



Hall Research Technologies, Inc.

Model V5A-31

A / V Switch-Cat™

All-in-One A/V Distribution System

Switching, UTP Transmission, Serial Control, and Audio Amplification



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UMA1114 Rev n/c

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FCC and European Union Declaration of Conformity

This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It complies with the limits for a Class A computing device, pursuant to Part 15 of the FCC rules.

This product complies with the requirements of the European EMC directive 89/336/EEC



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1.0 General

Thank you for purchasing Hall Research Technologies' VSA-31 A/V switching control system. The package is comprised of a 3 input A/V switcher on a 4-gang wallplate (transmitter) plus a remote receiver with video, audio, and serial control outputs, a serial programming cable as well as a Windows™ Software disk are also included in the package.

This device is used to add audio video capability to any room. The installer need only supply the display device (such as a projector) and passive 4 or 8 ohm speakers.

The unit accommodates the following inputs:

- Input #1: PC (VGA to UXGA) or Component (YPbPr) with Stereo Audio
- Input #2: PC (VGA to UXGA) or Component (YPbPr) with Stereo Audio
- Input #3: S-Video or Composite Video with Stereo Audio

The VSA-31 provides individual buttons for turning the projector on/off and selecting the video source for display. It sends the selected AV to a remote receiver unit via 2 Cat5 Cables. No power supply is needed for the wallplate. The remote unit can be up to 750 ft away and has a built-in 12 Watt Stereo Amp which can drive a pair of 4 or 8 ohm speakers directly. A line output is provided for connection to an external amp if necessary. A Volume knob on the wallplate allows adjustment of the sound level. The VSA-31 automatically controls projector operation (on/off and source selection) via serial commands stored in the unit by just the touch of a button.

2.0 Features

- ✓ Accepts 2 VGA and 1 TV-Video (Composite or S-Video) each with its own stereo audio
- ✓ Provides individual buttons for turning the projector on/off and selecting the video source for display
- ✓ Sends selected AV to a remote receiver unit via 2 Cat5 Cables
- ✓ No power supply is needed for the wallplate
- ✓ Remote unit can be up to 750 ft away and automatically perfects the video
- ✓ Built-in 12 Watt Stereo Amp drives a pair of 4 or 8 ohm speakers directly
- ✓ Volume knob on the wallplate allows adjustment of the sound level
- ✓ Automatically controls projector operation (on/off and source selection) via serial commands stored in the unit
- ✓ Comes with Windows™ GUI software and cable for programming

3.0 Installation

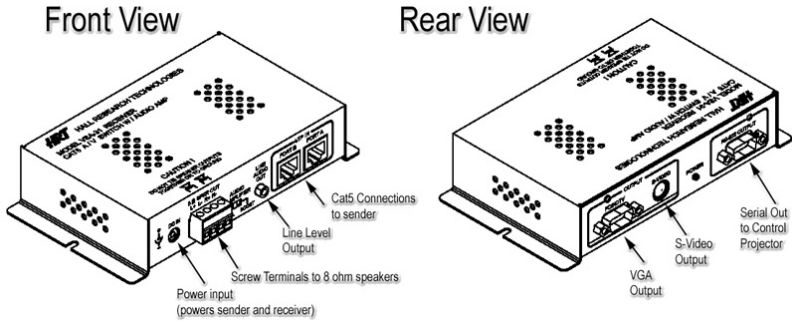
In a typical installation, the Sender unit is located on a wall or panel and is wired to the remote Receiver unit via 2 Cat5 cables.

The sender qualifies as a low-voltage class 2 device and does not require a J-box. In fact it does not even need a power supply to be connected to it, as it draws power via the signal connection to the remote unit. However, in most instances it is easier to use a standard 4-gang electrical box in order to attach the faceplate to the mounting surface or structure.

Please contact HRT or your desired electrical supply house for purchasing the J-box. These are generally inexpensive units.



Model VSA-31



As seen in the above diagrams, the connection between the receiver and the projector are comprised of VGA, S-Video, and RS232. These cables are not supplied and must be purchased separately.

Please note that most projectors use a unique and non-standard Serial input connector, therefore you need to build your cable according to the pin out provided by the projector manufacturer or purchase a cable from them.

If you will be making your own cable, the VSA-31 receiver has the following RS-232 pinout:

Connector on VSA-31: DB9-Male
Transmit: Pin 3
Receive: Pin 2
Ground: Pin 5

Note on video signals that go to the Projector

When you select either of the 2 VGA inputs, the VGA output to the projector has the selected signal and the S-Video output is blanked out. Conversely, if the input is Composite Video or S-Video, only the S-Video output to the projector will have a signal. This means that it is possible to use the projector's auto-detect mode to switch between video inputs and not even connect the serial port to the projector. However in doing so, you will not be able to use the on/off button on the sender to control the projector, and you will still have to rely on the projector's remote to turn it on and off.

Prior to final installation of the wallplate, you need to use the supplied Windows™ software and the serial cable to program the serial codes needed to operate the projector into the sender wallplate.

Note on CV and S-Video Inputs

Do not connect the Composite Video and S-Video inputs simultaneously. Doing so will produce a poor quality image

Note on RS-232 port availability on your PC

Most PCs and notebooks do not have a serial port. So to program the sender you may need a USB to RS-232 Serial converter. These are available from Hall Research Technologies (Model USB-RS232-1).



Note on Uploading Serial Codes

For your convenience the wallplate sender has a power connector. In the final installation this connector will be left open. However, you can use the power supply that is included with the unit to solely power up the Sender (with no RJ45 connections) in order to upload the serial codes. Of course, when the RJ45's are connected, with the power supply at the receiver, you can still upload the serial codes as well.

For more on the topic of Serial Control of the projector please refer to sections 5.0

4.0 Operation

The user's operation of the system is almost self-explanatory. There are 4 buttons on the wall plate for powering the projector and selecting one of the 3 A/V inputs.

The buttons are back-lit so you can tell which input is selected or if the projector is turned on or not. If the command string has a wait, during the prescribed wait time, the LED will be blinking and the user cannot switch channels.

There is a volume knob on the sender with a corresponding LED bar to indicate the current loudness setting.

The VSA-31 remembers the settings independently for each input. So as you switch between inputs, the volume setting recalls the last setting of that input.

Notes on Audio Output

The receiver has an "Audio Amplifier" switch with "Normal" and "Boost" settings. For a small room use the "Normal" setting, for larger rooms use the "Boost" setting. This is used to normalize the loudness LED bar display, so in a small room where you never would set the sound volume too loud, with the "Normal" setting the LED bar display is not all the way to the bottom all the time! Also note that if you use 4 Ohm speakers, the power output from the system is maximized, so if you are using 8 Ohm speakers, and in "Boost" you still don't have sufficient loudness, then you better switch to a lower impedance speaker such as 6 or 4 Ohm.

You can add more than one speaker to each of the Left or Right output of the unit. If you are using 8 or 16 Ohm speakers, you can parallel 2 of them on each channel (for a total of 4 speakers). If you are using 4 Ohm speakers, then you need to put 2 of them in series for each channel (for a total of 4 speakers).

The VSA-31 receiver has a Line-level audio output. This connector is used in cases where the built-in power amp may not be sufficient. Upon connecting a plug to this jack, the power amp outputs are disabled and you can route a stereo cable to any external Audio Amp of your choosing. The volume knob on the sender still acts on the level of the line output signal.

5.0 Windows™ Projector Configuration Software

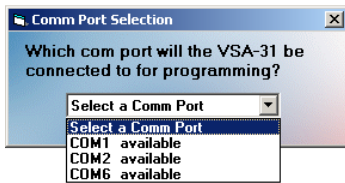
Included in the VSA-31 package is a CD with the application that you need to use to select your projector model in order to upload the configuration serial parameters. This is a one time task, as long as you do not change your projector. You can also create your own command string set as explained below.

. Installing the Software

To install the software, load the CD into your PC and double-click on the setup.exe file on the CD. The installation wizard will walk you through the rest of the installation

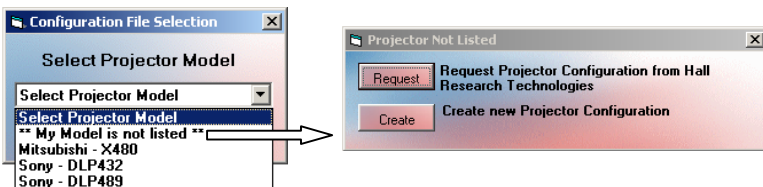
. Selecting the Com Port

The VSA-31 Programming Software will detect your available COM ports. Just select the COM port you will use to connect the VSA-31 to your PC



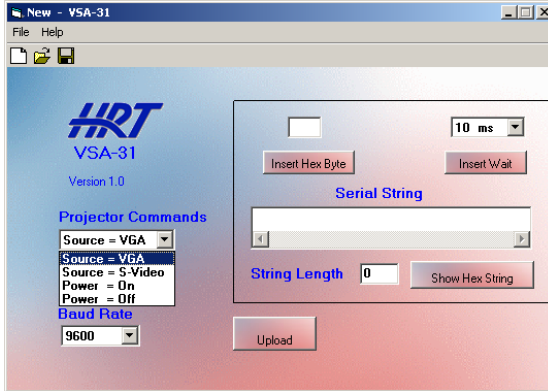
. Selecting your Projector Configuration file

Select your projector model from the drop down list. If your projector model is not listed, contact Hall Research Technologies via the Request button for your projector configuration file. You may also enter the projector codes in a new configuration file if you would prefer.



. Creating the Serial Strings

The serial string to the projector can be comprised of ASCII characters, hexadecimal bytes, and wait times embedded in the strings. The length of each serial string must not exceed 250 characters. The current length of each string will be displayed in the String Length box. You will notice in the Projector Commands drop down menu there are only 4 options. Select the Projector command you wish to edit and then start typing the serial string into the Serial String text box.



1. Source = VGA

This command will be issued when either one of the 2 VGA inputs is selected via the VSA-31's front panel buttons. This command will tell the projector to select the VGA input.

2. Source = S-Video

The Source = S-Video command will be issued when the 3rd input is selected. You will notice that the 3rd input can accept either Composite Video or S-Video. The VSA-31 up-scales the Composite video into S-Video so the projector is always receiving S-Video when input 3 is selected. The serial command associated with this command will tell the projector to select the S-Video input.

3. Power = On

This command will be issued when the Power button is pressed and the Power button LED is off. This command will instruct the projector to power on.

Note: We recommend inserting a 15-45 second wait after the power on serial command to allow the projector to completely power up before sending it more serial commands. (Time to wait will vary by projector)

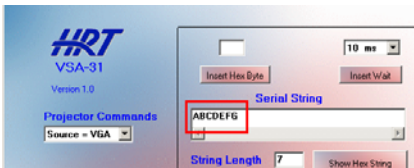
4. Power = Off

This command will be issued when the Power button is pressed and the Power button LED is on. This command will instruct the projector to power off.

Note: We recommend inserting a 45-90 second wait to allow the projector to completely power off before sending it more serial commands. (Time to wait will vary by projector)

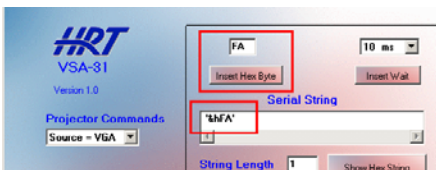
. Entering ASCII characters into the serial strings

Just start typing in either Serial Output text box to enter ASCII characters. You will see the characters as you type. You cannot paste or copy text and you cannot delete more than 1 character at a time. In the below example I typed uppercase ABCDEFG



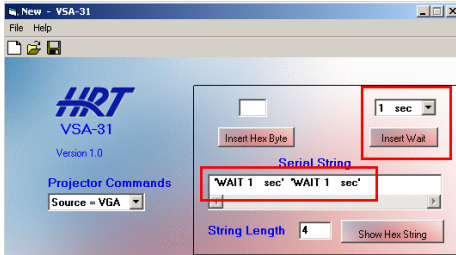
. Entering hexadecimal bytes into the serial strings

Enter Hexadecimal bytes by typing the hexadecimal byte into the box above the 'Insert Hex Byte' button. Then click 'Insert Hex Byte' button. The Hexadecimal byte will be inserted at the end of the current string. In this example I inserted the Hex byte FA



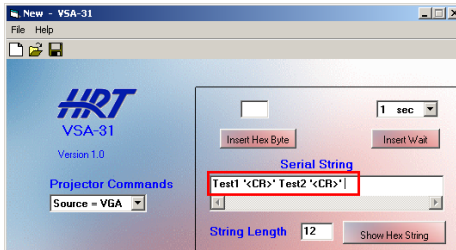
. Entering wait times into the serial strings

Waits can be entered into the serial strings by choosing the wait duration from the drop down menu then clicking 'Insert Wait' button. Each wait uses the space of 2 ASCII characters in the overall string length. In this example I inserted (2) 1-second waits for a total of a 2 second wait. When a wait time is being executed by the VSA-31 you will see the button that triggered that command blinking. During this wait period the VSA-31 will not accept user input from selection buttons.



. Entering Carriage Returns into the serial strings

To enter a Carriage Return <CR> into the serial string, just press the 'Enter' key on your keyboard. In this example I typed Test1 then I pressed Enter then I typed Test2 then I pressed Enter again



. Selecting the Baud Rate

Select the Baud Rate the VSA-31 needs to use to communicate with the projector from the drop down menu. Use a rate to match you projector's. Choices are: 1200, 2400, 4800, 9600, 19200, or 57600 bits per second.

. Setup to Program VSA-31

1. Install the VSA-31 Programmer software on the PC.
2. Connect power to the VSA-31.

3. Connect the VSA-31 to the PC via the supplied DB9-to-3.5 cable
4. Startup the VSA-31 Programmer software. (Located in Start menu)
5. Create the serial command strings
6. Save file and Upload

. **Loading or Saving Configurations**

You can save or load a configuration file by clicking on the File menu or choosing the appropriate icon. You can also create a new configuration file from the File menu or the New File icon

. **Uploading to the VSA-31**

To upload to the VSA-31, make sure the VSA-31 is connected to the PC, via the supplied DB9-to-mini-stereo programming cable, and is powered on then simply click on the Upload button

. **Putting the VSA-31 into Operation**

After you have successfully uploaded a configuration to the VSA-31 Transmitter, disconnect the VSA-31 Transmitter from the computer and power it off. Connect the VSA-31 Transmitter to the Receiver via the 2 UTP (Cat5/5e/6) cables. When you connect power to the Receiver, you will see the volume LED bar scroll from bottom to top several times to indicate the boot up sequence. The VSA-31 is now ready select video inputs and adjust the volume.

. **Operating the VSA-31**

The volume level indicator will have every other LED turned on when the VSA-31 is powered off. To operate the VSA-31, first press the power button. The power button on the VSA-31 will now light up. If you have uploaded a serial command for the “Power = On” command then that serial command will now be issued to the projector. Next, select an input 1-3 by pressing the corresponding button. The button you just pressed will light up and the serial command associated with that button will be sent to the projector. In addition to issuing serial commands to the projector the VSA-31 Transmitter will also switch the source of the video being transmitted to the Receiver to the input you just selected. Only 1 video source will be transmitted to the VSA-31 at any given time. Adjust the volume by turning the volume knob. You will see the volume level indicated by the volume LED bar. Volume level is adjusted per input and saved in memory for each input.

. Resetting the VSA-31

If for any reason you need to reset the VSA-31, press buttons 1 and 3 simultaneously and the unit will reset. This will not result in the loss of any serial command programming this will only reboot the unit. All the serial commands are still stored in the unit. You will need to press the power on button and reselect the input you wish to display.

6.0 Troubleshooting

Make sure that all your connections are solid, and check the state of the LED's on the front of the unit. Do not open or try to repair the unit yourself. There is no customer repairable items in the unit and you will void your warranty.

Contact HRT Support at 714-641-6607 or via email or web. If you need to ship your converter for repair, make sure to get a Return Material Authorization (RMA) number first.

7.0 Specifications

Resolutions	PC resolutions up to 1600x1200 @ 60 Hz & HDTV to 1080i, NTSC, PAL, or SECAM S-Video and CV
Video Level	Unity Gain. 1V p-p for Y, 0.3 V p-p for C
Audio Level	Variable Gain. 0 to +4dBu (0.78 to 1.23Vrms) line level with Amplified outputs L + R at 6 Watts per Channel
Temperature	Operating: 32 to 122°F (0 to 50°C); Storage: -40 to +185°F (-40 to +85°C)
Enclosure	Steel Receiver, Aluminum Sender
MTBF	90,000 hours (calculated estimate)
Power	12V DC from supplied universal power supply.
Size (wxdxh)	Sender: 4.5" High x 8.2" Wide x 1.4" Deep Receiver: 1.4" High x 3.6" Wide x 6.5" Long
Weight	2.1 pounds



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