



Hall Research Technologies, Inc.

## Model VS-4A

4 Channel VGA Switch with Audio & Serial Control



- Switches Between 4 PC Video and Audio Signals
- Manual or Auto Switching Based on Active Video
- RS-232 Serial Control

UMA1120  
Rev 1.1

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1163 Warner Ave Tustin, CA 92780, Ph: (714)641-6607 , Fax -6698



**Contents**

**1. INTRODUCTION..... 2**

    1.1 GENERAL ..... 2

    1.2 FEATURES ..... 2

**2. INSTALLATION..... 3**

    2.1 REQUIRED CABLES..... 3

    2.2 INPUTS & OUTPUTS..... 3

    2.3 CONNECTING THE VS-4A..... 3

    2.4 CONNECTION DIAGRAM..... 4

**3. CONFIGURATION & OPERATION ..... 5**

    3.1 MODES OF OPERATION..... 5

    3.2 FRONT-PANEL SWITCHES..... 6

    3.3 RS-232 CONTROL ..... 7

    3.4 SERIAL PORT CONTROL CODES..... 8

**4. TROUBLESHOOTING ..... 11**

    4.1 IN CASE OF TROUBLE ..... 11

    4.2 CALLING HALL RESEARCH TECHNOLOGIES ..... 11

    4.3 SHIPPING AND PACKAGING..... 11

**5. SPECIFICATIONS..... 12**

# 1. Introduction

## 1.1 General

Thank you for purchasing Hall Research Technologies VS-4A 4x1 VGA Switch with Audio & Serial Control.

This unit provides a video along with audio output that can be switched between four video and audio sources. The unit is housed in a small RFI shielded enclosure and is supplied with a universal AC power adapter.

The VS-4A unit provides all the A/V and control connections on the rear panel; the front panel has push-button switches with corresponding LED indicators for the selection of the video source. This unit can be controlled either manually using the front panel switches, automatically based on video detection, or remotely through an RS232 serial port.

The unit can be configured to operate in three different modes, which are: Auto, Scan and Normal. There is a priority selection that can be used to set for the video inputs. The switched output can be blanked and un-blanked from the PC command sent through the serial port. The front-panel buttons can be 'locked' to prevent accidental changes to the settings from a PC command sent through the serial port.

The unit also has EEPROM (internal non-volatile flash memory) to restore the last operating mode from when the unit is powered off.

## 1.2 Features

- ✓ Allows four video & stereo audio input sources to be switched to one output
- ✓ Can be manually controlled by push-button, via RS232 communication port or by detecting active video input
- ✓ Auto mode automatically scans and selects the input with active video with selectable input priorities
- ✓ Front panel buttons can be 'Locked' out
- ✓ Switched output can be blanked and un-blanked
- ✓ Stores the last selection and mode in EEPROM
- ✓ In scanning mode inputs are shown for pre-determined periods
- ✓ Ships with power supply
- ✓ Compact, Rugged, Reliable, and Economical and Made in USA

## 2. Installation

### 2.1 Required Cables

The video input cables are generally HD15 (VGA) male to male (customer furnished). The Audio inputs are 3.5 mm mini-stereo plugs (customer furnished). If you are going to connect the unit to a Serial port (such as PC's COM) you would need a straight-through Male/Female DB9 Serial Cable (customer furnished).

### 2.2 Inputs & Outputs

The VS-4A has 4 video and audio inputs marked Video 1 through 4 and Audio 1 through 4. The unit has 1 video and audio output marked Video and Audio Output. The unit has 1 serial port connector labeled RS232.

### 2.3 Connecting the VS-4A

Connect your video and audio sources such as computer or notebook PC to any of the Video and Audio Inputs 1 through 4.

Connect the display device such as a monitor (or a video projector) to the switched video and audio outputs (Video and Audio Output).

Connect the included power supply to the VS-4A.

Select the desired video source or mode of operation for your video and audio output using the front panel switched buttons. If preferred, the selection can also be done through RS-232 serial commands by connecting a DB9 RS-232 Serial cable to your PC and the VS-4A.

# 4 Channel VGA Switch w/Audio & Serial Control



VS-4A Front Panel



VS-4A Rear Panel

## 2.4 Connection Diagram



## 3. Configuration & Operation

### 3.1 Modes of Operation

**Auto Mode** - This will select the VGA and Audio input with the highest priority that has an active VGA signal.

**Scan Mode** - Will select each active VGA and Audio input signal for a specified number of seconds, 1-60, and then switch to the next active VGA input. The VS-4A can also be configured to scan the non-active VGA inputs as well as the active VGA inputs.

**Normal Mode** - VGA inputs are selected based on front panel push-button selections.

The VS-4A can only be in one of these modes at a time. You can specify mode of operation either from the Serial port or from the front panel (by pressing switch combinations simultaneously).

Pressing SEL 1 & SEL 2 simultaneously selects "AUTO" mode.

Pressing SEL 3 & SEL 4 simultaneously selects "SCAN" mode.

The VS-4A retains the last mode that it was in after power off and upon power up, will enter the last mode that it was in.

### 3.2 Front-Panel Switches

The front panel switches may be locked out so pressing them has no effect. Locking and unlocking the front panel switches can only be accomplished via the serial RS-232 commands.

The first function of the front panel buttons is to switch from one VGA & Audio signal to another. Just press the button and the VGA signal you selected will be displayed when the front panel is not locked. If there is no VGA signal to be displayed then you will see a black screen. The VS-4A will enter the Normal Mode any time a single front panel button is pressed and the front panel is not locked.

The second use of the front panel buttons is to put the VS-4A into Auto Mode. Press buttons 1 and 2 simultaneously and the VS-4A will enter the Auto Mode when the front panel is not locked.

The third use of the front panel buttons is to put the VS-4A into Scan Mode. Press buttons 3 and 4 simultaneously and the VS-4A will enter the Scan Mode when the front panel is not locked.

The time interval between switching will be the time interval last specified via the serial port. If no interval has been specified via the RS232 port then the default is 5 seconds.

Whether or not to scan non-active VGA inputs along with active VGA inputs will be determined from the last user input via serial port. If there has been no user input, the default is to not scan the non-active VGA inputs.



### 3.3 RS-232 Control

The VS-4A can also be controlled via a serial device. The unit operates at a baud rate of 4800 bps. From the serial port, you have full control over the operation of the switched output; mode, priorities, scan time and front-panel lock status.

#### **Note on RS-232 port availability on your PC**

Most PCs and notebooks do not have a serial port. So to program the Switch you may need a USB to RS-232 Serial converter. Please contact your Hall Research Technologies sales representative if you need to buy one.

The VS-4A will output a menu to a serial port on power-up. This menu will also be displayed when a "List" command is sent to it via a serial port. To view the menu, An ASCII serial terminal or terminal emulator software is needed. An example is Microsoft Windows® HyperTerminal (generally found in Accessories\Communication folder)

#### **. To configure HyperTerminal**

- Connect direct to any available COM port
- 4800 Baud, 8 bits, No Parity, 1 Stop bit, No flow control

## 4 Channel VGA Switch w/Audio & Serial Control

After power-up the unit will output the following menu in ASCII through its serial port:

```
Ver1.0
-----
1 = #1 In
2 = #2 In
3 = #3 In
4 = #4 In
a = Auto mode
s = Scan
b = Blank
u = Un-Blank
p = Priorities
r = Reset
l = Lock/Unlock
```

### 3.4 Serial Port Control Codes

(1 byte commands from external control device)

#### ASCII 1 (or Hex 31)

Selects Video input #1

#### ASCII 2 (or Hex 32)

Selects Video input #2

#### ASCII 3 (or Hex 33)

Selects Video input #3

#### ASCII 4 (or Hex 34)

Selects Video input #4

### ASCII a (or Hex 61)

Enters 'Auto' mode.

In Auto mode, the device automatically switches to the video & audio input source that is active. "Active" means that video signal has sync signal, it does not mean there is a non-static screen!

### ASCII s (or Hex 73)

Enters 'Scan' Mode.

The user is first prompted to enter the switching time delay from 1-60 seconds.

**"Seconds between switching? (1-60)"**

The users are then prompted to select whether 'non-active' video input channels should be scanned or not.

**"Scan non-active? (Y/n)"**

### ASCII b (or Hex 62)

Blanks the output. When the output is blanked, only the color intensities of the output are reduced to zero (resulting in a black screen), the unit still operates in normal fashion and sync signals are still routed to the output. Audio output is muted.

### ASCII u (or Hex 75)

Un-blanks the output.

### ASCII p (or Hex 70)

Selects video input priorities.

The device will ask for the priorities for each of the four inputs via a prompt the user must respond to.

**“In X is [Y] (1-4)?” Where ‘X’ is the Video input and ‘Y’ is its current priority.**

Entering ‘0’ for a video input priority will keep the existing priority.

Priority can range from 1 to 4, 1 being the highest and 4 being the lowest.

For example, if Video #1 priority is set at 1, the unit will select input #1 automatically whenever the presence of the video at Video 1 input is detected even if the input from the Video 2 input is currently playing. If no video is detected for a specific video input, the next video input is selected based on the priority setting in order.

### ASCII r (or Hex 72)

Reset the unit back to factory defaults.

Priorities are set to 1,2,3,4

Scan time is set to 5 seconds

Front panel is unlocked

### ASCII I (or Hex 6c)

Toggles the Front Panel key lock setting.

## 4. Troubleshooting

### 4.1 In Case of Trouble

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please first make sure that all your connections are solid, and check the state of the LED's on the front of the unit to access the mode it is in.

If you still cannot overcome the problem, disconnect the video and audio input connections from the unit. Unplug the power from the unit and after a few seconds reconnect power. Connect your audio and video signals after the unit is powered up. Check performance.

### 4.2 Calling Hall Research Technologies

If you determine that your unit is malfunctioning, do not attempt to repair the unit. Contact HRT Tech. Support at 714-641-6607 or via email or web

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem;
- The components involved in the problem—that is, what type of cable, makes and models of computers and monitors, etc.
- The results of any testing you've already done.

### 4.3 Shipping and Packaging

If you need to transport or ship your VS-4A:

- Package it carefully. We recommend that you use the original container.
- Before you ship the unit back to Hall Research Technologies for repair or return, contact us to get a Return Authorization (RA) number.

## 5. Specifications

**Video Inputs** VGA, RGBHV, RGBS, RGsB, or Component Video (YPbPr – would require HD15 to 3 RCA adapter)

**Resolutions**

**Supported** PC from VGA to UXGA (640x480 to 1600x1200)  
HD from 480p to 1080p

**Audio Inputs** PC or Consumer audio (standard line-level)

**Video Level** 0 to 0.7V p-p on RGB, 0 to 5 V for H and V Sync

**Bandwidth** 200 MHz

**Max Altitude** 10,000 ft (3048 meters)

**Temperature** Operating: 32 to 122°F (0 to 50°C);  
Storage: -40 to +185°F (-40 to +85°C)

**Humidity** Up to 95% non-condensing

**Enclosure** Steel

**MTBF** 90,000 hours (calculated estimate)

**Power** 6V center positive power supply

**Size** 1.7" (43mm) H x 8.42" (213mm) W x 2.75" (70mm) D

**Weight** 2.0 pounds (800 grams) Shipping





Product Designed and Made in the USA

