Model VS-2A-PRG
2-Port VGA Switch with Audio, Serial Control & EDID Programming

UMA1156 Rev C

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1.0 General

Thank you for purchasing the Hall Research Model VS-2A-PRG 2-Port VGA Switch with Audio, Serial Control and EDID Programming capabilities.

This unit provides a video along with audio output that can be switched between two video and audio sources. The unit also has a loop-out for PC #1 Input for connection to a local LCD.

The VS-2A-PRG unit provides all the A/V and control connections on the rear panel; the front panel has a push-button switch with corresponding LED indicator for the selection of video source. The front panel also features mode selection buttons to allow the unit to operate automatically (based on video sync detection). This unit can be controlled either manually using the front panel switch, automatically based on video sync detection, or remotely through an RS232 serial port.

The unit can be configured to operate in two different modes, which are Auto and Manual modes. There is a priority selection that can be used to set for none, Input #1 or Input #2. Switched output can be blanked and un-blanked either from the front panel button or from the PC command sending through the serial port.

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

The unit also has the capability to read the EDID (Extended Display Identification) information from the device connected to the SW OUTPUT VGA Connector. This information is stored in the VS-2A-PRG EEPROM and can be written to another device that supports EDID such as the Hall Research Mini-Cat Sender (UV1-S) or an EDID Emulator plug (EMU-EDID-HD15). This will allow the PC that the Mini-Cat sender (or EDID Emulator) is connected to emulate the actual monitor connected to the Mini-Cat receiver (or other Hall Research product).

2.0 Features

- ✓ Read and Write EDID Information
- ✓ Capability to download EDID info from PC into unit
- ✓ Allows one video with stereo audio to be switched between two video and audio sources
- ✓ Loop-out for input #1 audio and video
- ✓ Can be manually controlled by push-button switch buttons or remotely by RS232 communication port
- ✓ Provides Auto mode to automatically select input source
- ✓ Auto Mode priority can be set for input #1, input #2 or no-priority
- ✓ Switched output can be blanked and un-blanked
- ✓ Stores the last selection and mode in EEPROM
- ✓ Compact, Rugged, Reliable, and Economical
- ✓ Made in USA

3.0 Installation

. Required Cables

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

NOTE: For EDID Programming the only cables required are for the Monitor and the RS232 connection.

. Inputs & Outputs

The VS-2A-PRG has 2 video and audio inputs: PC 1 Input and PC 2 Input. The unit has 1 video and audio output: SW Output. There is a local video and audio output, which is a loop-out for PC 1 Input: Local.

. Connecting the VS-2A-PRG

NOTE: For EDID Programming, ONLY CONNECT THE RS232 cable and the 'SW OUTPUT' Connector to the device to read/write the EDID information. No connections should be made to the 'PC1 Input' and 'PC2 Input' connectors.

Connect your video and audio sources such as computer or notebook PC to PC 1 Input and PC 2 Input. If the loop-out for input #1 is desired, it can be connected to local video and audio.

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

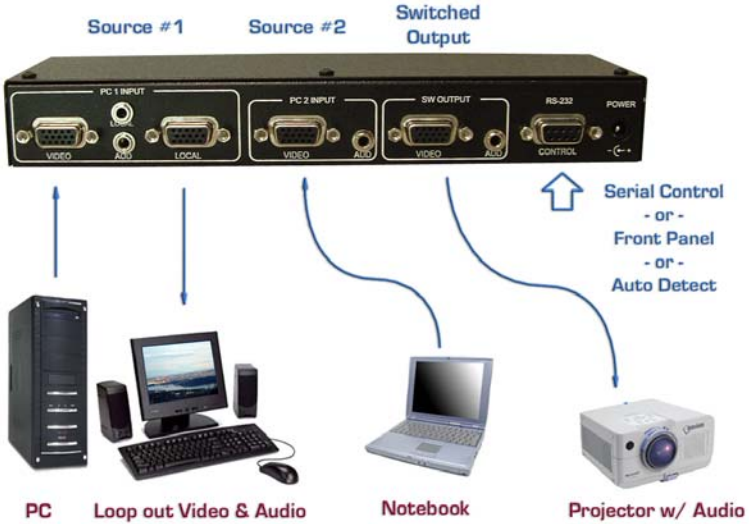Connect the included power supply to the VS-2A-PRG.

Select the desired mode of operation including the priority 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-2A-PRG.

VS-2A Rear Panel

. Connection Diagram

4.0 Operation

. Switched Output

The switched output SELECT button is used to select between video & audio input sources of PC 1 and PC 2. A solid-on LED is used to indicate which input is selected.

Holding down the switched output SELECT button for 3 seconds will blank the current selected input source (and mute the audio output). The LED for the current selected input will start blinking to indicate the blanking mode. Pressing the SELECT button again will un-blank the output and un-mute the audio on the switched out.

VS-2A Front Panel

. Modes of Operation

The unit can operate in either Auto or Manual mode by pressing the mode button to select it.

In Auto mode, the VS-2A-PRG will automatically select the input with active video and audio. The presence of video is determined by examining the V. Sync signal of the input connectors. The front panel SELECT button cannot be used to switch between PC 1 and PC 2 input sources in this mode. However, it can be used to blank the output by holding it down for 3 seconds or to un-blank the output by pressing it once.

In Manual mode, the output of the VS-2A-PRG will depend on the selection of the switched output SELECT button.

. Front Panel Lockout

The Front panel controls can be locked so that the unit's configuration will remain unchanged until the front panel is unlocked or the configuration is changed via the serial port.

To lock or unlock the front panel, hold the Priority Selection button for 3 seconds. All the front panel lights will flash to signify the status change.

If the units front panel is locked and the user presses any of the buttons, the front panel led's will flash rather than changing the selection.

. Priority Selection in Auto Mode

The priority button is used to select the priority as none, input #1 or input #2. This priority selection only applies to the Auto mode. If INP 1 priority is selected, the VS-2A-PRG will automatically select input #1 whenever it detects the presence of video at the PC 1 input, regardless of what is happening at input #2. If INP 2 priority is selected, the VS-2A-PRG will automatically select input #2 whenever it detects the presence of video at the PC 2 input, regardless of what is happening at input #1. For example with INP 1 Priority set, if the output is playing the video & audio from PC 2 input and the video from PC 1 input is detected, the output of the VS-2A-PRG will select PC 1 (input #1) immediately. With priority set to none, the unit stays selected to the current input as long as it is detecting video there.

. RS-232 Control

The VS-2A-PRG 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, and priority buttons.

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. These are available from Hall Research (Model USB-RS232-1).

The VS-2A-PRG will output a menu to a serial port on power-up. This menu will also be displayed when a proper 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 the VS-2A-PRG directly to any available COM port on your PC. This could possibly be through a USB converter also.
- 4800 Baud, 8 bits, No Parity, 1 Stop bit, No flow control
- **Ensure that there is a 50ms delay between characters transmitted to the VS-2A-PRG if you are going to use the "Z" command to download the Binary EDID data to the unit.**

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

```
----------------------
        M E N U
----------------------
1 = PC 1 Input
2 = PC 2 Input
F = Front Panel Lock
A = Auto Mode
M = Manual Mode
P = Priority Select
N = No Priority
B = Blank
U = Un-blank
S = Status Report
L = List Menu

E = EEProm Select Byte
V = Version Info
R = Read EDID Info
W = Write EDID Info
D = Dump E2P EDID Info
Z = Edit E2P EDID Info
```

. Control Codes (1 byte commands from external control device)

ASCII 1 (or Hex 31)

> Selects input #1 (immediately and unconditionally). The device will respond with: **PC 1 Input selected**

ASCII 2 (or Hex 32)

> Selects input #2 (immediately and unconditionally). The device will respond with: **PC 2 Input selected**

ASCII F (or Hex 46)

> Toggles the Front Panel Lock Status. The device will respond with: **Front Panel Locked** or **Front Panel Un-Locked**
>
> When the Front Panel is locked, no changes can be made via the front panel buttons except to unlock the Front Panel.
>
> The Front Panel is Locked or Unlocked by holding the Priority Selection Button for 3 seconds. All the front panel lights will flash to signify the change in status.

ASCII A (or Hex 41)

> Enters Auto mode. The device will respond with: **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 M (or Hex 4D)

> Enters Manual mode. The device will respond with: **Manual mode**
>
> In Manual mode, the device stays on the currently selected video & audio, regardless of the presence of video signal.

ASCII P (or Hex 50)

>Toggles the Input Priority Selection. The device will respond with: **PC 1 priority selected** or **PC 2 priority selected**

>If input #1 priority is selected, the unit will select input #1 automatically whenever the presence of the video at PC 1 input is detected even if the PC 2 input is currently playing.

>If input #2 priority is selected, the unit will select input #2 automatically whenever the presence of the video at PC 2 input is detected even if the PC 1 input is currently playing.

ASCII N (or Hex 4E)

>Selects no priority. The device will respond with: **No priority selected**

ASCII B (or Hex 42)

>Blanks the output. The device will respond with: **Blanked** When the output is blanked, only the color intensities of the output are reduced to zero, the unit still operates in normal fashion and sync signals are still routed to the output. Audio output is muted.

ASCII U (or Hex 55)

>Un-blanks the output. The device will respond with: **Un-blanked**

ASCII S (or Hex 53)

Request the status report. The device will respond with:

```
        Status Report
--------------------------------
Input    = 1 (or 2)
Mode     = Auto (or Manual)
Priority = 1 (or 2 or None)
Blank    = On (or Off)
Front Panel Un-Locked (or Locked)
```

This report displays the current selection of switched output, mode, priority buttons and Front Panel Lock Status.

ASCII L (or Hex 4C)

Displays the menu. The device will respond with a menu identical to the menu displayed at power-up.

This menu lists all the ASCII commands to control the VS-2A-PRG unit via a serial port.

ASCII E (or Hex 45)

Displays the internal EEProm Selection Byte. This is for Hall Research purposes only and provides the end user no other functionality.

ASCII V (or Hex 56)

Displays the Firmware Version number.

ASCII R (or Hex 41)

Reads the EDID information from the device connected on the SW OUTPUT connector. (If no device is connected, all 0xFF characters will be read).

ASCII W (or Hex 57)

Writes the information stored in the internal EEProm memory into the EDID device connected on the SW OUTPUT connector.

ASCII D (or Hex 44)

Displays the data in the internal EEProm memory in a tabular format. For Example:

```
-E2Prom Memory Dump
        0    1    2    3    4    5    6    7    8    9
     ----------------------------------------
   0 |  00   FF   FF   FF   FF   FF   FF   00   4C   2D
  10 |  FF   01   00   00   00   00   2A   0F   01   03
  20 |  68   59   32   8C   2A   32   BD   A1   5B   4A
  30 |  98   24   15   47   4A   AD   CE   00   01   01
  40 |  01   01   01   01   01   01   01   01   01   01
  50 |  01   01   01   01   66   21   50   B0   51   00
  60 |  1B   30   40   70   36   00   75   F2   31   00
  70 |  00   1E   64   19   00   40   41   00   26   30
  80 |  18   88   36   00   75   F2   31   00   00   18
  90 |  00   00   00   FD   00   3C   4B   1E   3D   09
 100 |  00   0A   20   20   20   20   20   20   00   00
 110 |  00   FC   00   53   41   4D   53   55   4E   47
 120 |  0A   20   20   20   20   20   00   C6
```

ASCII Z (or Hex 5A)

Allows the user to download 128 bytes of binary data from a PC into the unit's internal EEProm memory**. Ensure that HyperTerminal has been configured for a 50ms delay between writing the characters.** If you attempt to download without the delay, the unit will think it hasn't received everything and will fail to respond to operator input.

5.0 EDID Programming

- Connect the monitor desired to read the EDID information from to the SW OUTPUT Connector.
- Connect the PC to the RS232 port
- On the PC, run and configure HyperTerminal to read the COM port with 4800, 8, none, 1 and No handshake. See the paragraph titled "**To configure HyperTerminal"** above for more information if necessary.
- Power the VS-2A-PRG and the Monitor
- HyperTerminal will display the power-on menu.
- Hit the "R" key once and HyperTerminal will show a series of HEX digits appear that were read from the connected monitor. A display 'Similar' to below will be shown (the actual data displayed will depend on the device connected to the SW OUTPUT Connector):
  00FFFFFFFFFFFF00106C901991030000280F01037A241D782
  FEC59A5584A9A26215256BFEF80714F814081800101010101
  0101010101BC34009851002A40109013006D241100001E0000
  00FD00284C1E510E000A202020202020000000FF0020202020
  20202020202020202020000000FC0044434C4344202044434C394
  30A00E5
- Disconnect the Monitor from the SW OUTPUT Connector
- When programming a Mini-Cat sender, connect the Mini-Cat to the SW OUTPUT Connector and power up the Mini-Cat. If programming an EDID emulator, plug in the emulator into the SW OUTPUT connector.
- Hit the "W" key once and HyperTerminal will show a series of ".' characters for each HEX byte written to the Mini-Cat such as:
  ....
  ....

NOTE
The operator should be very certain about what is connected to the SW OUTPUT connector before hitting the 'W' key. If a video monitor is connected to the SW OUTPUT connector and 'W' is pressed, the monitors EDID information could be accidentally overwritten and unless previously saved, unrecoverable.

6.0 Troubleshooting

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 assess 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.

Do not open or try to repair the unit yourself. There are no customer repairable items in the unit and you will void your warranty.

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

7.0 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 1920x1440)
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 5V for H and V Sync

Bandwidth 200 MHz

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

Enclosure Steel

MTBF 90,000 hours (calculated estimate)

Power 6V center positive via supplied Universal power supply
(100~240VAC).

Size 1.3" (33mm) H x 9" (229mm) W x 2.6" (66mm) D

Weight 1.1 pounds (500 grams)

Product Designed and Made in the USA