



Hall Research Technologies, Inc.

Miniature VGA over CAT5 Cable Extension System



Mini-CAT™ VGA Extension Made Easy



February 2003

**CUSTOMER
SUPPORT
INFORMATION**

Order toll-free in the U.S. 800-959-6439

FREE technical support, Call 714-641-6607 or fax 714-641-6698

Mail order: Hall Research Technologies, 3613 W. MacArthur Blvd. #612, Santa Ana, CA 92704

Web site: www.hallresearch.com • E-mail: info@hallresearch.com

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FEDERAL COMMUNICATIONS COMMISSION

RADIO FREQUENCY INTERFERENCE STATEMENT

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 and found 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 intended 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 his 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

The Model UV1 is a single channel UTP (CAT5) VGA video extender consisting of a sender (UV1-Sender) and a receiver (UV1-Receiver) sold as a pair. The sender converts a PC's VGA signal into a format that can be transmitted using a single inexpensive and commonly available Category-5 Unshielded Twisted Pair (UTP) cable with RJ45 connectors, which is used in most Local Area Networks.

At the receiving (remote) end the receiver is used to convert the UTP signal back to VGA.

The devices are housed in compact plastic enclosures and include connectors for the PC as well as RJ45 connectors for sending and receiving the video signal over Category-5 cable. Included with the pair of devices are: a small power adapter, and a short adapter cables for easy connection to the standard HD-15 connector of the PC.

The RJ45 output on the sender can drive CAT5 LAN cables to 300 feet (91 meters) with little to no degradation of video quality.

1.2 Features

- Eliminates the need for bulky , expansive and hard to build multi-coaxial cables for VGA extension
- Amplifies the signal for clean and crisp transmission
- Differential signaling eliminates ground loops and noise
- Handles resolutions up to 1280x1024 at any refresh rate
- Rugged, Reliable, Compact size
- Only one end requires power. Power supply can be connected at the sending or the receiving end whichever convenient.
- No software required
- Drive standard CAT5 cables to 300 feet

2. Installation

1. Connect the vga in (HD-15) connector of the UV1-Sender to the computer's video port using the supplied cable (see figure 2.1).

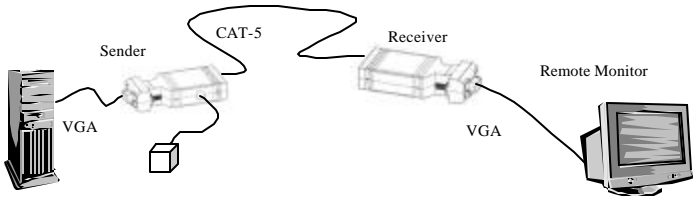


Figure 2.1

2. Connect the supplied power adapter to the power input connector on either of the units. Note that only one power adapter is used to power both the sender and receiver. It can be plugged into either of them.
3. Using Category-5 cable connect the UV1-Receiver to the unit's RJ45 output. Connect the remote monitor to the receiver.

NOTICE

Do not connect this unit to any LAN device such as network cards or hubs as this may cause damage. Use EIA/TIA 568B standard straight-through patch wiring as shown below. Do not use crossover cables.

EIA/TIA 568B WIRING STANDARD	
PIN	Wire Color
1	White w/ Orange Stripe
2	Orange
3	White w/Green Stripe
4	Blue
5	White w/Blue Stripe
6	Green
7	White w/Brown Stripe
8	Brown

The diagram shows an RJ45 connector with eight pins. Arrows point to Pin 1 and Pin 8, indicating the wiring standard.



Addendum

Model UV1-R

Mini-Cat® Receiver with Cable Compensation

✦ Long-Cable Compensation

The Mini-Cat® Receivers now are equipped with an adjustment to improve image quality when using long cables. The adjustment is made via a single turn trim-pot located next to the power connector on the receiver.

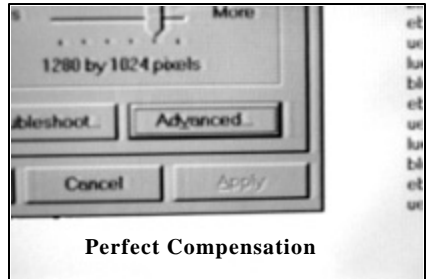
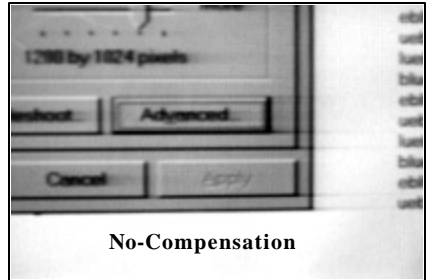
Refer to the images shown on the right. When using a long cable, with no compensation, any solid horizontal line, tends to smear to the right. For example in the image shown, observe the dark black line at the bottom of the window and see how it is smearing to the right (not changing to white abruptly as it should). This is the effect of long cable on the signal.

You can turn the trim-pot to eliminate these streaks as shown on the 2nd picture. If you add too much compensation to the signal, then an opposite effect may be observed, i.e. black lines smear to the right as white lines or vice-versa. The 3rd picture shows the case where too much compensation is added.

✦ Using Cables Longer than 300 feet

The Mini-Cat® system can operate with cables longer than 300 feet. In fact, you can get a decent picture at 500 feet or even at 800 feet (at lower resolutions). When using long cables here's a list of things to do to improve your picture quality:

- Normally the power adapter should be located at the sender, but at lengths approaching 300 feet, it is best to locate the power adapter at the receiving end!
- If the length of cable is approaching 400 feet or longer, you need to purchase an additional power adapter from Hall Research Technologies, Inc. and power both the sender and the receiver.
- Reduce your computer's video display refresh rate (60 Hz is best)



3. Configuration & Operation

Assuming that there are no major grounding or large EMI noise problems present, the video quality at the remote station depends on the length of the CAT5 cable, actual video resolution and refresh rate.

In general, at low and mid resolutions excellent image reproduction is provided at up to 300 feet. At high resolution and refresh rates perfect image reproduction can be achieved at shorter distances. Using longer cables or higher resolution rates will still produce an image, but the reproduction quality will be reduced.

For best results use Standard Category -5 Cable instead of CAT5e or CAT6. The CAT5e and CAT6 cables may have widely dissimilar twists per inch of the cable pairs resulting in noticeable color skew at lengths exceeding 150 feet.

4. Troubleshooting

1. Fuzzy, blurry, or ghosting image at remote location

If you have a stable image but it looks somewhat blurry (object or character edges are not sharp), check to see that you have not exceeded the maximum recommended cable length. If you still have a fuzzy image, try reducing the refresh rate and/or resolution of the PC. You may also wish to purchase a model UVA -2 and model URA. This pair of units allows cable lengths in excess of 500 feet, and include cable compensation switches to improve image quality at various distances.

2. Shaking image or periodically blanking monitor

Although CAT5 cable uses twisted pairs to transmit the signals from the splitter to the receivers to reduce the amount of EMI coupled noise from other external sources, a strong electromagnetic noise field can cause instability in the signal.

Usual sources of this form of noise coupling are high current AC lines or other high-density data and/or control cables that run adjacent to and parallel with a substantial length of the CAT5 cable. To eliminate this, either place a distance between the CAT5 cables from the splitter and the interfering source, or use shielded CAT5 cables. Note that separating the CAT5 cable from the EMI source by a few inches is often sufficient to eliminate this problem.

3. The PC does not recognize a Plug-and-Play monitor

If the PC's Operating System is setup to detect a plug-and-play monitor (usually in Display Properties Advanced Settings), it may have trouble finding a monitor if no local monitor is hooked up to the splitter. If the PC does not produce an image due to this, disable the plug-and-play monitor detection in the PC's operating system Display properties.

4. Substituting power supplies

The sender and receiver rely on the AC power adapter that is supplied with them. Do not substitute any other power supply or DC power source. If you need to run the devices from a different power source, contact the factory.

Calling Hall Research Technologies

If you determine that your extender is malfunctioning, do not attempt to repair the unit. Contact HRT's Tech. Support at 714-641-6607.

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.

Shipping and Packaging

If you need to transport or ship your extender:

- Package it carefully. We recommend that you use the original container.
- 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	VGA, SVGA, XGA, or XGA-2 video
Video Types	VGA through XGA, RGSB, or RGSB (sync on green") <i>Can also transmit Composite Video (CV), S-Video (Y/C), and Component Video (Y, P_b, P_r) (adaptor cable is needed)</i>
Resolution	Up to 1280 x 1024 non-interlaced at up to 85 Hz
Bandwidth	DC to 250 MHz
Max.Distance	Up to 300 ft. (91 meters)
Connectors	HD15 female for video in and out; Shielded RJ45
Interfaces	Standard Analog VGA; Proprietary CAT5
Compliance	Meets requirements for CE; FCC Part 15 Subpart B Class A, IC Class
Max. Altitude	10,000 ft. (3048 m)
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	Plastic ABS-94VO, UL File#56070
MTBF	300,000 hours (calculated estimate)
Power	From utility-power (mains) outlet, through included external power adapter. Output Voltage: 6v to 9v DC Center-Positive. Current requirement 500 ma max
Size	UV1-Sender & UV1-Receiver 0.8H X 1.7W X 4.5L
Weight	2 lbs. (shipping)

Accessories and other products from Hall Research Technologies

High Resolution Video
Distribution Amplifiers -
from 2 to 18 channels



VGA and Audio Splitters
over Cat 5 UTP Cable -
from 2 to 24 channels



VGA Matrix Switches -
from 4X4 to 16X16



NTSC/PAL-to-VGA
Converter and Switch with
Built-in Audio Switcher



PC-to-TV Scan Converters



KVM Switches, Extenders,
Station Doublers



Cables: Video, Audio, USB,
DVI, PS/2, Custom, etc





Products Designed and Made in the USA

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