

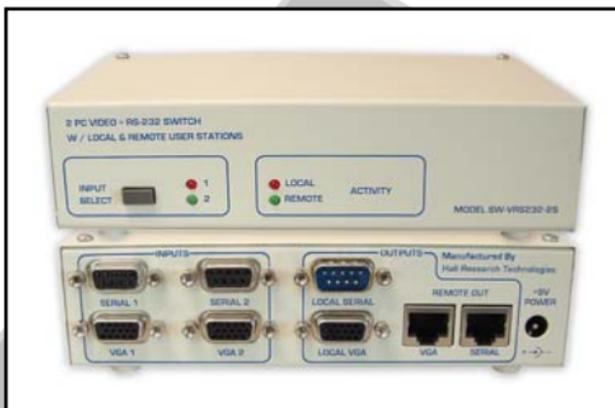


Hall Research Technologies, Inc.

Model SW-VRS232-2

2-PC video and Serial Switch

With Local and Remote User Stations



UMA1162 Rev. A

SUPPORT & ORDERING INFORMATION

For technical support, Call **714-641-6607** or fax **714-641-6698**

Order by phone: **toll-free** in the U.S. **800-959-6439**

Web site: www.hallresearch.com

Hall Research Technologies, 1163 Warner Ave. Tustin, CA 92780

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This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been designed to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. *This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.*



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1. Introduction

1.1 General

This manual covers both sender (Model SW-VRS232-2S) and remote (Model SW-VRS232-2R), available either separately, or as a set.

The Hall Research 2 input switch/extender is a powerful, yet simple 2x1 VGA and RS-232 switch. It allows one or two users to select between 2 PC's, and access the selected PC's Serial RS-232 port and VGA video. A typical installation would be connecting a touch-screen LCD to the unit and then be able to switch the touch-screen LCD between 2 PC's.

The local user can connect to the Sender unit. To add a remote user, an optional 2-gang wall plate would be needed. The optional wall plate connects to the local unit via 2 Catx cables. No power supply is required for the wall plate. One Catx cable is used to extend the Video and the other is used to extend bi-directional RS-232. The Remote unit can be located up to 500ft. away from the Sender Unit.

The user at the Sender station can switch between the 2 PC's by simply pushing a button on the unit's front panel. LED indicators provide feedback as to which PC input is selected.

The Remote station controls the same PC as the local (both displays show the same image). Any RS-232 output from the PC is sent to both Stations, and RS-232 data from each station is automatically multiplexed as a first-come-first-served basis. This means that, for example, if the sender station is sending RS-232 data to the selected PC, the RS-232 data from the Remote station is ignored until the Sender station stops transmitting data for about a second. In this way collision of Rx data is prevented.

If control of the input selection is needed at the remote station, an optional push button switch cord can be utilized (Model PB-SW). This push button plugs into the receiver wall plate and can sit by the remote LCD. It has a momentary button with built-in LED. Every time the switch is pressed the input selection is toggled between PC 1 and PC 2. The LED on the remote push button cord blinks once when PC 1 is selected, and twice when PC 2 is selected. The push button is only available in a 6ft. length, but can be easily extended since it uses a standard 3.5mm mini-stereo type of plug.

1.2 Features

- Supports High Resolutions up to UXGA (1600x1200)
- Sender drives video and serial up to 500 ft.
- Auto-detect serial activity allows only one user to control serial RS-232 at a time.
- Single switch operation from either local or remote stations
- Only one power supply needed (power sent over Catx to receiver)
- 2-gang wall plate receiver and mountable sender for clean installation
- Compact, Rugged, Reliable, and Economical
- Made in USA

VGA –RS232 SWITCH AND EXTENDER

2. Installation

2.1 Connecting the SW-VRS232-2S

System Block Diagram:

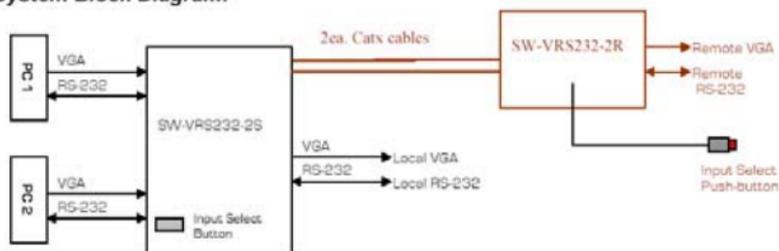


Figure 2.1

1. For connection to a typical PC, use HD15 M/M cables for Video, and straight-through DB9 M/F cables for RS-232. Connect all devices to the unit and then connect the Power supply to the device.

Front View



Rear View



Figure 2.2 SW-VRS232-2S

2.2 Connecting the SW-VRS232-2R

1. If the optional 2-gang wall plate receiver (Model SW-VRS232-2R) will be used, make sure to plug the Catx cables to the correct connector on both ends. The unit is designed so that there is no damage if the cables are cross connected since the power distribution uses the same pins in the UTP cable, but if plugged incorrectly, the system will not work.



Figure 2.3

**SW-VRS232-2R
Receiver**



2. The remote user can switch between PC's by using an optional push-button switch, (Model # PB-SW). When pushed, an LED in the switch will blink to indicate which PC is selected – once for PC 1, twice for PC 2.

3. Video compensation is set with the receiver running, prior to installing the wall plate. Adjustment is made via a small potentiometer on the back of the video board, labeled "CABLE ADJ". Start with the compensation pot turned fully CCW (no compensation); then gradually increase until video image bleeding is eliminated. See Section 3 for cable type and video considerations.

VGA –RS232 SWITCH AND EXTENDER

Note about Touch-Screen LCD's

The system is designed to work the touch-screen LCD's that use RS-232. USB touch-screens are not supported even if an adapter is used.

When 2 stations are used (local and remote), you must ensure that both touch-screens are **exactly** the same make and model. This is because there is no software or special driver used with this setup and the PC is not aware that there are 2 touch-screens, therefore the calibration of both LCD's need to be identical.

To calibrate the touch-screen driver of each PC (geometry targets), it is recommended to use the local touch-screen. First select PC 1 and then enter the calibration screen of PC 1 where you are required to touch a few targets that are displayed on the screen. Once PC 1 is calibrated, select PC 2 and repeat the process. If the 2 touch-screen LCD's are identical, then the remote touch screen's calibration should be correct.

2.3 Mounting the SW-VRS232-2S

The SW-VRS232-2S provides mounting keyholes to secure the unit for a clean and simple installation.

Before you start:

To avoid risk of electric shock, do not install screws where power or data lines may be present, such as near electrical outlets, switches, or server rooms. Always use safety glasses when working with power tools.

1. Use the stencil sheet provided with the Sender to find an acceptable location for the unit. Once correctly positioned, tape the stencil down to secure it.

2. Drill pilot holes where indicated on the stencil, using a 1/16" bit.
3. **Screw Selection:** Be sure to use the appropriate kind of screw for the surface the unit is being mounted to. It is recommended to use a 1" long, #6 screw (shank = 0.138, or about 9/64").
4. Remove the stencil and install screws, leaving 0.19" (about 3/16") of the threads protruding (when measuring, do not include the screw head).

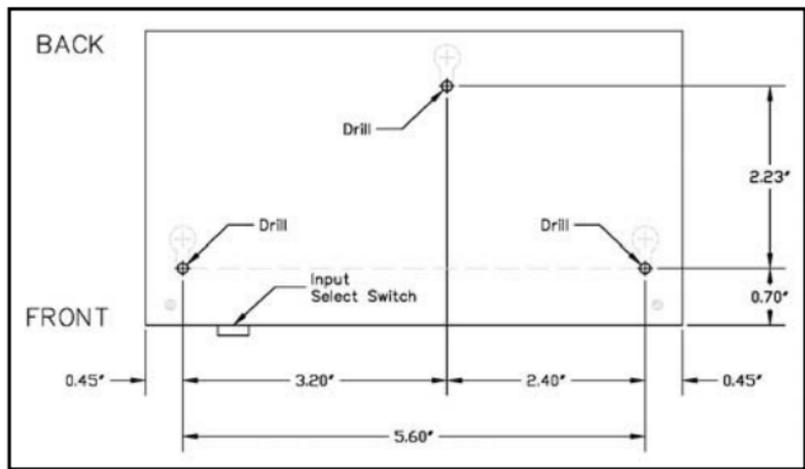
CAUTION:

Improper installation of mounting screws may result in damage to unit. A screw protruding 0.40" (or more than about 3/8") will hit the circuit board, causing possible damage. Additionally, the unit will not be securely mounted, which may cause it to fall. Measure screws for proper height prior to securing the unit.

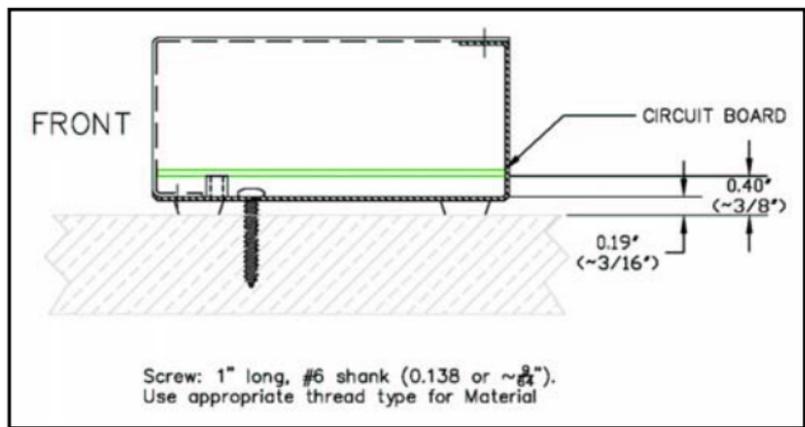


SW-VRS232-2S Bottom View of Keyhole Mounts

VGA -RS232 SWITCH AND EXTENDER



Stencil - Top View with Dimensions (NOT TO SCALE)



Side View with Clearance Dimensions (NOT TO SCALE)

3. Configuration and Operation

3.1 Front Panel LED Indicators

The SW-VRS232-2S has two sets of LED indicator lights. The Input Select LEDs indicate which input is currently selected. The Activity LEDs light when RS-232 data is being received, and indicate whether it is coming from the local station or the remote.

3.2 Adjusting Remote video quality for long cables

The video quality at the remote station depends on: (1) the length of the Cat5 cable, (2) video resolution setting, and (3) refresh rate setting.

In general, at low and mid resolutions, excellent image reproduction is provided at up to 500 feet. At high resolution and refresh rates perfect image reproduction can be achieved at shorter distances (see table below). Using longer cables or higher resolution rates will still produce an image, but the reproduction quality will be reduced.

Maximum Recommended Cable Lengths
Table 3.1

| | | Refresh Rate | | |
|------------|-----------|--------------|--------|--------|
| | | 60 Hz | 75 Hz | 85 Hz |
| Resolution | 800x600 | 500 ft | 500 ft | 500 ft |
| | 1024x768 | 500 ft | 450 ft | 400 ft |
| | 1280x1024 | 400 ft | 350 ft | 300 ft |
| | 1600x1200 | 300 ft | 300 ft | 300 ft |

3.3 UTP Cable Recommendations

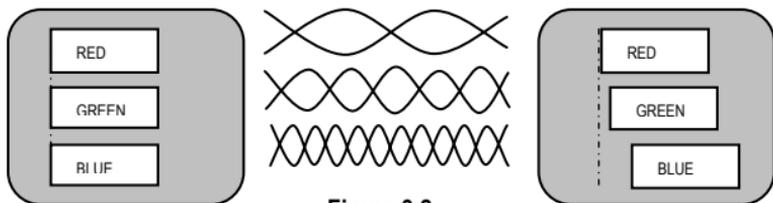


Figure 3.2

UTP cables have 4 twisted pairs inside. The video transmission over UTP uses 3 individual pairs for each color (Red, Green, & Blue). As shown in figure 3.2 above, a characteristic of Category-5/5e/6 cable is that the pairs of wires are twisted at different rates. Therefore, for a given length of Cat-5 cable the total length of a particular pair could be longer than others. Since the signals travel in the cable at a fixed speed, the arrival times of signals can be skewed in a long cable (those that have to travel farther arrive later and the corresponding color shifts to the right).

This is seen on the monitor as separation, or lack of convergence in colors. For example a vertical white line on the screen may look to have a red tinge on the left edge and blue tinge on the right edge.

This effect gets worse at high resolutions, high refresh rates, long cables (in excess of 200 feet), and depends on the cable construction itself. Hall Research highly recommends the use of UTP cables specifically constructed for video transmission. In these cables the all the twisted pairs are the same length. They are available from several sources including Hall Research (part numbers shown below).

Zero-Skew CAT5 Cable for use with Hall Research CAT5 Products

| PART NUMBER |
|---|
| CUTP-Z-1000-BLK 1000 ft. Zero-Skew CAT5 cable. Bulk spool of 1000 ft |
| CUTP-ZP-1000-BLK 1000 ft. Zero-Skew CAT5 cable. Bulk spool of 1000 ft Plenum Rated |

If you are going to use commercial grade UTP cable, then we recommend using Cat5 or Cat5e rather than Cat6, since the twist ratio match is better in Cat5 cable.

4. Troubleshooting

Most common problems are caused by the following:

- Using different models of Touch-Screen monitors
- Crossed Cat5 cables.
- Using a Cat5 cable that is too long, not straight through, or not terminated properly
- Display device does not support the resolution that is being sent (in which case you should check operation without the extender first)

4.1 Contacting Hall Research Technologies

If you determine that your switch is malfunctioning, do not attempt to repair the unit. There are no user serviceable parts inside the unit. Opening the unit will void the warranty. Contact HRT's Tech. Support at 714-641-6607 to obtain an RMA (Return Authorization) number.

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.

4.2 Shipping and Packaging

If you need to transport or ship your device:

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

5. Specifications

| | |
|------------------------------------|--|
| Standards | Analog VGA Video (RGBHV), YPbPr, or RGB signals with sync-on-green. |
| Resolutions | All up to UXGA (1600x1200 / 60Hz), 1080p |
| Video Level | 0.7 v p-p on RGB, 5v p-p H/V sync |
| Bandwidth | 20 Hz to 450 MHz |
| Common Mode Noise Rejection | 100 dB @ 60 Hz, 70 dB @ 1 MHz, 50 db @ 10 MHz |
| Max Distance | Up to 500 ft. (152 meters) - See table 3.1 for details |
| Temperature | Operating: 32 to 122 Deg F (0 to 50 Deg C); Storage: -40 to +185 Deg F (-40 to +85 Deg C) |
| Enclosure | Steel |
| MTBF | 100,000 hours (calculated estimate) |
| Power | Via the included power adapter. Voltage: 9v DC Center-Positive. Average Power Consumption: 250mA (Sender) 250mA (Receiver) |
| Size (H x W x D) | Sender: 2.81" x 6.5" x 3.75" Receiver: 4.56" x 4.56" x 1.25" Sender has three mounting keyholes; see mounting section for details. |



Hall Research Technologies, Inc.

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