Encoder Setting” tab is only available in encoder mode.

**TABLE 3-2 ENCODER SETTING TAB INFORMATION/OPTIONS**

ITEM	DESCRIPTION
<b>Mainstream</b>	Allows the user to define the encoder settings
Decode Mode	H.264 or H.265
Maximum Resolution	1080P
Maximum Frame Rate	1 to 60
GOP	Default 60
Rate Control Mode	VBR (Variable Bit Rate) or CBR (Constant Bit Rate)
<b>Substream</b>	
Decode Mode	H.264 or H.265
Maximum Bit Rate	Default 10000Kbps
Maximum Resolution	1080P, 720P, 480P
Maximum Frame Rate	1 to 60
GOP	Default 60
Rate Control Mode	VBR (Variable Bit Rate) or CBR (Constant Bit Rate)

# CHAPTER 3: OPERATION

## 3.5 DECODER SETTING TAB

This tab provides controls over the HDMI output mode, output resolution, and video source settings.

**NOTE:** The “Decoder Setting” tab is only available in decoder mode.

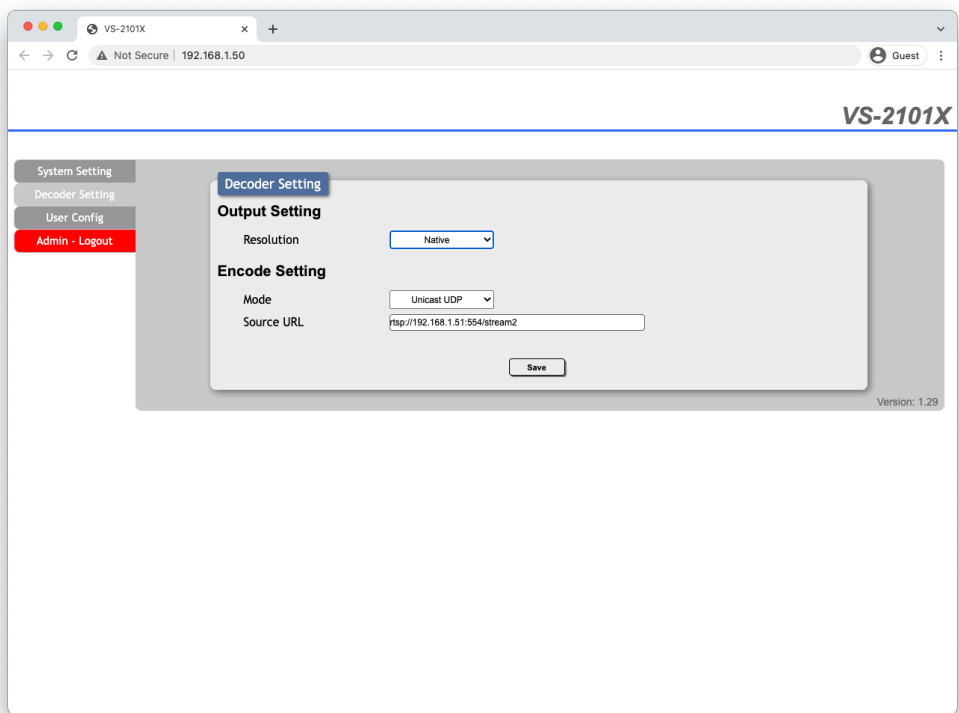


FIGURE 3-6: DECODER SETTINGS TAB

TABLE 3-3 DECODER SETTINGS TAB INFORMATION/OPTIONS

ITEM	DESCRIPTION
<b>Output Setting</b>	
Resolution	Native, 1920X1080P60, 1920X1080P50, or 1280X720P60
<b>Encode Setting</b>	
Mode	Unicast TCP, Unicast UDP, or Multicast
Source URL	This is the RTSP URI that can used to stream the encoded content. <b>EXAMPLE:</b> rtsp://192.168.1.51:554/stream2



## CHAPTER 3: OPERATION

### 3.6 USER CONFIGURATION TAB

This tab provides control over login authentication.

The screenshot displays a web browser window with the address bar showing "VS-2101X" and "192.168.1.51". The page title is "VS-2101X". On the left, a sidebar contains navigation links: "System Setting", "EDID Setting", "Encoder Setting", "User Config", and "Admin - Logout". The "User Config" link is highlighted in red. The main content area is titled "Web & Telnet Login Configuration" and contains the "Administrator" section. This section includes five input fields: "Old Username" (pre-filled with "admin"), "Old Password", "New Username" (pre-filled with "admin"), "New Password", and "Confirm New Password". A "Save" button is positioned to the right of the "New Password" field. The version number "Version: 1.29" is displayed in the bottom right corner of the configuration area.

FIGURE 3-7: ENCODER USER CONFIGURATION TAB

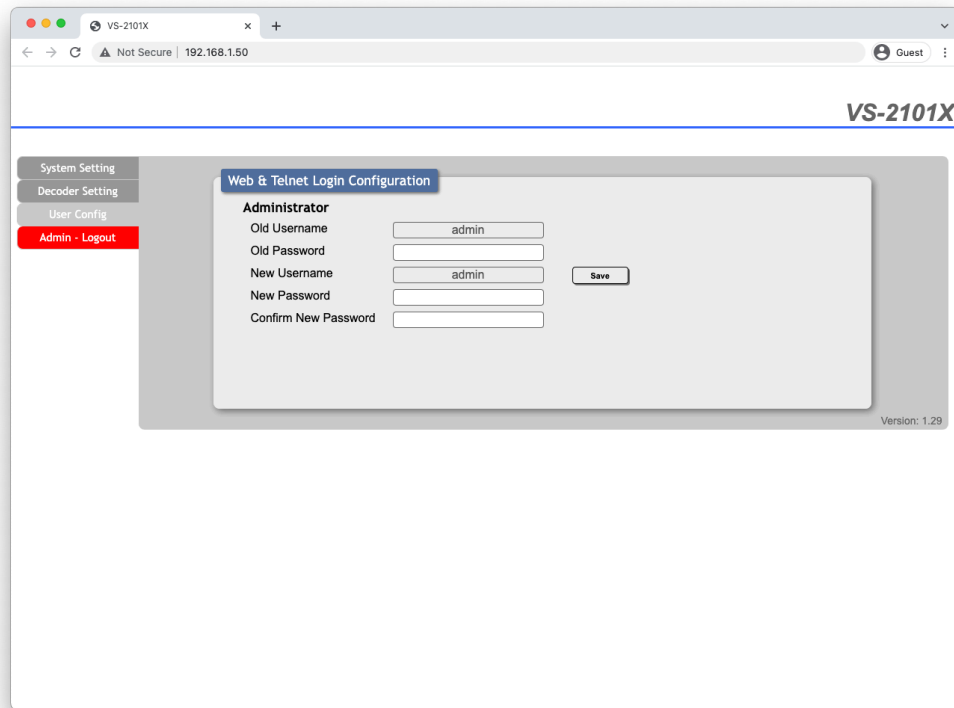


FIGURE 3-8: DECODER USER CONFIGURATION TAB

### 3.7 FIRMWARE UPDATES

Firmware updates are available through Web UI/USB update. For the latest Firmware package, please contact [techsupport@blackbox.com](mailto:techsupport@blackbox.com).

## APPENDIX A: REGULATORY INFORMATION

### A.1 FCC STATEMENT

This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Quick Installation Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his/her own expense.

### A.2 CE STATEMENT

This is a Class B product in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

### A.3 ROHS

This product is RoHS compliant.

## APPENDIX A: REGULATORY INFORMATION

### A.4 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 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 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 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.

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