



Hall Research Technologies, Inc.

Model DVS-2A

2-Port DVI Switch with Audio, Serial Control & Long Cable Equalization




UMA1127
Rev B

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Federal Communications Commission Statement

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. This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user, at their own expense, will be required to take whatever measures are necessary to correct the interference.

European Union Declaration of Conformity

This product has been tested and shown to comply with the requirements of the European EMC directive 89/336/EEC.



Table of Contents

1.0 General	3
2.0 Features.....	4
3.0 Installation	5
. Required Cables.....	5
. Inputs & Outputs	5
. Connecting the DVS-2A.....	5
. Connection Diagram.....	6
4.0 Operation	7
. Switched Output	7
. Modes of Operation.....	7
. Priority Selection in Auto Mode.....	8
. Long Cable Equalization	8
. RS-232 Control Port Usage	8
. To configure HyperTerminal.....	9
. Serial Port Control Codes.....	10
5.0 Troubleshooting.....	14
6.0 Specifications.....	15

1.0 General

Thank you for purchasing Hall Research Technologies' DVS-2A 2-Port DVI Switch with Audio & Serial Control.

This unit provides both a video and audio output that can be switched between two video and audio sources. This allows routing of multiple DVI equipped devices (such as PC's) to a single DVI display (such as a plasma or LCD screen). The switcher supports single-link, DVI-D video signals at resolutions up to 1920x1200 and HDTV up to 1080p.

The DVS-2A 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 signal detection).

This unit can be controlled by either manually using the front panel switch, automatically based on video detection, or remotely through an RS232 serial port.

The unit can be configured to operate in two different modes: Auto and Manual.

There is a priority selection that can be set for the 'Input 1' DVI connector. The switched output can be blanked and un-blanked either from the front panel button or from a command sent from a PC to the serial port.

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

2.0 Features

- ✓ Clear and sharp images at resolutions up to 1920x1200 including HDTV up to 1080p
- ✓ Hot pluggable
- ✓ Supports the DDC2 standard for all input ports
- ✓ HDCP & HDMI 1.3 Compatible
- ✓ Allows one video with stereo audio to be switched between two video and audio sources
- ✓ Can be manually controlled by push-button switches, remotely by a RS232 communication port
- ✓ Provides an Auto mode to automatically select input source
- ✓ Auto Mode priority can be set for input #1 or no-priority
- ✓ Switched output can be blanked and un-blanked
- ✓ Video Cable Equalization available for long cabling
- ✓ Stores the last selection and mode in EEPROM
- ✓ Compatible with the Universal Mounting Bracket
- ✓ Ships with universal (100~240 VAC) power supply
- ✓ Compact, Rugged, Reliable, and Economical
- ✓ Made in USA

3.0 Installation

. Required Cables

The video input cables are generally DVI male to male (customer furnished). The Audio inputs are 3.5 mm mini-stereo (customer furnished). To connect to the unit to a Serial port (such as PC's COM1) you would need a Male/Female DB9 Serial Cable (customer furnished).

All of these items are available for purchase upon request.

. Inputs & Outputs

The DVS-2A has 2 video and audio inputs labeled 'Input 1' and 'Input 2'. The unit has 1 video and audio output labeled 'Output'.

. Connecting the DVS-2A

Connect your video and audio sources such as computer or notebook PC to 'Input 1' and 'Input 2'.

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 DVS-2A.

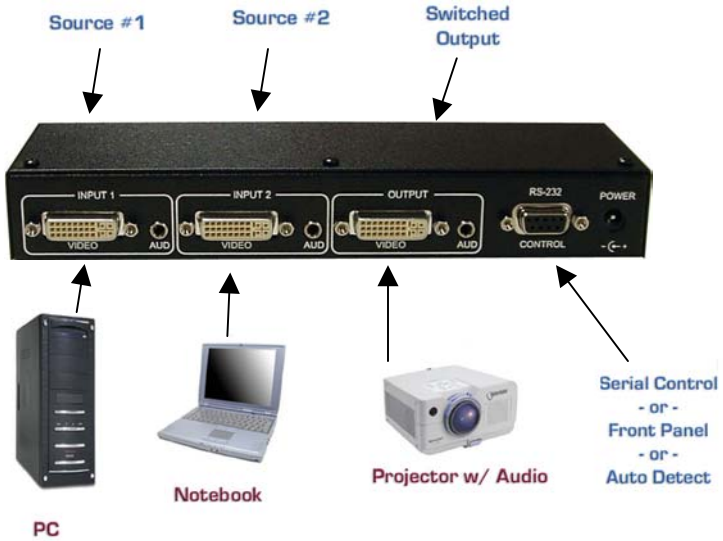
Select the desired mode of operation including the priority for your video and audio output using the front panel switched buttons.

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 DVS-2A.

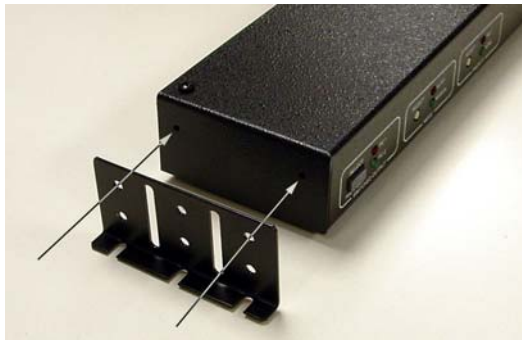
The device can be mounted via a Universal Mounting Bracket (sold separately) if desired.

2-Port DVI Switch with Audio & Serial Control

Connection Diagram



MODEL DVS-2A REAR PANEL



Universal Mounting Bracket

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 switched output SELECT button again will un-blank the output and un-mute the audio on the switched out rear connector.



MODEL DVS-2A FRONT PANEL

. Modes of Operation

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

In Auto mode, the DVS-2A will automatically select the input with active video and audio. The presence of video is determined by examining the V. Sync signal or optionally the +5 VDC signal from DVI input connectors. The front panel switched output SELECT button cannot be used to switch between 'Input 1' and 'Input 2' sources in this mode. However, the switched output SELECT button 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 DVS-2A will depend on the selection of the 'Switched Output' SELECT button.

. Priority Selection in Auto Mode

The priority button is used to select the priority as NONE or as INPUT 1.

This priority selection only applies to Auto mode. If INP 1 priority is selected, the DVS-2A will automatically select 'Input 1' whenever it detects the presence of video at 'Input 1' connector, regardless of what is happening at the 'Input 2' connector.

For example, if the 'Output' is playing the video & audio from 'Input 2' and video from 'Input 1' is detected, the output of the DVS-2A will change to select 'Input 1' video immediately. With priority set to none, the unit stays selected to the current input as long as it is detecting video there.

. Long Cable Equalization

The use of long DVI cables can cause the 'Video' image to degrade to unacceptable levels.

By pressing and holding BOTH the 'Mode SELECT' and 'Priority SELECT' buttons for 3 seconds, the video boost circuit will be enabled and the LED's will flash momentarily acknowledging the selection was changed. Both of the GREEN LED's flash when the BOOST is enabled and the RED LED's flash when the BOOST is disabled.

. RS-232 Control Port Usage

The DVS-2A 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 the 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 Technologies (Model USB-RS232-1).



2-Port DVI Switch with Audio & Serial Control

The DVS-2A will output a menu to the serial port on power-up. This menu can also be displayed when the appropriate command is sent to the DVS-2A via the 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 the 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
- Settings per following figures:



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

```
MENU - Version 1.0
-----
1 = PC 1 Input      | B = Blank
2 = PC 2 Input      | U = Un-blank
A = Auto mode       | E = Enable boost
M = Manual mode     | D = Disable boost
P = PC 1 priority   | R = Report
N = No priority     | F = Factory Defaults
                    | C = Command menu
-----
```

. Serial Port Control Codes

Control codes are 1 byte commands from an external device to the Serial Port on the DVS-2A.

ASCII '1' (Hex 31 or Decimal 49)

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

If the device is in AUTO mode, the device will respond with: **Error: The unit is in auto mode**

ASCII '2' (Hex 32 or Decimal 50)

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

If the device is in AUTO mode, the device will respond with: **Error: The unit is in auto mode**

ASCII 'A' or 'a' (Hex 41/61 or Decimal 65/97)

Enters Auto mode. The user must select the desired detection method by entering a number from 1 to 3 within 20 seconds. Values outside this range or delaying entry longer than 20 seconds will result in an error message:
Invalid entry! Current detection stays the same.

The device will respond with:
Auto mode selected

Detection Method

- **1 = Vertical sync**
2 = 5V Power
3 = Vertical sync & 5V power

Current detection is [3](1-3)?

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 'm' (Hex 4D/6D or Decimal 77/109)

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 'p' (Hex 50/70 or Decimal 80/112)

Selects Input #1 priority.

The device will respond with: **PC 1 priority selected**

If 'Input #1' priority is selected, the unit will select input #1 automatically whenever the presence of the video at the 'Input 1' DVI connector is detected even if the output from 'Input 2' is currently playing.

ASCII 'N' or 'n' (Hex 4E/6E or Decimal 78/110)

Selects no priority for Input #1.

The device will respond with: **No priority selected**

ASCII 'B' or 'b' (Hex 42/62 or Decimal 66/98)

Blanks the output.

The device will respond with: **Blank mode selected**

When the output is blanked, only the color intensities of the output are reduced to zero. The unit still operates in a normal fashion and sync signals are still routed to the output. The audio output is muted.

ASCII 'U' or 'u' (Hex 55/75 or Decimal 85/117)

Un-blanks the output.

The device will respond with: **Unblank mode selected**

ASCII 'E' or 'e' (Hex 45/65 or Decimal 69/101)

Causes the output signal equalization for long cabling to be enabled.

The device will respond with: **Boost enabled**

ASCII 'D' or 'd' (Hex 44/64 or Decimal 68/100)

Causes the output signal equalization for long cabling to be disabled.

The device will respond with: **Boost disabled**

ASCII 'R' or 'r' (Hex 52/72 or Decimal 82/114)

Request the status report. The device will respond with a display similar to below:

```
Report
-----
Input = 1
Mode = Auto
Priority = None
Blank = Off
Boost = Disabled
Detection method = Vertical sync
```

This report displays the current selection of the switched output, mode, and priority buttons.

ASCII 'C' or 'c' (Hex 43/63 or Decimal 67/99)

Displays the menu. The device will respond with:

```
MENU - Version 1.0
-----
1 = PC 1 Input      | B = Blank
2 = PC 2 Input      | U = Un-blank
A = Auto mode       | E = Enable boost
M = Manual mode     | D = Disable boost
P = PC 1 priority   | R = Report
N = No priority     | F = Factory Defaults
                   | C = Command menu
```

ASCII 'F' or 'f' (Hex 46/66 or Decimal 70/102)

Causes the system to be reset to its DEFAULT factory settings.

The device will respond with: **Factory default restored**

ASCII 'v' (Hex 76 or Decimal 118)

Causes the system to display the firmware version number.

The device will respond with:

Firmware Version: X.Y where 'X.Y' is the numeric version level of the firmware software.

5.0 Troubleshooting

Make sure that all your connections are solid, and check the state of the LED's on the front of the unit.

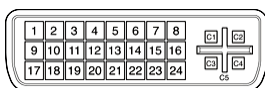
Do not open or try to repair the unit yourself. There is no customer repairable item in the unit and you will void your warranty. Contact HRT Support at 714-641-6607 or via email or web. If you need to ship your switch for repair, make sure to get a Return Material Authorization (RMA) number first.

Cable Length Limitations

The switcher cannot be used as an extender. Therefore it is best to plug the output of the switch directly to the display device and use input cables that are 5 meters (16 ft) maximum. In other words, try to keep the total length of cables from the video source to the box and from the box to the monitor should not exceed 16 feet. At longer distances you may experience video degradation. If you cannot use shorter cables, try to set the refresh rate and/or resolution of the video signal to a lower level.

6.0 Specifications

Video Inputs	DVI-D Single Link, HDCP & HDMI 1.3 Compliant
Resolutions	PC resolutions up to 1920x1200 @ 60 Hz and HDTV to 1080p
Audio Inputs	PC audio outputs
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
Size	1.3" High x 8.5" Wide x 2.6" Deep
Weight	1.1 pounds



DVI Connector pin out N/U = Not Used

Pin	Signal name	Pin	Signal name
1	TMDS Data2-	13	TMDS Data3+ (N/U)
2	TMDS Data2+	14	+5V Power
3	TMDS Data2/4 Shield	15	Ground for +5V Power
4	TMDS Data4- (N/U)	16	Hot Plug Detect
5	TMDS Data4+ (N/U)	17	TMDS Data0-
6	DDC Clock	18	TMDS Data0+
7	DDC Data	19	TMDS Data0/5 Shield
8	Analog vertical sync	20	TMDS Data5- (N/U)
9	TMDS Data1-	21	TMDS Data5+ (N/U)
10	TMDS Data1+	22	TMDS Clock Shield
11	TMDS Data1/3 Shield	23	TMDS Clock+
12	TMDS Data3- (N/U)	24	TMDS Clock-
C1	Analog red	C4	Analog horizontal sync
C2	Analog green	C5	Analog ground
C3	Analog blue		



Product Designed and Made in the USA

