

VSA-X21

HDMI Audio Extractor with 50 Watt Audio Amplifier, HDBT Input, Line Audio Input RS-232 Ports and IP Control (Telnet & Internal Web GUI)

CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S. 800-959-6439
FREE technical support, Call **714-641-6607** or fax **714-641-6698**
Address: **Hall Research**, 1163 Warner Ave. Tustin, CA 92780
Web site: www.hallresearch.com E-mail: info@hallresearch.com

1. VSA-X21 Windows™ Software Installation

1.1. General

The VSA-X21 is controllable via free Windows® based software available from the Hall Research website. All of the device features, and more, are accessible and controllable from the GUI.

1.2. Software Installation Prerequisites

- A PC with Windows XP® OS or later
- USB port
- Microsoft® .NET Framework 3.5 or later (most recent OS including Windows 8 and later include this software and no action is required). If the .NET Framework 3.5 or later is not installed on your PC, the Microsoft™ website has free downloads available.

1.3. Software Installation

If an earlier version of this particular software was previously installed, UNINSTALL the program first from either the Add/Remove Programs section of the control panel or by running the previous installation's SETUP.EXE and selecting "remove application".

- Install the software by executing the SETUP.EXE program from the installation source directory
- Accept the default settings, but if you want to specify a particular installation directory other than the default, you may do so.
- Once the VSA-X21 software installation has completed, either click the desktop icon or navigate the Start Menu to

Start -> Programs -> Hall Research -> VSA-X21 Amplifier

2. Using the Software

2.1. General

For most installations the use of the software GUI is not required as most functions can be performed using the front panel buttons on the product.

The software GUI allows the user to customize many of the VSA-X21 features to help with installation issues and usage.

You can use the software to import/export EDID files from the device. Custom EDID data can also be written to devices connected to the output if they support that function.

It is possible to connect more than one VSA-X21 to the PC (using several USB ports of the PC). The same software GUI detects all connected devices and allows control from the same application.

2.2. USB Device Detection

The VSA-X21 software uses standard Windows® drivers, which automatically configure the USB port after connection and do not require the installation of any special USB drivers.

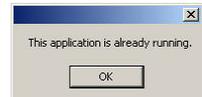
The first time you connect the VSA-X21 to the PC, you may experience a short delay and a windows notification pop-up message may be shown.

- 2.2.1. The software GUI scans the VSA-X21 settings continuously in real time, all device changes are immediately reflected on the software GUI.
- 2.2.2. If no VSA-X21 device is attached to the system, the on-screen fields are disabled (grayed out).



The new device detection and driver auto installation typically only occurs once. Thereafter, reconnected devices are detected with no delay or message.

- 2.2.3. Only one instance of the software GUI can run at a time. Attempting to execute the application more than once will result in a warning message.



2.3. Tool Bar Menu

2.3.1. EXIT



Exits the application

2.3.2. RESTORE



Restore previously saved configuration files

2.3.3. SAVE



Save the current configuration file.

2.3.4. TOOLS



Factory Defaults

Restore the device to factory default settings.
The user must confirm the action.



Import EDID

Import an EDID (256-byte binary or XML file) into the unit. (If the file has an XML extension, the file will be interpreted as containing XML data; otherwise, the file will be interpreted as containing BINARY data). Uploading invalid files will result in EDID corruption.

Export EDID

Save the current EDID as a 256-byte binary file

This file can be edited using third party software and reloaded using the 'Import EDID' tool selection.

Firmware Update

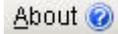
Allows users to field upgrade the device application firmware.

Only valid firmware files can upload into the VSA-X21.

LAN Update

Allows users to field upgrade the device application LAN firmware (WEBGUI).

2.3.5. ABOUT

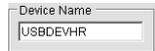


Displays screen with software versions, website link, legal disclaimer and copyright information. The Serial # information displayed is a time/date stamp referenced to GMT (Greenwich Mean Time) and has no reference to the serial number sticker on the actual device.



2.4. Device Name

Assigns a descriptive name to be given to the VSA-X21 device that is a maximum 8 characters long.

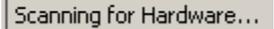


The user is not allowed to change the device name with multiple devices connected. The FACTORY DEFAULT name is **USBDEVHR**.

2.5. Status Bar

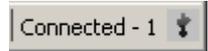
The bottom bar of the screen shows the current USB status as follows:

“Scanning for Hardware...”



The GUI software is looking for VSA-X21 devices.
Screen controls disable until a valid VSA-X21 device attached

“Connected – XX”



Where XX is the number of VSA-X21 devices connected to the PC.

2.6. Status Group

Power

The *Power* control shows the device power state as well as being able to control the ON or OFF state. Factory default is ON.



Video Input

No Video

Indicates the system is not receiving an INPUT video signal.

HDCP On

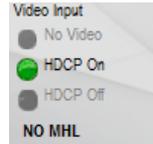
Indicates video received has HDCP Encryption enabled.

HDCP Off

Indicates video received has HDCP Encryption disabled.

NO MHL

Indicates the MHL status of the connected HDMI source.



Audio Input

No Audio

Indicates no audio received (DVI mode)

Multi-Channel

Indicates HDMI audio received is **not** LPCM format.

2 Chn

Indicates HDMI audio received is LPCM format.



Video Output

+5 ON/OFF

Indicates the state of the +5 vDC signal to the HDMI OUTPUT. When the HDMI INPUT +5 vDC is connected, the +5 vDC OUTPUT signal is turned on and this indicator will be green. When no +5 vDC signal is detected on the HDMI INPUT, the indicator on the screen changes to a dark red color.

Connected or Disconnected

Indicates the state of the device connected to the VSA-X21 HDMI OUTPUT.

When a HPD signal is detected, the button will be green and the word **Connected** will be shown next to it.

When no display is detected (or the display is not sending an HPD signal), then the indicator on the screen changes to a dark red color and the word **Disconnected** will be shown next to it.

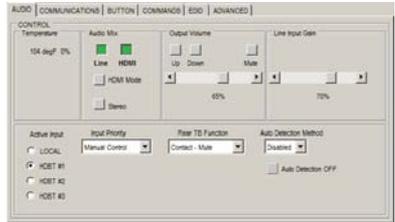


2.7. Audio Tab

Control

The current device temperature and fan percentage are displayed.

The Fan turns on @ 120 degF at 55% fan percentage. The fan reaches 100% at 160 degF.



Audio Mix

The Line control shows the device LINE Audio state as well as being able to control the ON or OFF state. Factory default is **ON**.

- When ON, the 3.5mm LINE IN audio is mixed and output on the amplifiers speakers and 3.5mm LINE OUT connectors.
- When OFF, the 3.5mm LINE IN audio is not mixed and not output.

The HDMI control shows the device HDMI Audio state as well as being able to control the ON or OFF state. Factory default is **ON**.

- When ON, the HDMI IN audio is mixed and output on the amplifiers speakers and 3.5mm LINE OUT connectors.
- When OFF, the HDMI IN audio is not mixed and not output.

The HDMI Mode control shows the device HDMI Mode state as well as being able to control the HDMI or ARC state. Factory default is **HDMI**.

- When OFF, the HDMI IN audio is mixed and output on the amplifiers speakers and 3.5mm LINE OUT connectors.
- When ON, the HDMI OUT ARC audio is mixed and output on the amplifiers speakers and 3.5mm LINE OUT connectors.
- The Stereo/Mono control shows the device Stereo/Mono audio state as well as being able to control the Stereo or Mono audio output state.

Output Volume

The Up control increases the volume by 1% for each click.

The Down control decreases the volume by 1% for each click.

The Mute control shows the device audio MUTE state as well as being able to control the MUTE state. Factory default is **OFF**.

- When ON, the speaker and 3.5mm LINE OUT audio is muted.
- When OFF, the speaker and 3.5mm LINE OUT audio is NOT muted.

The volume Slider control adjusts volume as the user changes the control. Factory default is **0%**.

Line Input Gain

The volume Slider control adjusts the gain of the 3.5mm LINE IN audio as the user changes the control. Factory default is **70%**.

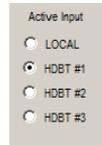
Active Input

The Active Input control shows the device current video input as well as being able to control the selected input.

'Local' is the Local HDMI IN on the rear panel.

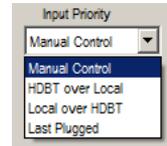
'HDBT #1', '#2' and '#3' refer to the video source connected to the HDBT IN connector.

When the UHBX-SW3-WP/S is used, each HDBT input refers to the corresponding input on the UHBX-SW3-WP/S.



Input Priority

The Input Priority control shows the device current setting as well as being able to control which video input (HDMI or HDBT) has priority or whether the 'Last Plugged' video source is to be selected.

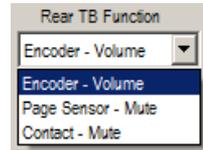


- **MANUAL CONTROL**
 - The video inputs have no priority.
 - The user can manually select which video input is active
- **HDBT over Local**
 - The HDBT video input has priority over the Local video input.
 - The **Active Input** controls disable in this mode.
 - When a video source is detected on the HDBT input, the device will automatically switch to that video input.
 - If the video source is removed, the device will automatically switch back to the Local HDMI input if that input has an active video source.
- **Local over HDBT**
 - The Local video input has priority over the HDBT video input.
 - The **Active Input** controls disable in this mode.
 - When a video source is detected on the Local input, the device will automatically switch to that video input.
 - If the video source is removed, the device will automatically switch back to the HDBT input if that input has an active video source.
- **Last Plugged**
 - The device switches to the video input that has an active source attached last.

Rear TB Functions

The *Rear TB Functions* control shows the device setup for the terminal strip functionality, where different controls or sensors may be connected.

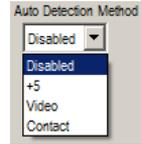
Factory default is **ENCODER**.



- **Encoder - Volume**
 - A compatible encoder connected on the rear terminal strip controls the device volume. (Compatible with Model UI-KNOB-DP)
- **Page Sensor - Mute**
 - A compatible page sensor connected on the rear terminal strip controls the MUTE function. (Compatible with Model VSA-PGSNS)
 - Whenever a signal is received of sufficient amplitude, the 3.5mm LINE IN and HDMI/ARC audio will be muted.
 - When the signal received is below the paging threshold, the 3.5mm LINE IN and HDMI/ARC audio will **NOT** be muted.
- **Contact - Mute**
 - When the **CW** and GND terminals are closed, the audio output will be muted.
 - When the **CW** and GND terminals are open, the audio output will **NOT** be muted.

Auto Detection Method

The *Auto Detection Method* control field shows the device current Auto Detection Method state as well as being able to control the Auto Detect Method state. Factory Default is **DISABLED**.



- **Disabled**
 - Auto Detection is disabled
 - The **Off Delay** control is disabled in this mode.
 - The **AUTO** button in the WEBGUI is hidden in this mode.
- **+5V**
 - When +5 vDC is present on the currently selected input (Local or HDBT), the ON string associated with the AUTO function will be processed.
 - When the +5 vDC is no longer present, the OFF string associated with AUTO will be processed after the programmed Off Delay time has elapsed.
 - The **Off Delay** control is enabled in this mode.
 - The **AUTO** button in the WEBGUI is visible in this mode.
- **Video**
 - The video source must actually send video in order to be detected.
 - When video is received on the currently selected Input (Local or HDBT), the ON string associated with the AUTO function will be processed.
 - When the video is no longer active, the RS-232 OFF string OFF string associated with AUTO will be processed after the programmed Off Delay time has elapsed.
 - The **Off Delay** control is enabled in this mode.
 - The **AUTO** button in the WEBGUI is visible in this mode.
- **Contact**
 - When terminals CCW and GND are closed, the ON string associated with AUTO will be processed.
 - When CCW and GND are open, the OFF string associated with AUTO will be processed.
 - The **Off Delay** control is disabled in this mode.
 - The **AUTO** button in the WEBGUI is visible in this mode.

Auto Detection

The Auto Detection Active/Inactive button shows the device current setting as well as being able to control whether an active source will be detected or not.

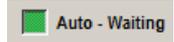
- **Auto Detection Off**

- No action is taken.
- Factory default is OFF.



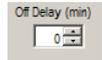
- **Auto – Triggered or Waiting**

- When the Auto Detection Method control is **NOT *disabled***, the device will process the RS232 ON and OFF strings associated with the AUTO function whenever a specified event (+5 or Video) occurs.
- **Waiting** signifies that the device is still waiting for the specified event to occur.
- **Triggered** signifies that the device has detected the specified event.



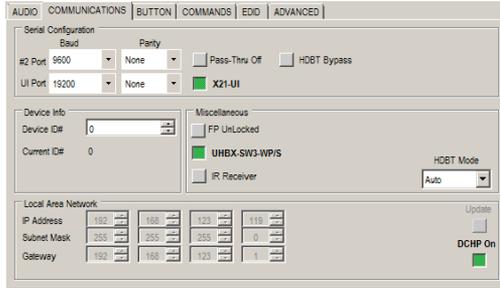
Off Delay (min)

The Off Delay (min) control field shows the device current off delay value as well as being able to set that value. Factory Default is 3 minutes.



- The control is disabled if the Auto Detection Method is set to **Disabled** or **Contact**.
- When set to 0 minutes and 'Auto Detection Method' is set for '+5' or '**Video**' the RS232 OFF string associated with the AUTO Function will be processed immediately.
- When set to any value between 1 and 240 minutes, the RS232 OFF string associated with the AUTO Function will be processed after the programmed delay has elapsed.

2.8. Communications Tab



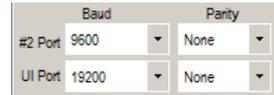
Serial Configuration

Baud

The Baud controls show the device baud rate setting for the available serial ports.

Factory default is 9600 for Serial Port #2

Factory default is 19200 for the X21-UI serial port (when installed)



Parity

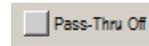
The Parity controls show the device parity setting for the available serial ports.

Factory default is NONE for Serial Port #2

Factory default is NONE for the X21-UI serial port (when installed)

Pass-Thru

The Pass-Thru control shows the device RS232 Pass-Thru state as well as being able to control the ON or OFF state. Factory default is OFF.



The available serial ports can be either the Serial Port #1 on rear of device, the X21-UI serial port (when installed) or the HDBT TX serial port (when available).

- When ON, RS232 characters received from any of the serial ports are 'Passed thru' to Serial port #2 unchanged.
- When OFF, RS232 characters received on any of the serial ports are NOT 'Passed thru' to Serial port #2.

HDBT Bypass

The HDBT Bypass control shows the device current HDBT Bypass state as well as being able to control the ON or OFF state.

Factory default is **OFF**.

When enabled, any characters received on the HDBT IN will be bypassed directly to Serial port #2.

NOTE:

The 'Baud' and 'Parity' controls do not apply when this control is enabled.

The baud rate used is whatever the HDBT TX device used.

The HDBT RS232 stream will **NOT** be able to control the VSA-X21 in this mode.

**X21-UI**

The X21-UI control setting shows the device current setting as well as being able to control the ON and OFF states.

Factory default is **ON**

- When OFF, no special processing is done.
- When ON, the device will send to and receive commands from the installed X21-UI for control.

**Device Info****Device ID#**

The Device ID# control shows the device ID#.

Factory default is 0.

Device ID#	<input type="text" value="0"/>
Current ID#	<input type="text" value="0"/>

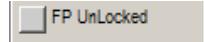
Current ID #

The Current ID# control shows the device ID#. Factory default is 0.

Miscellaneous

FP Unlocked/Locked

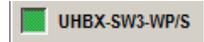
The *FP Unlocked/Locked* control shows the device front panel lock status. Factory default is Unlocked.



- When UNLOCKED, the device front panel buttons are active.
- When LOCKED, the device front panel buttons are NOT active. RS232, webpage and telnet commands are always active even when the FP is in the LOCKED state.

UHBX-SW3-WP/S

The *UHBX-SW3-WP/S* control setting shows the device current setting as well as being able to control the ON and OFF states.

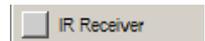


Factory default is ON

- When OFF, no special processing of the HDBT RS232 is done.
- When ON, the device will send and receive RS232 commands to/from the installed UHBX-SW3-WP/S for control.

IR Sender/Receiver

The *IR Sender/Receiver* control shows the device current setting as well as being able to control the IR Receiver or IR Sender States.



Factory default is IR Receiver

- When set to **IR Receiver**, ANY IR Signals sensed are sent to the HDBT TX for IR output. (compatible with Model CIR-DET-P2)
- When set to **IR Sender**, ANY IR Signals received from the HDBT TX device **OR** the UHBX-SW3-WP/S (if installed) **OR** the X21-UI (if installed) is transmitted from the 3.5mm IR output on the device rear panel. (Compatible with Model CIR-EMT or CIR-KIT-EMT2)

Local Area Network

IP Address

The IP Address control shows the device IP address.

Factory default is **DHCP** so the end users compatible DHCP router determines this address.

IP Address	192	168	123	119
Subnet Mask	255	255	255	0
Gateway	192	168	123	1

Subnet Mask

The Subnet Mask control shows the device subnet mask.

Factory default is **DHCP** so the end users compatible DHCP router determines this subnet mask.

Gateway Address

The Gateway Address control shows the device Gateway address.

Factory default is **DHCP** so the end users compatible DHCP router determines this address.

DHCP

The DHCP control shows the device DHCP status.

Factory default is **ON**.

DHCP On	<input checked="" type="checkbox"/>
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- When **OFF**, the IP address, Subnet Mask and Gateway address are determined by the settings in the other fields (after the UPDATE button is clicked).
- When **ON**, the IP address, Subnet Mask and Gateway address are determined by the end users compatible DHCP router.

UPDATE

The UPDATE control is enabled only when DHCP is **OFF** and a setting has been changed.

Click this control after setting the IP address, Subnet Mask and Gateway address to the desired **STATIC** settings.

Update	<input type="button" value="Update"/>
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2.9. Buttons Tab

These controls configure the eight programmable buttons that appear in the WEBGUI and on the X21-UI

Name

The name for the button that will appear on the WEBGUI button.

Function

The VSA-X21 system function associated with the button. When pressed, buttons will execute the assigned function.

Type

The button type can be set for Momentary or Toggle action. Toggle buttons have two RS-232 strings associated with them. Momentary buttons have one RS-232 string associated with them.

Group

The button group assigned to this button. Multiple buttons can be assigned to the same group #. Only one button in the group can be active at one time.

Enable?

Whether the button is enabled or not. Buttons that are not enabled do not respond and the button is removed from the WEBGUI.



INSERT

The INSERT control appends a new command. If the new command exceeds the maximum length allowed, a window will be displayed. (32 characters maximum). Each Function uses a different number of characters over and above any fixed characters that are required.



CLEAR

The CLEAR control is clicked to erase the entire pre-programmed command sequence.

UPDATE

The Update control is clicked to save the existing programmed command. This control is only visible when an unsaved change has been made to the configuration.

EXAMPLE CONFIGURATION

To send the RS232 string "PWR ON" followed by a Carriage Return character out Serial Port #2 and then wait 5 seconds.

Select the desired Button Action for this command. (i.e... Which button should be used to send this command?)

Select Serial from the Function control.

Enter the characters PWR ON^{CR} into the 'COMMAND' field and click 'INSERT'.

Select Delay from the Function control.

Set the Delay (sec) to 5 and click 'INSERT'.

Click 'UPDATE' to save the command.

2.11. Programming the VSA-X21

- RS-232 baud rate, parity and control information for the SINK device may be required.
 - Gather the information from the manufacture of the SINK device.
- Configure for optional equipment installed
 - UHBX-SW3-WP/S (Communications Tab)
 - UI-KNOB-DP (Communications Tab)
 - VSA-PGSNS (Communications and Advanced Tabs)
 - X21-UI (Communications and Button Tabs)
 - By default, all buttons are disabled, but have no Function or RS-232 strings assigned so they will only turn on the LED on and off on the X21-UI and/or WEB GUI.
- Learning the SINK EDID and having it stored in the VSA-X21 can reduce EDID colorspace and audio issues.
 - Set VSA-X21 to EMULATE the EDID.
 - If UHBX-SW3-WP/S is also used, set its GUI EDID for 'Pass-Thru'.

2.12. EDID Tab

VIDEO EDID

Clicking these controls selects to either PASS-THRU or EMULATE the EDID.

PASS-THRU uses the SINK EDID while EMULATE uses the internal EDID saved in the VSA-X21.

PASS-THRU is the FACTORY DEFAULT setting.



Learn EDID

Clicking this control will extract the EDID from device connected to the output connector and save it in the unit. The user must confirm the action.



EDID Data Display

The data shown in the EDID table is continually scanned to ensure that the checksums for each block is valid.

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	22	48	50	02	09	00	00	00
01	00	16	03	03	00	00	14	04	14	01	42	54	42	00	28	
02	0F	50	54	3F	CF	00	83	C0	38	30	40	38	00	A8	40	
03	80	00	01	C0	01	00	24	10	00	00	00	00	00	00	00	
04	7E	00	00	00	00	00	1E	80	00	00	00	00	00	00	00	
05	48	00	36	00	00	00	00	00	00	00	00	00	00	00	00	
06	20	48	70	A8	70	00	00	00	00	00	00	14	20	20	80	
07	82	1A	27	40	88	80	38	00	00	00	00	00	00	1A	07	
08	02	03	20	F2	48	96	82	04	00	10	10	00	7F	07	58	
09	07	50	2E	06	C0	83	1F	00	00	88	03	00	00	00	00	
0A	20	40	00	2C	45	00	00	00	00	00	00	10	1A	00	80	
0B	00	00	00	1E	01	10	00	72	81	00	10	20	8A	20	00	
0C	00	00	00	1E	01	10	00	85	20	00	10	20	00	00	00	
0D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0E	55	4E	00	00	00	00	00	1E	00	00	00	00	00	00	00	
0F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	

When wrong checksums are detected, the invalid checksum byte is highlighted in RED.

If an action is performed that affects the EDID such as initiating a "learn" process, The checksum field might momentarily flash 'RED' during the this process, but should go back to normal once the entire table is updated.

NOTE

You cannot "LEARN" an EDID that has an invalid checksum. If you try to learn an EDID that has a checksum error, the HDMI and MUTE Button LEDs on the unit will alternately flash 5 times to indicate the error.

No other checks are performed on the EDID to determine that it is valid per the EDID standard. However, the GUI software can import and upload to the VSA-X21, EDID's that contain invalid checksum for testing purposes.

2.13. Advanced Tab

Ducking & AutoMute

AutoMute Threshold

The AutoMute Threshold control shows the device current setting and allows the setting to be adjusted between 0 and 100%. Factory default is 0%. (Technically, this is 'OFF' since the audio level cannot go below 0%)



When the 3.5mm LINE IN audio level is **below** the AutoMute Threshold value, the LINE IN audio will be muted after the AutoMute Delay time has elapsed.

The LINE IN audio will be immediately un-muted with audio level is **above** the AutoMute Threshold value.

Ducking Threshold

The Ducking Threshold control shows the device current setting and allows the setting to be adjusted between 0 and 100%. Factory default is 100%. (Technically, this is 'OFF' since 100% cannot be exceeded)

If the 3.5mm LINE IN audio level exceeds this amount, the HDMI/ARC volume will be reduced by the given 'Ratio'.

Ratio

The Ratio control shows the device Ducking Threshold ratio. This is the percentage the HDMI/ARC volume is reduced when the Ducking Threshold is exceeded. Factory Default is 50% (ie... cut the HDMI volume in half)

Example

When the Ducking Threshold is exceeded, whatever volume level the HDMI/ARC is currently set for will be reduced by the 'Ratio'.

*If the volume level is currently set to 75% and the 'Ratio' is set for 50%, when the Ducking is in effect, the output volume level will be set for $75\% * 50\% = 37.5\%$.*

PageSense

Threshold

The Threshold control shows the device Paging Sensor voltage threshold. Factory default is 100%. (Technically, this is 'OFF' since 100% cannot be exceeded)

If the Paging Sensor input voltage exceeds this amount, the audio output will be muted.

When the input voltage goes below this amount, the audio output will be un-muted.

Overcurrent

Threshold

The Threshold control shows the device Overcurrent voltage threshold. Factory default is ~30%.



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