XTENDEX^{TM} Series

VOPEX-C5SVA/C5SV-x

S-Video/Audio or S-Video Only Splitter/Extender

Installation and Operation Manual

(Receiver not included)

WARRANTY INFORMATION

The warranty period on this product (parts and labor) is one (1) year from the date of purchase. Please contact Network Technologies Inc at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 or visit our website at http://www.nti1.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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CHANGES

The material in this guide is for information only and is subject to change without notice. Network Technologies Inc reserves the right to make changes in the product design without reservation and without notification to its users.

⚠ **WARNING: Never connect the VOPEX-C5SVA-x Extender/Splitter to an ethernet card, ethernet router, hub or switch or other ethernet RJ45 connector of an ethernet device. Damage to devices connected to the ethernet may result.**

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Introduction

The XTENDEX Series VOPEX-C5SVA-x Cat5 Video/Audio Splitter/Extender is designed to enable one S-Video/Audio source to be viewed and heard in 4, 8, or 16 different remote locations. Remote monitors and stereo speakers can be located as much as 600 feet away from the source via Category 5 unshielded twisted-pair cable. The VOPEX-C5SVA-x also allows a local monitor and self-powered stereo speakers to be located near the source.

Optional- VOPEX-C5SV-x S-Video Only Splitter/Extender (No Audio Support)

Note: If the audio support is not present, please disregard all audio references.

The XTENDEX Series VOPEX-C5SVA-x S-Video/Audio Splitter/Extender is extremely simple to install and has been thoroughly tested to insure reliable performance. Through the use of Category 5 unshielded twisted-pair cable it is possible to economically increase the flexibility of a computer system.   Here are some of the features and ways this can benefit any workplace:

- Allows the placement of monitors and self-powered stereo speakers in different remote locations where only these parts are needed.

- Provides an additional local access port allowing the A/V source to viewed and heard locally.

- Compatible with all video sources supporting s-video.

- Provides crisp and clear resolution up to 800x600 @ 60Hz at 600 ft.

- Video quality adjustment is automatic for varying lengths of CAT5 cable

- 'Video Adjustment' button allows video quality to be re-adjusted without powering down the system. (Button on VOPEX-C5SVA only- video quality adjustment is performed at Receiver for VOPEX-C5SV.)

- Digital transmission of audio signals reduces any loss in quality.

- Audio frequency response is 20Hz to 20kHz, +/- 1dB.

- Compatible with all NTI A/V switches and splitters supporting s-video, enabling the joining of products to create a system that satisfies all networking needs.

## Materials

Materials Included with this kit:
- ✓ NTI VOPEX-C5SVA-x (4,8, or 16 ports) CAT5 S-Video/Audio Splitter/Extender
     -OR-
   NTI VOPEX-C5SV-x (4,8, or 16 ports) CAT5 S-Video Splitter/Extender
- ✓ 120VAC or 240VAC at 50 or 60Hz-5VDC/2.0A AC Adapter
- ✓ SVEXT-3-MM 4-pin miniDIN male-male s-video cable for connecting the VOPEX-C5SVA-x to the video source
- ✓ SA-3-MM 3.5mm stereo plug -stereo plug cable for connecting the VOPEX-C5SVA-x to the audio source. (VOPEX-C5SVA-x only)
- ✓ Line cord, country specific
- ✓ This owner's manual

Additional materials not supplied but are required:
- ➢ CAT5 unshielded twisted-pair cable(s) terminated with RJ45 connectors wired straight thru- pin 1 to pin 1, etc. (see pg. 8 for proper EIA/TIA 568B wiring method)
- ➢ NTI ST-C5SVA-R-600 - CAT5 S-Video/Audio Extender Receiver
          -OR-
- ➢ NTI ST-C5SV-R-600 - CAT5 S-Video Extender Receiver
- ➢ SVEXT-xx-MM (xx= length in feet required) 4-pin miniDIN male-male s-video cable for connecting the VOPEX-C5SVA-x to the video display

Contact your nearest NTI distributor or NTI directly for all of your KVM needs at 800-RGB-TECH (800-742-8324) in US & Canada or 330-562-7070 (Worldwide) or at our website at http://www.nti1.com.

FEATURES AND FUNCTIONS

(Front View)   **(Rear View)**
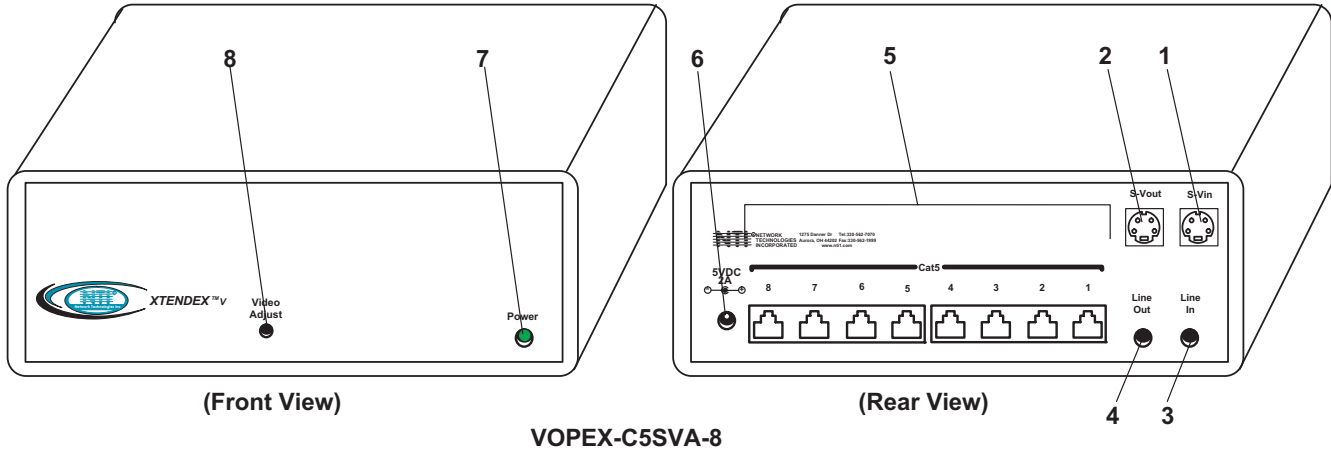
VOPEX-C5SVA-8

Features and Functions

1. S-Video Connector- 4-pin miniDIN female- for connecting the cable from the video source

2. S-Video Connector- 4-pin miniDIN female- for connecting the local user's display

3. Line In- 3.5mm female stereo audio connector- for connecting the cable from the audio source (not present in VOPEX-C5SV)

4. Line Out- 3.5mm female stereo audio connector- for connecting the local self-powered stereo speakers (not present in VOPEX-C5SV)

5. Cat 5- RJ45 female- for connecting CAT5 cables from ST-C5SVA-R-600 Receivers

6. 5VDC- 2.0A- connection jack for the AC adapter

7. Power- Green LED- illuminates when power has been supplied to the VOPEX-C5SVA-x

8. Video Adjust- forces the VOPEX-C5SVA-x to re-adjust the video on all channels (not present in VOPEX-C5SV)

9. S-Video Connector- 4-pin miniDIN female- for connecting the remote user's monitor

10. Cat 5- RJ45 female- for connecting CAT5 cable from the VOPEX-C5SVA-x

11. Green LED- communication indicator- blinks when there is valid communication between the VOPEX-C5SVA-x and the ST-C5SVA-R-600 Receiver.

12. Yellow LED- power indicator- illuminates when power has been supplied to the unit

13. Audio Connector- 3.5mm female stereo audio connector- for connecting the remote speakers

14. 9VDC- 1.0A- connection jack for the AC adapter

(Front View)   **(Rear View)**
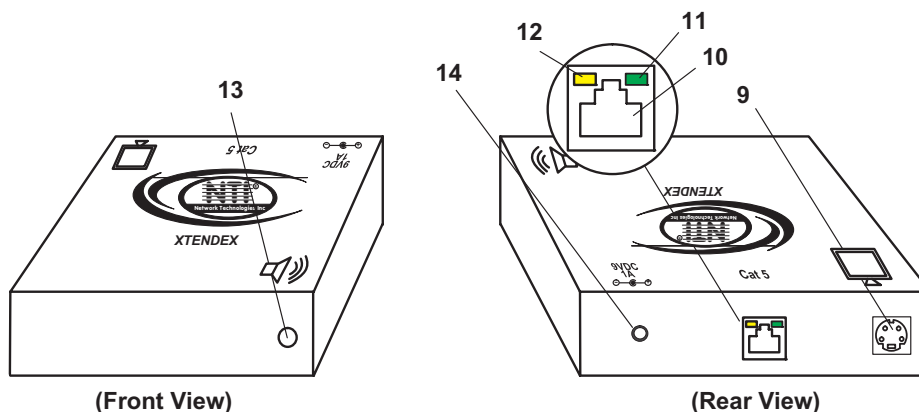
ST-C5SVA-R-600 Receiver

Limitations

- The audio input of the VOPEX-C5SVA-x S-Video/Audio Splitter/Extender is compatible with the following standard CPU audio outputs:

  - Line out - typically lime green in color
  - Speaker out- typically orange in color
  - Headphone out- typically located on the CD-ROM

- The audio outputs of the VOPEX-C5SVA-x Video/Audio Splitter/Extender and the ST-C5SVA-R-600 Receiver are compatible with self-powered stereo speakers.

Preparation for Installation

- Locations should be chosen for the displays and speakers that also have space to connect the VOPEX-C5SVA-x and ST-C5SVA-R-600 Receivers within the distance provided by the cables.   If extension cables are needed, contact NTI for the cables required.

- The CAT5 cables must be run to the locations where the VOPEX-C5SVA-x and ST-C5SVA-R-600 Receivers will be connected.   Be careful to route the cables away from any sources of magnetic fields or electrical interference that might reduce the quality of the video signal (i.e. AC motors, welding equipment, etc.). **NOTE**: If CAT5 cable is already installed in the wall and there are RJ45 wall outlets, it will be necessary to obtain male-to-male straight through connection cables long enough to reach from the wall outlets to the connection locations of the VOPEX-C5SVA-x and ST-C5SVA-R-600 Receivers.

- A properly grounded, polarized, and preferably surge-protected 120V or 240V electrical outlet (depending on the AC adapter being used) must be installed close enough to the connection location of the VOPEX-C5SVA-x and ST-C5SVA-R-600 Receivers, displays, stereo speakers, and A/V sources to plug them into.

- All cables should be installed in such a way that they do not cause stress on their connections to the equipment.   Extended lengths of cable hanging from a connection may interfere with the quality of that connection.   Secure cables as needed to minimize this.

- Properly shut down and disconnect the power from the video source, displays and stereo speakers to be separated.   If other equipment is involved whose connections are being interrupted, be sure to refer to the instruction manuals for that equipment for proper disconnection and re-connection procedures before proceeding.

Installation

VOPEX-C5SVA-x and VOPEX-C5SV-x

Note: VOPEX-C5SV-x S-Video Only Splitter/Extender does not have audio support.   If the audio support is not present, please disregard all audio references.

1. Make connections between the VOPEX-C5SVA-x and the audio and video source(s). (See Fig. 1.)

   a) Connect a 4-pin miniDIN cable end of a SVEXT-6-MM to the VGA connector on the back of the video source.

   b) Connect the other 4-pin miniDIN cable end of the SVEXT-6-MM cable to the 4-pin miniDIN female connector marked "S-Vin" on the VOPEX-C5SVA-x.

   c) Connect one 3.5mm stereo plug end of the SA-6-MM cable into the 3.5mm female audio connector marked "line out", "spkr", or "headphones" on the audio source.

Notes:

If all 3 connectors are available, use the connector marked "line out".

The "line out" connector is typically lime green and may be marked with this symbol

The "spkr" connector is typically orange, and may be marked with this symbol

The "headphones" connector may be marked with this symbol

   d) Connect the other 3.5mm stereo plug end of the SA-6-MM cable into the 3.5mm female stereo audio connector marked "Line In" on the VOPEX-C5SVA-x.
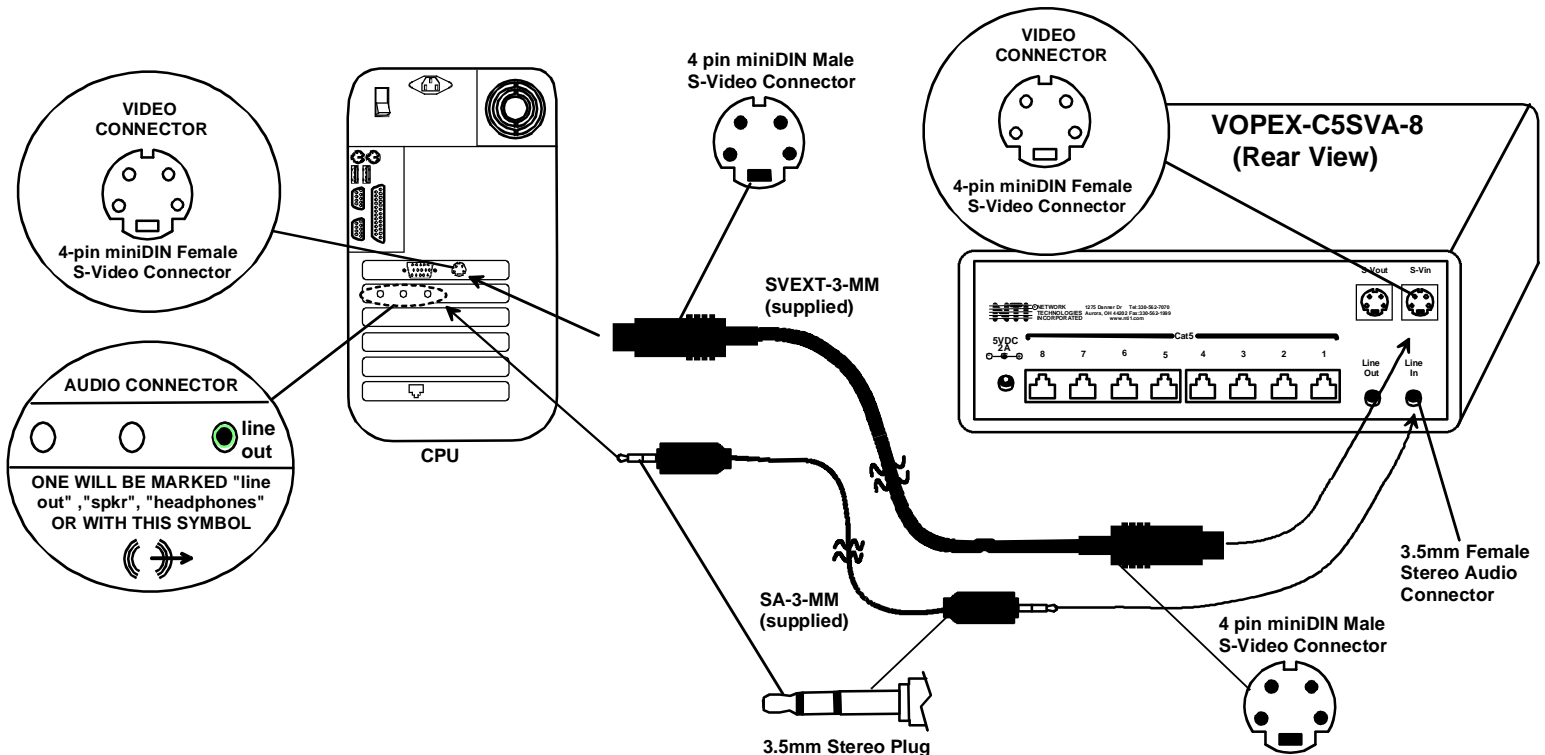

Figure 1- Connecting a VOPEX-C5SVA-8 to a CPU

2. Connect the local user to the VOPEX-C5SVA-x (see Fig. 2)

   a. Connect one end of another SVEXT-xx-MM cable to the 4-pin miniDIN female connector marked "S-Vout" on the VOPEX-C5SVA-x.

   b. Connect the other end of the SVEXT-xx-MM cable to the 4-pin miniDIN female connector on the local s-video display.

   c. Connect the cable from the local speakers into the 3.5mm stereo audio connector marked "Line Out" on the VOPEX-C5SVA-x.
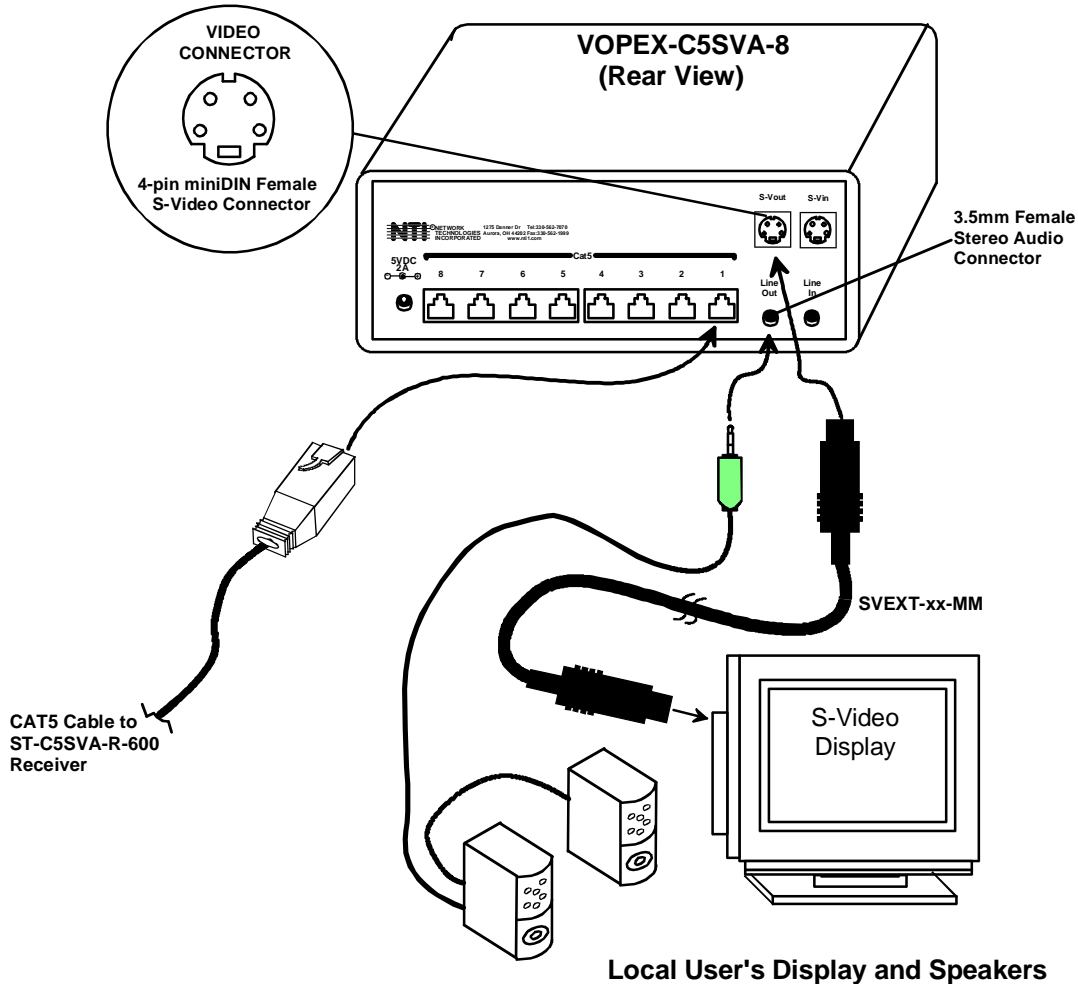
Figure 2- Connect Local User components and CAT5 cable to VOPEX-C5SVA-8

3. Connect a CAT5 cable to any one of the "Cat5x" ports on the VOPEX-C5SVA-x. (See Fig. 2.) When properly inserted the cable end should snap into place.

4. Repeat step 3 for each ST-C5SVA-R-600 Receiver to be connected to the VOPEX-C5SVA-x.

Note: If an RJ45 wall outlet is being used, connect the other end of the extension cable to the RJ45 wall outlet.

⚠ WARNING: Never connect the VOPEX-C5SVA-x Extender/Splitter to an ethernet card, ethernet router, hub or switch or other ethernet RJ45 connector of an ethernet device. Damage to devices connected to the ethernet may result.

ST-C5SVA-R-600 and ST-C5SV-R-600 Receiver

Note: This section is applicable to both models of Receiver except for step 4. When installing ST-C5SV-R-600 Receivers (no audio support), disregard step 4.

1.   Position a ST-C5SVA-R-600 Receiver such that the CAT5 cable, the SVEXT-xx-MM cable, speaker cable, and the AC adapter power connector can each reach the Receiver comfortably.

2.   Connect one end of another SVEXT-xx-MM cable to the female 4-pin miniDIN video connector on the Receiver.

3.   Connect the other end of the SVEXT-xx-MM to the female s-video connector of the remote s-video display.

4.   Connect the remote user's speakers to the 3.5mm female stereo connector on the Receiver (see Fig. 3).
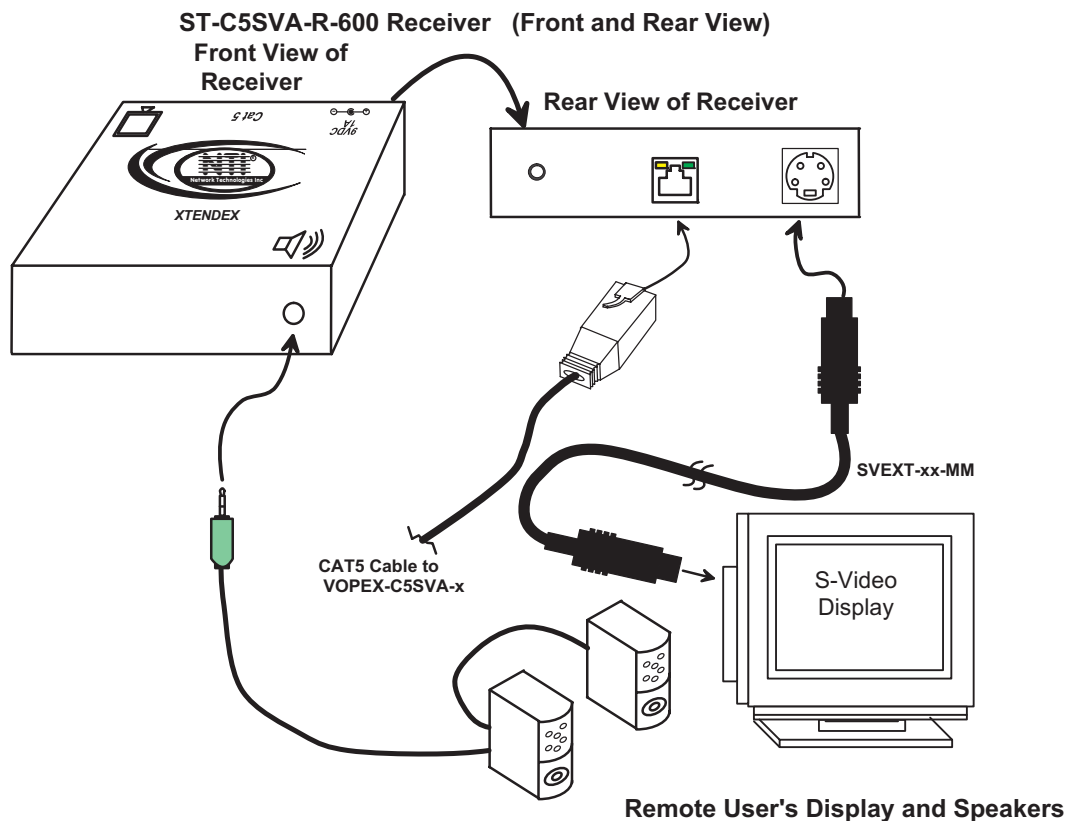
Figure 3- Connect the Extended Components to the ST-C5SVA-R-600 Receiver

5.   Make sure the CAT5 cable has been installed in accordance with the "Preparation for Installation" instructions on page 3. Connect the CAT5 cable to the "Cat 5" port on the Receiver. (See Fig. 3.) When properly inserted the CAT5 cable end should snap into place.

Note: If an RJ45 wall outlet is being used, connect the other end of the extension cable to the RJ45 wall outlet.

6.   Repeat steps 1-4 for each ST-C5SVA-R-600 Receiver to be connected to the VOPEX-C5SVA-x.

⚠️   *WARNING: Never connect the ST-C5SVA-R-600 Receiver to an ethernet card, ethernet router, hub or switch or other ethernet RJ45 connector of an ethernet device.   Damage to devices connected to the ethernet may result.*

Plug-in and Power up

1. Plug the power cord from each monitor and the power supply for each set of stereo speakers into a power outlet.

2. Connect the **5VDC** AC adapter power connector to the 5VDC port on the VOPEX-C5SVA-x.   Make sure the power connector goes into the port all the way.

3. Connect the **9VDC** AC adapter power connector to the 9VDC port on each Receiver.   Make sure each power connector goes into each port all the way.

⚠️ *WARNING: The AC adapter for the Receiver is 9VDC.   Be sure to plug the 9VDC AC adapter into the Receiver, NOT into the VOPEX-C5SV-x !*

Plug each AC adapter into a power outlet.   The green LED on the VOPEX-C5SVA-x and the yellow LED on the RJ45 connector of each ST-C5SVA-R-600 Receiver should illuminate, indicating that a proper power connection has been made to them.   (See Fig. 4.)

9 VDC ADAPTER

Rear View of Receiver

Yellow Power LED

Green Communication LED

Barrel

Power Connector
9VDC @ 1.0A OUTPUT
(Outside barrel) − + (Inside barrel)
2.1 mm x 5.5 mm Female

Figure 4- Connect an AC adapter to a Receiver
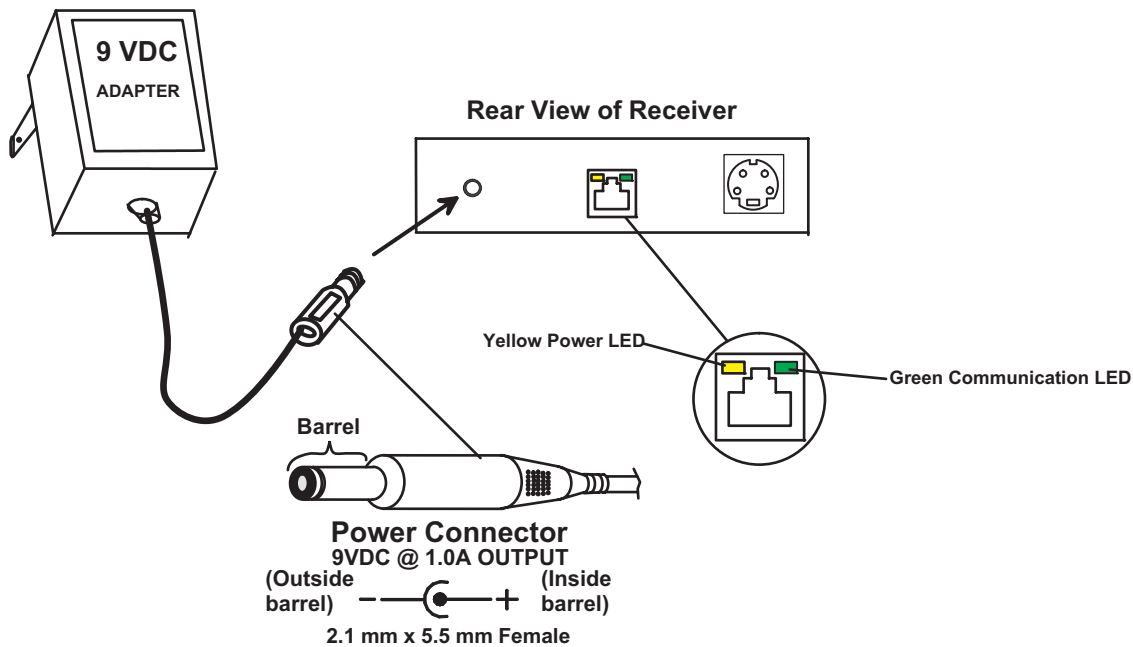
4. Turn ON the audio and video source(s), stereo speakers, and displays.   They should react as if they were directly connected to each other.

Note: The green LED on the RJ45 connector of each ST-C5SVA-R-600 will blink anytime data traffic is passing between the VOPEX-C5SVA-x and the Receivers, indicating proper CAT5 cable connection and communication. (See Fig. 4)

Video Quality

Video Quality Adjustment for VOPEX-C5SVA-x

When powering ON the VOPEX-C5SVA-x, video quality adjustment is done automatically to assure the image is as clear as possible. Once the VOPEX-C5SVA-x is up and running, the video quality can be re-adjusted at any time by pressing the recessed 'Video Adjustment' button. (See Fig 5).   Using the tip of a pen or pencil, a momentary press of the button will force the system to automatically re-adjust the video quality.

Note: Video quality adjustment of the VOPEX-C5SV-x is performed manually at the Receiver. See "Video Quality Adjustment for VOPEX-C5SV-x" below.
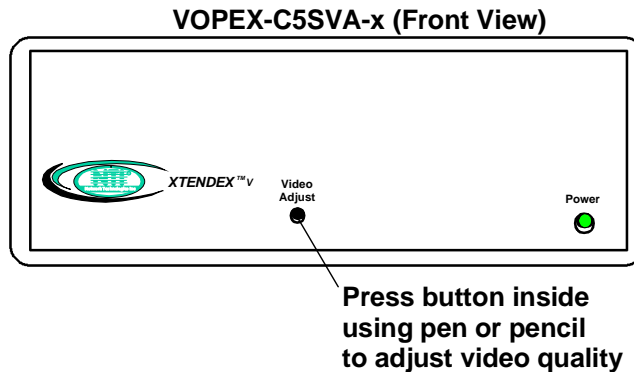
VOPEX-C5SVA-x (Front View)

XTENDEX ™ V   Video Adjust   Power

Press button inside using pen or pencil to adjust video quality

Figure 5- Video Adjust button for manual video quality adjustment

Video quality may need to be re-adjusted if any of the following situations occur:
- A CAT5 cable is replaced, for any reason
- A new ST-C5SVA-R-600 Receiver is connected to the system
- CAT5 cable becomes disconnected from the VOPEX-C5SVA-x or any of the Receivers

Video Quality Adjustment for VOPEX-C5SV-x

Video quality adjustment of the VOPEX-C5SV-x is performed manually at the Receiver.

It is possible that on initial startup the image on the monitor will not be as crisp as the image normally is. This is due to the frequency characteristics of the CAT5 cable.   It may be necessary to press the "+" or "-" buttons on the Receiver (see Fig. 6) until the image is crisp and clear.   Press the "+" button if the image is not crisp and clear enough.   Press the "-" button if the image has been over-corrected (such that horizontal lines appear to trail or shadow at the edge of an open window).   A momentary press of either button will make a minor change in the image.   If either button is pressed and held, the changes made will be gradual and continuous. Ultimately, the image quality should improve to a satisfactory level.   Once the adjustment is made, it should not be necessary to change it again as the new settings are stored in memory and become the default settings with each startup.

Note: When the cable is longer than 300 feet some colored lines can be seen at the black-to-white transitions. This is a normal behavior and is caused by the different twisting rates of each pair of wires in the CAT5 cable.
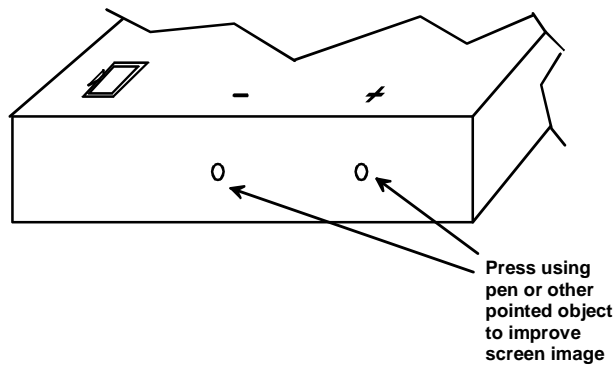
Side view of ST-C5SV-600 Receiver

Press using
pen or other
pointed object
to improve
screen image

Figure 6- Video quality adjustment buttons on ST-C5SV-600 Receiver

Technical Specifications

Maximum Resolution (refresh frequency 60Hz)	800 x 600 - up to 600 feet
Video Compatibility	All s-video displays and sources
Video Quality Adjustment (VOPEX-C5SVA only)	Automatic, for up to 600 feet of CAT5 cable, with manual override (video quality adjustment can only be performed manually at the Receiver for VOPEX-C5SV)
Video Coupling	DC
Video Connectors	4-pin miniDIN female
Video Maximum I/O Levels	1.45Vp-p
Input / Output Impedance	75 Ohms
Audio Connectors	3.5mm female stereo audio connectors
Signal Type	Line Level, stereo, unbalanced
Audio Frequency Response	20Hz to 20Khz, $\pm$ 1Db
Signal-to-noise ratio	76 dBA
Total Harmonic Distortion and Noise	0.017%
Stereo Crosstalk	-70 dB
Audio Maximum I/O Levels	3.1Vp-p
Output Impedance	Max 2K Ohms, unbalanced
THD+N	0.017%,F=20-20KHz, RL=2K Ohm, Vout=1 Vrms
Interconnect Cable	CAT 5/5e Solid UTP EIA/TIA 568B wiring w/ male RJ45 connectors
VOPEX Power	120V or 240V at 50 or 60Hz-5VDC/2.0A via AC Adapter
Receiver Power	120V or 240V at 50 or 60Hz-9VDC/1.0A via AC Adapter
AC Adapter Power Connector	2.1 x 5mm connector, center positive
Operating Temperature Range	+10°C to +40°C
VOPEX-C5SVA-x Size (In.) WxDxH	8x6.3x2.5
ST-C5SVA-R-600 Receiver Size (In.) WxDxH	3.25x3.4x1

Interconnection Cable Wiring Method

The connection cable between the VOPEX-C5SVA-x and each ST-C5SVA-R-600 Receiver is terminated with RJ45 connectors and must be wired according to the EIA/TIA 568B industry standard.   Wiring is as per the table and drawing below.

Pin	Wire Color	Pair	Function
1	White/Orange	2	T
2	Orange	2	R
3	White/Green	3	T
4	Blue	1	R
5	White/Blue	1	T
6	Green	3	R
7	White/Brown	4	T
8	Brown	4	R

Pair 3

Pair 2   **Pair 1**   **Pair 4**

```
| | | | | | | |
T  R  T  R  T  R  T  R
| | | | | | | |
1  2  3  4  5  6  7  8
+  -  +  -  +  -  +  -
```
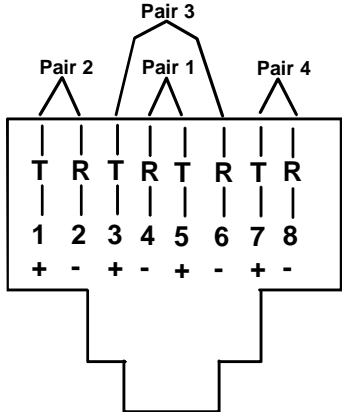
Figure 7- View looking into RJ45 female

Troubleshooting

Each and every piece of every product produced by Network Technologies Inc is 100% tested to exacting specifications.   We make every effort to insure trouble-free installation and operation of our products. If problems are experienced while installing this product, please look over the troubleshooting chart below to see if perhaps we can answer any questions that arise.   If the answer is not found in the chart, please check the FAQs (Frequently Asked Questions) at our website at http://www.nti1.com or contact us directly for help at 1-800-742-8324 (800-RGB-TECH) in US & Canada or 1-330-562-7070 worldwide.   We will be happy to assist in any way we can.

Problem	Cause	Solution
VOPEX-C5SVA-x or ST-C5SVA-R-600 power LED does not illuminate	• A power supply is not connected or plugged-in.	• Make sure each outlet is live and the AC adapters are plugged-in. (one for each Remote and one for the VOPEX-C5SVA-x) • Make sure power connectors are fully connected to their ports.(pg 7)
No video on display	• One or more video cables is loose or disconnected. • No power to the VOPEX-C5SVA-x or the ST-C5SVA-R-600 Receiver. • Video Cable was not attached when CPU was booted. • CAT5 cable is not connected.	• Check all video cable connections • Make sure power LEDs are illuminated for local and remote. If not, see solution for problem above. • With all the cables properly connected, reboot the CPU. • Check cable connections. Make sure they are snapped-in properly and completely and reboot.

Problem	Cause	Solution
Video picture is not sharp or is smeared	• All Video Cables are not firmly seated. • CAT5 cable is too long. • The CAT5 cable is not properly connected. • A cabling change has been made while the system was powered. • A new receiver was connected while the system was powered • Video was not manually adjusted	• Check all connections. Make sure all cables are fully seated. • Verify length is within specified limits-600'. • Check cable connections. Make sure they are snapped-in properly and completely. • Press the "Video Adjust" button. (See "Video Quality" on page 8.) • Press the "Video Adjust" button. (See "Video Quality" on page 8.) • Adjust video at the receiver (see "Video Quality" on page 8)
The picture on the monitor is black and white, rather than color	The video cable was not attached to the CPU when it was booted.	With the cables all properly connected, reboot the CPU.
A constant vertical wobble appears down the screen	CAT5 cable is too close to a strong power source.	Reroute CAT5 cable if possible.
Display sometimes loses sync, causing it to go blank for a second or two	• Electrical power system is very noisy, particularly the ground. • The CAT5 cable is not properly connected.	• Make sure the interconnection cable is not near any power lines. • Check cable connections. Make sure they are snapped-in properly and completely.
No audio	• Audio cable is not properly plugged in • Speakers are not plugged in • CAT5 cable is not properly connected	• Check all cable connections • Verify speakers are powered (if applicable) • Check CAT5 cable connections

☐ **VOPEX-C5SVA-4**　　☐ **VOPEX-C5SV-4**　　**SERIAL NO:** _____

☐ **VOPEX-C5SVA-8**　　☐ **VOPEX-C5SV-8**　　**DATE:** _____

☐ **VOPEX-C5SVA-16**　☐ **VOPEX-C5SV-16**　**INSPECTED BY:** _____

☐ **ST-C5SVA-R-600 Receiver**　☐ **ST-C5SV-R-600 Receiver**

Receiver Serial Nos:

_____　　_____　　_____　　_____

_____　　_____　　_____　　_____

_____　　_____　　_____　　_____

_____　　_____　　_____　　_____

Manual 054 Rev. 12/03/03