XTENDEX® Series

600 FOOT EXTENDERS
Installation and Operation Manual

**ST-C5KVM-600
PS/2 KVM Extender**

**ST-C5KVM-600M
PS/2 KVM Extender**

**VMCTINT-3-MM
(sold separately)**

Man014 Rev. 6/26/09

Note: <u>Shielded</u> CAT 5,5e, or 6 cable must be used to connect to LOCAL and REMOTE units in order to meet CE emission and immunity requirements.

Note: CAT5 connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products should not be run underground, outdoors or between buildings.

WARNING: Outdoor or underground runs of CAT5 cable could be dangerous and will void the warranty.

CE Statement

We, Network Technologies Inc, declare under our sole responsibility that the ST-C5KVM-600(M), STC5KVMRS-600(M), STC5VMA-600(M), ST-C5V-600(M), STC5VRS-600(M), ST-C5VA-600(M), ST-C5SV-600, and ST-C5SVA-600 is in conformity with European Standard EN55022.

Federal Communications Commission Radio Frequency Interference Statement

 This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference and
(2) this device must accept any interference received, including interference that might cause undesired operation.

This device complies with Part 15 of the FCC rules. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Warning: This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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INTRODUCTION

The XTENDEX Series CAT5 Extender (XTENDEX) is designed to enable one CPU to be controlled by two users, one local and one remote.   The remote user can be located as much as 600 feet away from a PS/2 CPU via Category 5 unshielded twisted-pair cable. The local user will be located near the CPU.

Option:
Rackmount Modules- The XTENDEX Series CAT5 Extenders can be ordered as rackmount modules (Remote and/or Local Units)- add "M" to the model number (i.e. ST-C5KVM-600**M**).   When ordering rackmount modules, also order the ST-C5RCK-12 Rackmount Extender Module Tray (see page 16).

The XTENDEX Series Extender is extremely simple to install and has been thoroughly tested to insure reliable performance. Through the use of Category 5 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 computer peripherals (monitor, keyboard, and mouse) in a location where only these parts are needed without having the CPU there too, taking up valuable space

- Allows a PS/2 CPU to be accessed by both a local and remote user (up to 600 feet away)

- Compatible with XGA, VGA, and SVGA systems

- Provides crisp and clear resolution up to 1024 x 768 @ 600 feet (see page 21 for more details)

- Compatible with all NTI switches and splitters, enabling the joining of products to create a system that satisfies all networking needs

- Video quality adjustment, for varying lengths of cable, is automatic (most models, see below and page 20) providing optimum image quality

- Audio frequency response is 20Hz to 20Khz, $\pm$ 1Db (models with audio support only)

- Digital transmission of audio signals reduces any loss in quality (models with audio support only)

This manual covers each of the XTENDEX Series CAT5-600 Extender models offered. Some features described in this manual are available in some models and not in others. The chart below shows the features supported in each:

Model	Video	Keyboard Mouse Support	Audio Support	RS232 Support	Video Quality Adjustment
ST-C5KVM-600	VGA	Yes	No	No	Automatic
ST-C5KVMA-600	VGA	Yes	Yes	No	Automatic
ST-C5KVMRS-600	VGA	Yes	No	Yes	Automatic
ST-C5V-600	VGA	No	No	No	Manual
ST-C5VA-600	VGA	No	Yes	No	Automatic
ST-C5VRS-600	VGA	No	No	Yes	Automatic
ST-C5SV-600	S-Video	No	No	No	Manual
ST-C5SVA-600	S-Video	No	Yes (RCA)	No	Automatic
ST-C5KVMRS-600-SCI	VGA	Yes	No	Yes	Manual
ST-C5KM-600	NO	Remote only	No	No	Not Applicable

Note: Rackmount modules are not available with S-Video support

MATERIALS

Materials Included with this kit:

- ✓ NTI XTENDEX Local Unit
- ✓ NTI XTENDEX Remote Unit
- ✓ 2- 120VAC or 240VAC at 50 or 60Hz-9VDC/1.0A AC Adapters (only 1 ST-C5KM-600)
- ✓ CD with a pdf file of this owner's manual

Additional materials may need to be ordered, depending upon the configuration:

- ➢ CAT5/5e/6 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 568 B wiring method)

Note: Underline Shielded CAT 5,5e, or 6 cable must be used to connect to LOCAL and REMOTE units in order to meet CE emission requirements.

- ➢ Cable(s) needed if Local Unit will be located further than 15" from the CPU

Model	Cable(s) needed
ST-C5KVM-600	VKMEXT-xx (xx= 3/6/10/15/25/35/50/75/100 feet)
ST-C5KVMRS-600	VKMEXT-xx and DINT-xx
ST-C5KVMA-600	VKMEXT-xx and SA-xx-MF
ST-C5V-600	VEXT-xx
ST-C5VRS-600	VEXT-xx and DINT-xx
ST-C5VA-600	VEXT-xx and SA-xx-MF
ST-C5SV-600	SVEXT-xx
ST-C5SVA-600	SVEXT-xx and SA-xx-MF
ST-C5KM-600	VVKINT-xx or VVKEXT-xx

Cables Lengths Available

Cable	xx= Length in feet
VKMEXT-xx	3/6/10/15/25/35/50/75/100
VEXT-xx	3/6/10/15/25/35/50/75/100
DINT-xx	6/10/15
SA-xx-MF	6/12/25/50
SVEXT-xx	1/3/6/10/15/25/35/50/75/100
VVKINT-xx	3/6/10/15/25
VVKEXT-xx	35/50/75/100

For Rackmount Modules the following materials are required- not supplied:

Model	Cables needed
ST-C5KVM-600M	VMCTINT-xx-MM and VMCTINT-xx
ST-C5KVMRS-600M	VMRSTINT-xx-MM and VMRSTINT-xx
ST-C5KVMA-600M	VMATINT-xx-MM and VMATINT-xx
ST-C5V-600M	VTINT-xx-MM and VTINT-xx
ST-C5VRS-600M	VRSTINT-xx-MM and VRSTINT-xx
ST-C5VA-600M	VATINT-xx-MM and VATINT-xx

Legend:
xx= 3, 6, 10, 15 or 25 foot length
MM= cables have male connectors on both ends (except for the DB9) and are only used with Local Units

Note: If two users will be connected (one local and one remote), two of the cables without the "MM" (i.e. VMCTINT-xx) will be needed.

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.networktechinc.com and we will be happy to be of assistance.

FEATURES AND FUNCTIONS

(Front View)   **(Rear View)**
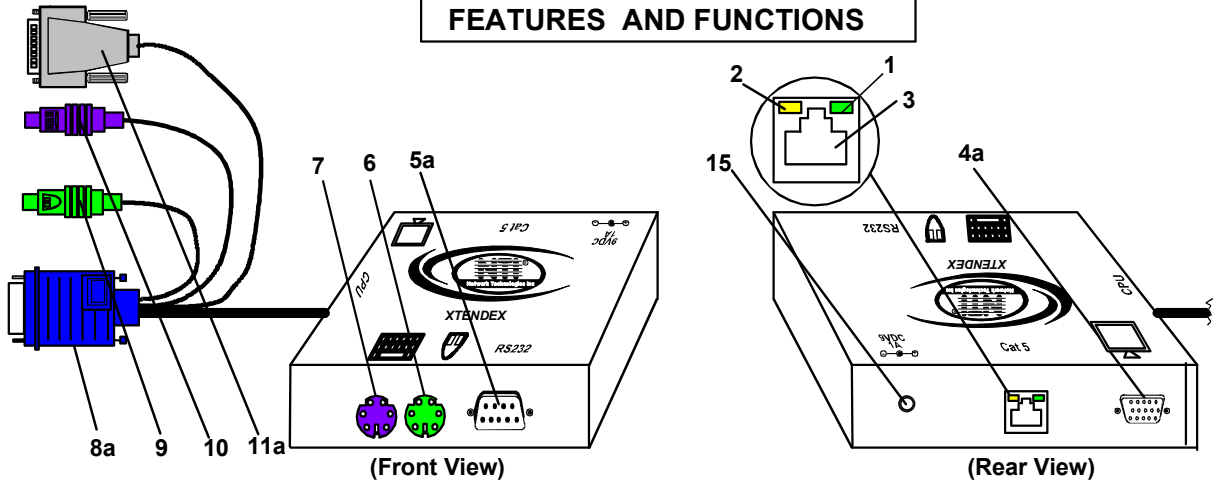
ST-C5KVMRS-600 Local Unit

(Front View)   **(Rear View)**

ST-C5KVMA-600 Local Unit

(Front View)   **(Rear View)**

ST-C5SVA-600 Local Unit

(Front View)   **(Rear View)**
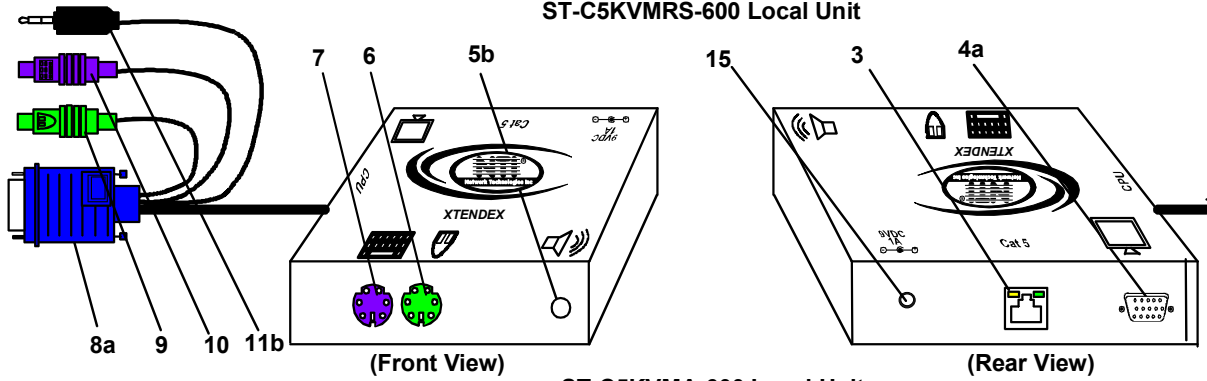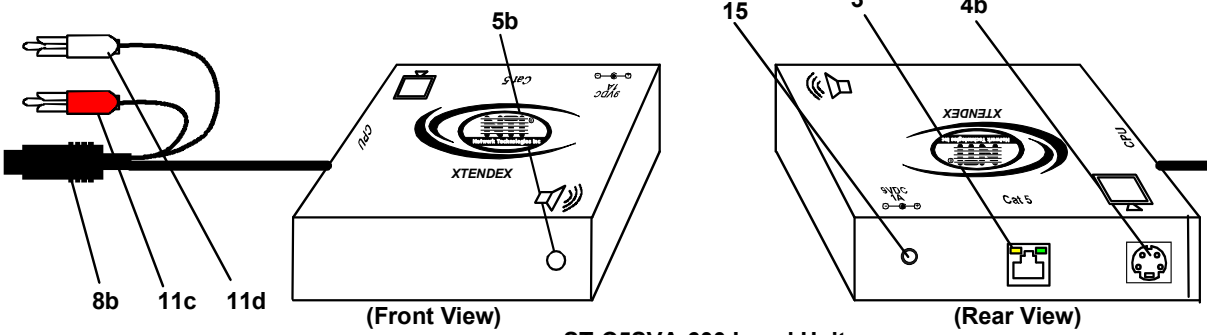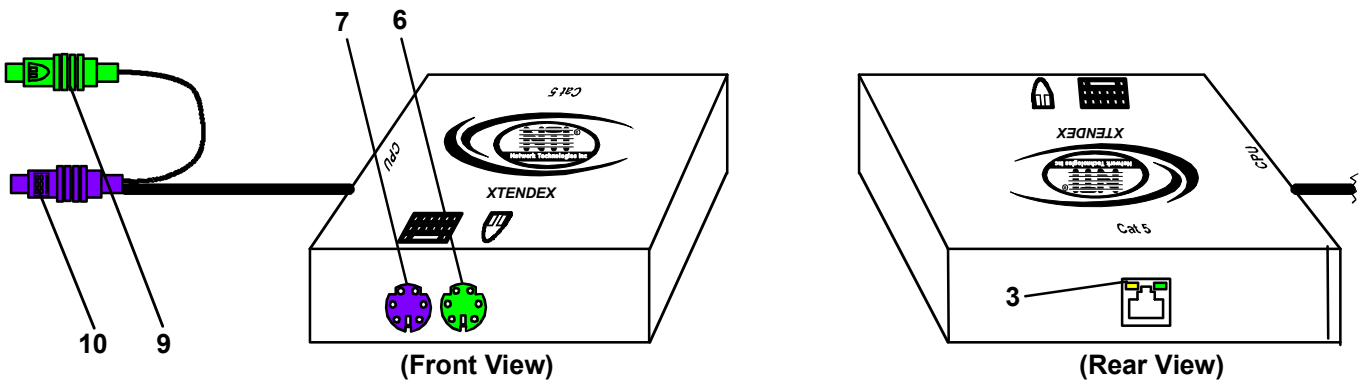
ST-C5KM-600 Local Unit

FEATURES AND FUNCTIONS

1. Green LED- traffic indicator- illuminates when there is communication between the local and remote units.

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

3. Cat 5- RJ45 female- for connecting the CAT 5 cable

4a. Video Connector- 15HD female- for connecting the local user's VGA monitor

4b. S-Video Connector- 4 pin miniDIN female- for connecting the local user's S-video display (S-Video models only)

5a. RS232 Connector- 9D male- for connecting the local user's touchscreen monitor (models with RS232 support only)

5b. Audio Jack- 3.5mm stereo audio jack- for connecting to local speakers (models with audio support only)

6. Mouse Connector- green female 6 miniDIN- for connecting the local user's mouse

7. Keyboard Connector- purple female 6 miniDIN- for connecting the local user's keyboard

8a. Video Connector- blue 15HD male- for connecting to the video port on the CPU or KVM switch

8b. S-Video Connector- black 4 pin miniDIN male- for connecting to the s-video port on the video source (S-Video models only)

9. Mouse Connector- green male 6 miniDIN- for connecting to the mouse port on the CPU or KVM switch

10. Keyboard Connector- purple male 6 miniDIN- for connecting to the keyboard port on the CPU or KVM switch

11a. RS232 Connector- light gray 9D female- for connecting to the RS232 port on the CPU or KVM switch (models with RS232 support only)

11b. Audio Plug- 3.5mm stereo audio plug- for connecting to CPU audio line out (models with audio support only)

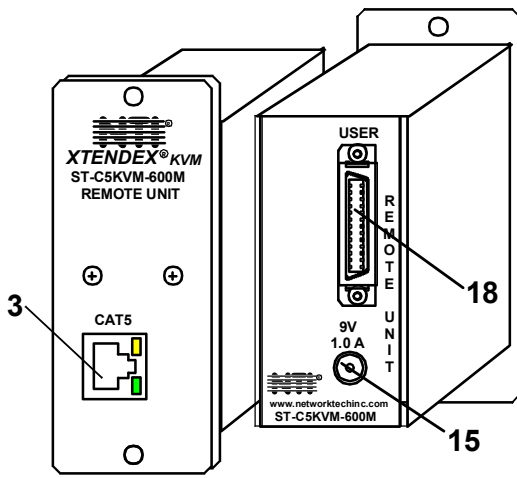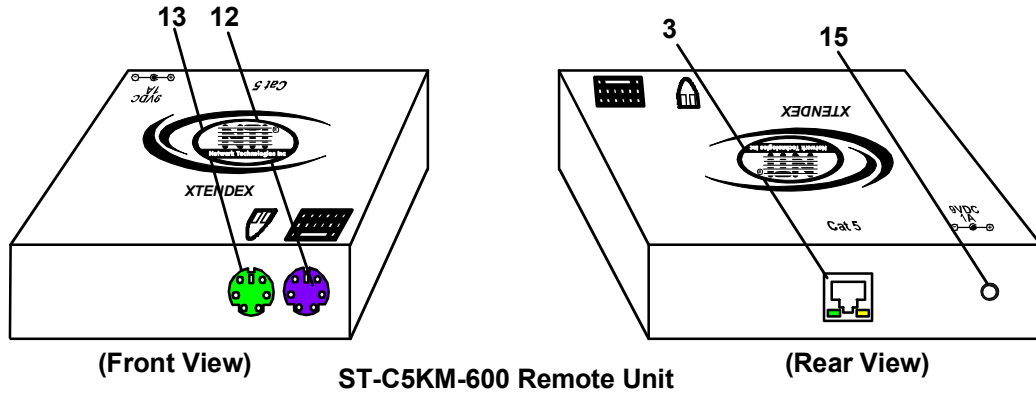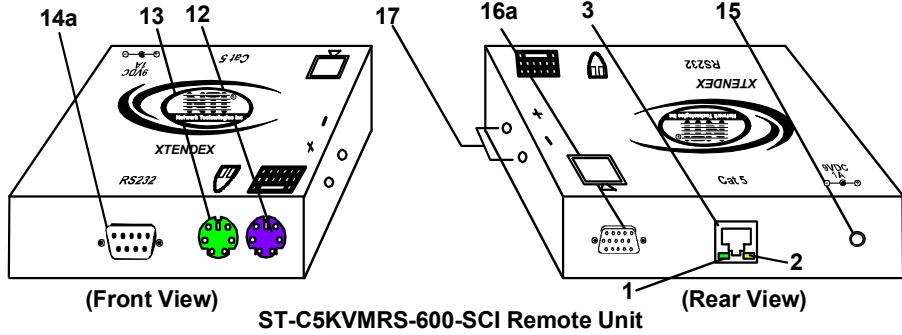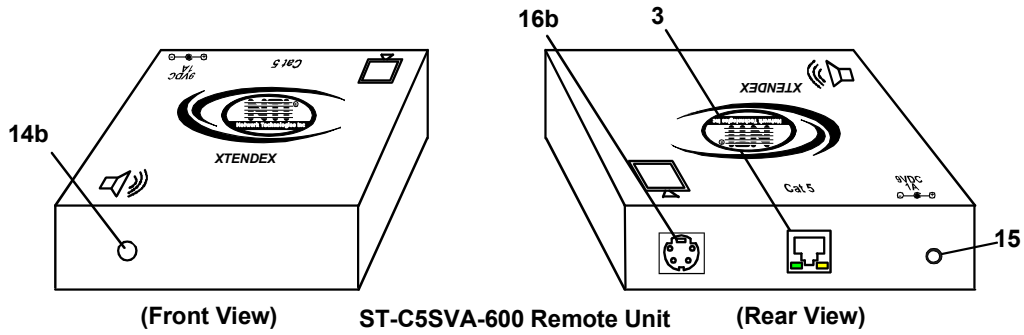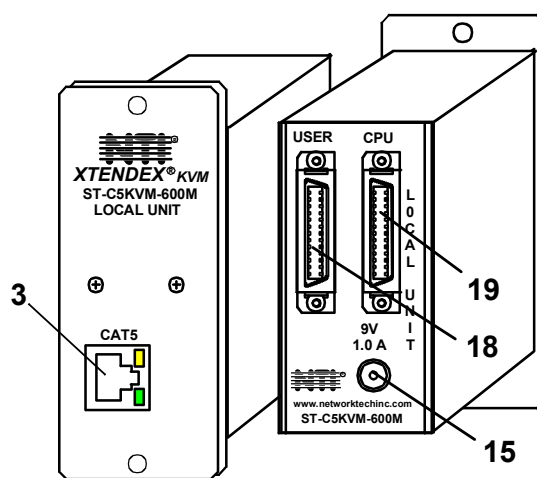11c. Audio Plug- red RCA plug- for connecting to the right channel audio (model ST-C5SVA-600 only)

11d. Audio Plug- white RCA plug- for connecting to the left channel audio (model ST-C5SVA-600 only)

12. Keyboard Connector- purple female 6 miniDIN- for connecting the remote user's keyboard

13. Mouse Connector- green female 6 miniDIN- for connecting the remote user's mouse

14a. RS232 Connector- 9D male- for connecting the remote user's touchscreen monitor (models with RS232 support only)

14b. Audio Jack- 3.5mm stereo audio jack- for connecting to remote speakers (models with audio support only)

15. 9VDC- 1.0A- connection jack for the AC adapter

16a. Video Connector- 15HD female- for connecting the remote user's monitor

16b. S-Video Connector- 4 pin miniDIN female- for connecting the remote user's S-video display (S-Video models only)

17. Buttons- for manually adjusting video quality (models ST-C5V-600, ST-C5SV-600, and ST-C5KVMRS-600-SCI only)

(Front View)   ST-C5KVMA-600 Remote Unit   (Rear View)

(Front View) **ST-C5SVA-600 Remote Unit** (Rear View)

(Front View) **ST-C5KVMRS-600-SCI Remote Unit** (Rear View)

(Front View) **ST-C5KM-600 Remote Unit** (Rear View)
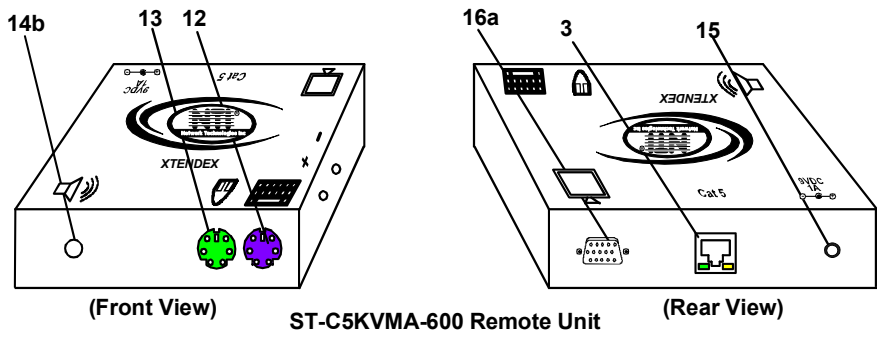
ST-C5KVM-600M
Remote Module
Front and Rear Views

ST-C5KVM-600M
Local Module
Front and Rear Views

(All XTENDEX 600 foot extender modules have the same connections)

18. **USER-** .05 SCSI II Female- for connecting cable between module and the user devices
19. **CPU-** .05 SCSI II Female- for connecting cable between the module and the CPU

LIMITATIONS

- Hot-plugging of devices is supported provided devices were originally connected at power-up.

- In order for two users to share a PS/2 CPU, the user in control must pause for at least 3 seconds before another user can take control.   After the 3 second pause, either user can take control of the CPU.

For models with RS232 support:
- The RS232 ports on the Local and Remote Units will support serial devices other than touchscreen monitors as follows:

    - 2 simple devices (i.e. mice) connected to <u>each</u> unit,   or

    - 1 complex device (i.e. serial modem, RS232 command port on an NTI switch) connected to <u>either</u> the Remote or Local Unit.

- In order for two users to share a PS/2 CPU, the user in control must pause for at least 3 seconds before another user can take control.   After the 3 second pause, either user can take control of the CPU.

- The RS232 port supports all baud rates up to 56K bits per second and the attached CPU must be configured accordingly.

For models with audio support:
- The audio input of the XTENDEX with audio support 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

- To connect the ST-C5SVA-600 to a CPU, it may be necessary to use an RCA phono-to-3.5mm stereo jack adapter

- The audio output of the XTENDEX with audio support is compatible with self-powered stereo speakers.

PREPARATION FOR INSTALLATION

- Locations should be chosen for the monitors, mice, and keyboards that also have space to connect the Remote and Local Units 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 Remote and Local Units 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.).

- 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 CPU and monitors 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.

Note: CAT5 connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products should not be run underground, outdoors or between buildings.

WARNING: Outdoor or underground runs of CAT5 cable could be dangerous and will void the warranty.

INSTALLATION

Installing The Local Unit (models with VGA video connectors)

1. Plug the cables of the Local Unit into the back of the CPU. (See Figure 1.)

a) Connect the blue 15HD cable end to the VGA port on the back of the CPU.

b) Connect the purple 6 pin miniDIN cable end with the keyboard symbol
on it to the keyboard port on the back of the CPU.   (KVM models only)

c) Connect the green 6 pin miniDIN cable end with the mouse symbol
on it to the mouse port on the back of the CPU. (KVM models only)
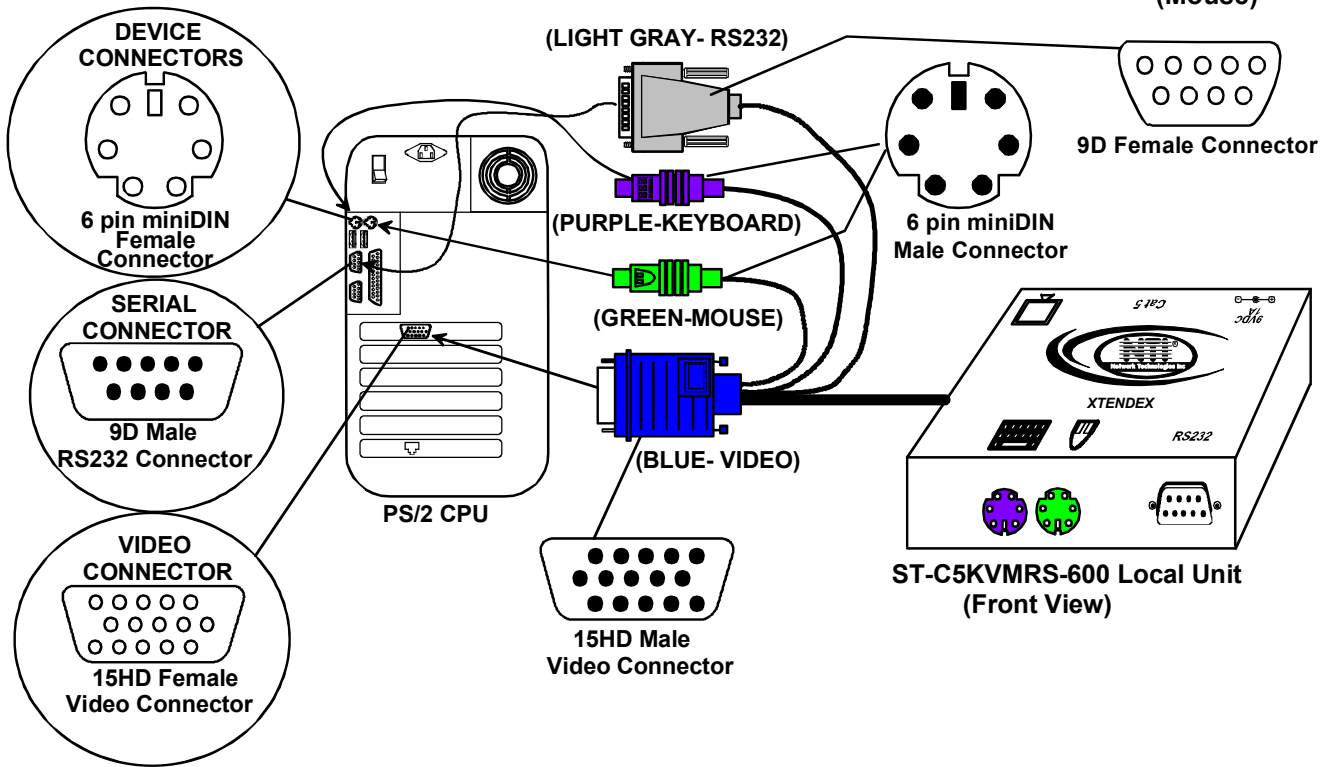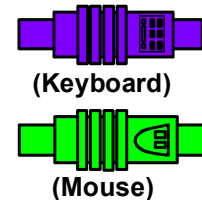
Figure 1- Connect the Local Unit with VGA video and RS232 support to the CPU

d) If the Local Unit has RS232 support, connect the light gray 9D cable end to the RS232 port on
the back of the CPU.

e) If the Local Unit has Audio support, connect the black 3.5mm stereo plug into the "line out",
"spkr", or "headphones" jack on the back of the CPU. (See Figure 2)

Notes:
If all 3 jacks are available, use the jack marked "line out".

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

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

The "headphones" jack may be marked with this symbol
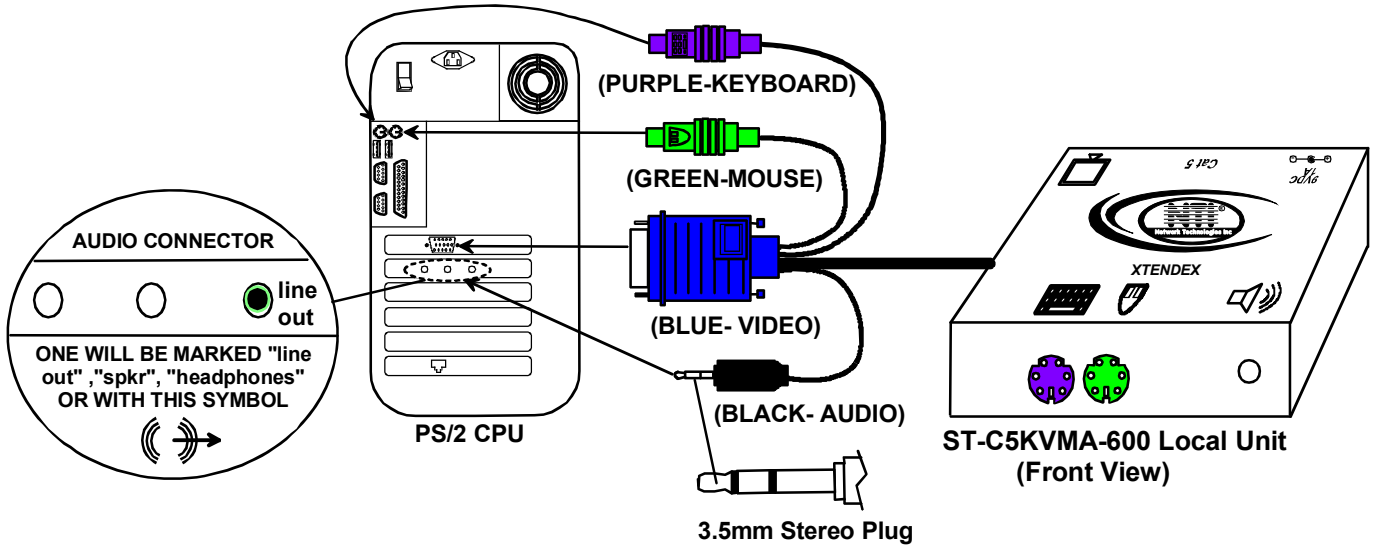
Figure 2- Connect the Local Unit with Audio support to the CPU

2. Make connections for a local user (see Figure 3)

    a) Connect the cable from the local user's VGA monitor to the female 15HD port on the Local Unit.

    b) Connect the local user's keyboard to the purple 6 pin miniDIN female port on the Local Unit.

    c) Connect the local user's mouse to the green 6 pin miniDIN female port on the Local Unit.
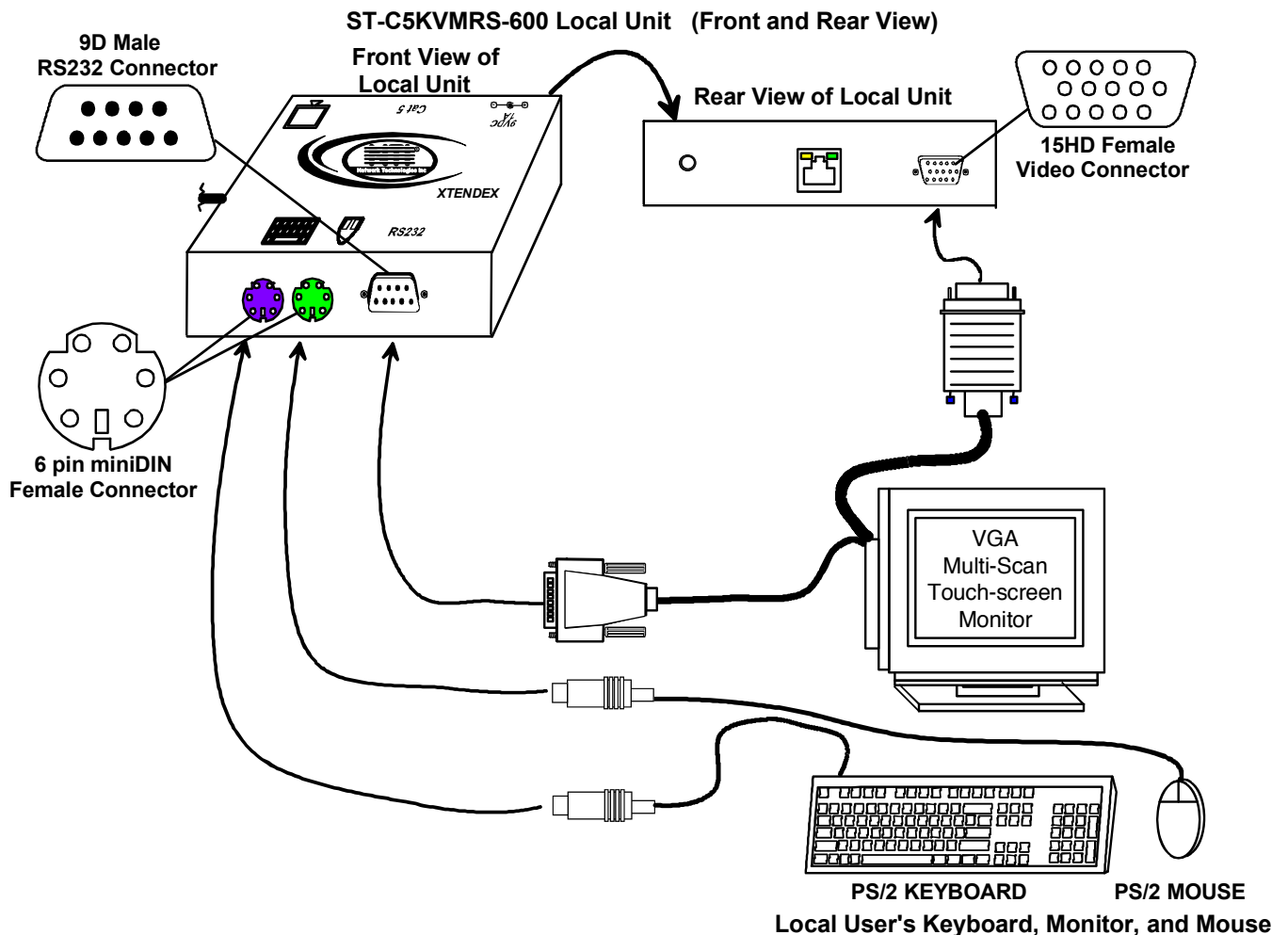
Figure 3- Connect the local user to the XTENDEX Local Unit

d) If the Local Unit has RS232 support, connect the local user's RS232 cable from a touch screen monitor to the 9D male port on the Local Unit.

e) If the Local Unit has audio support, connect the cable from the local speakers to the 3.5mm stereo audio jack on the Local Unit. (See Figure 4)

ST-C5KVMA-600 Local Unit
Front View

3.5mm Stereo Audio Jack
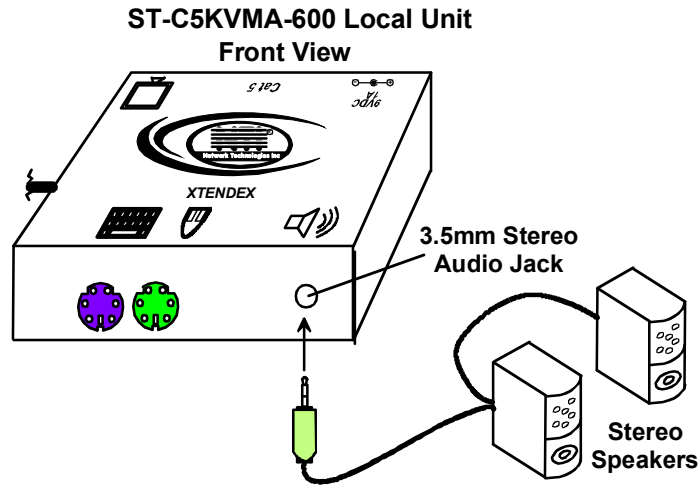
Stereo Speakers

Figure 4- Connect stereo speakers to XTENDEX Local Unit with audio support

Installing The Local Unit (models with S-Video connectors)

1. Plug the cables of the Local Unit into the back of the s-video source. (See Figure 5.)

   a) Connect the 4 pin miniDIN male cable end to the s-video port on the video source.

   b) If the Local Unit has audio support, connect the red RCA plug to the "right" speaker jack on the audio source and connect the white RCA plug to the "left" speaker jack on the audio source.

Note: Refer to the owner's manual of the s-video/audio source to determine how the left and right audio channels are labeled.

4 pin miniDIN Male
S-Video Connector

DVD Player

White RCA Plug Left Channel

Red RCA Plug Right Channel

ST-C5SVA-600 Local Unit
(Front View)
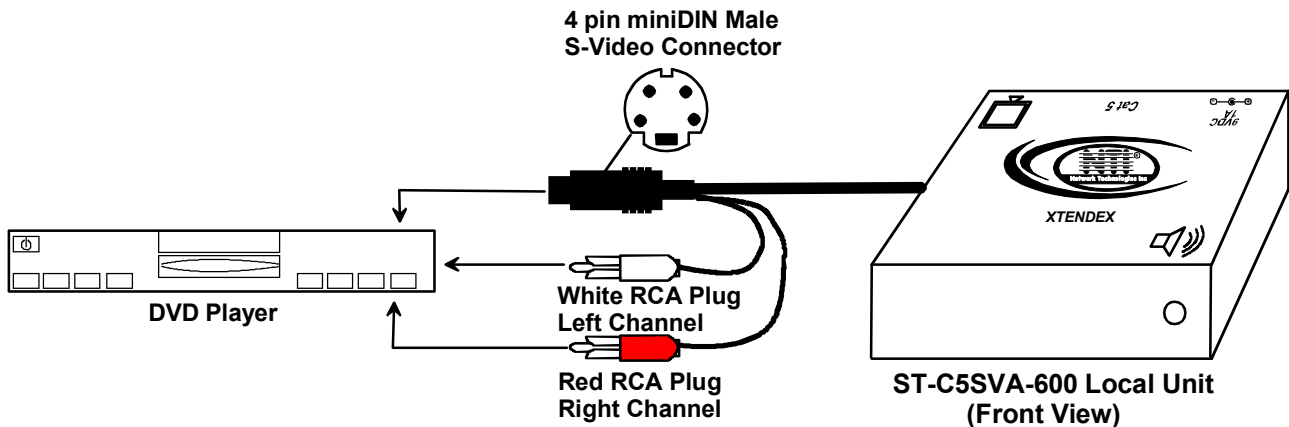
Figure 5- Connect the S-Video Local Unit to the s-video/audio source

2. Make connections for a Local User (see Figure 6)

    a) Connect one end of an SVEXT-xx-MM cable to the s-video port on the display.

    b) Connect the other end of the same SVEXT-xx-MM cable to the s-video port on the Local Unit.

    c) If the Local Unit has audio support, connect the cable from the local speakers into the 3.5mm jack on the local unit.
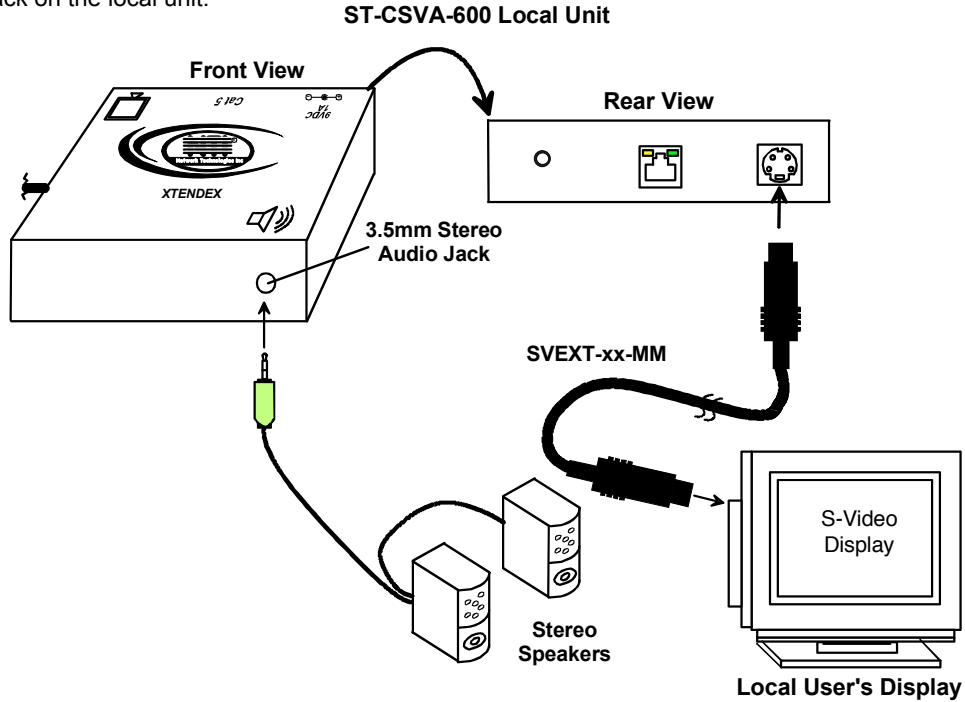
Figure 6- Connect S-Video display and speakers to Local Unit with s-video support

Installing the Local Unit (models with only KM connectors)

1. Plug the cables of the Local Unit into the back of the CPU. (See Figure 7)

    a) Connect the green 6 pin miniDIN cable end with the mouse symbol on it to the mouse port on the back of the CPU.

    b) Connect the purple 6 pin miniDIN cable end with the keyboard symbol on it to the keyboard port on the back of the CPU.
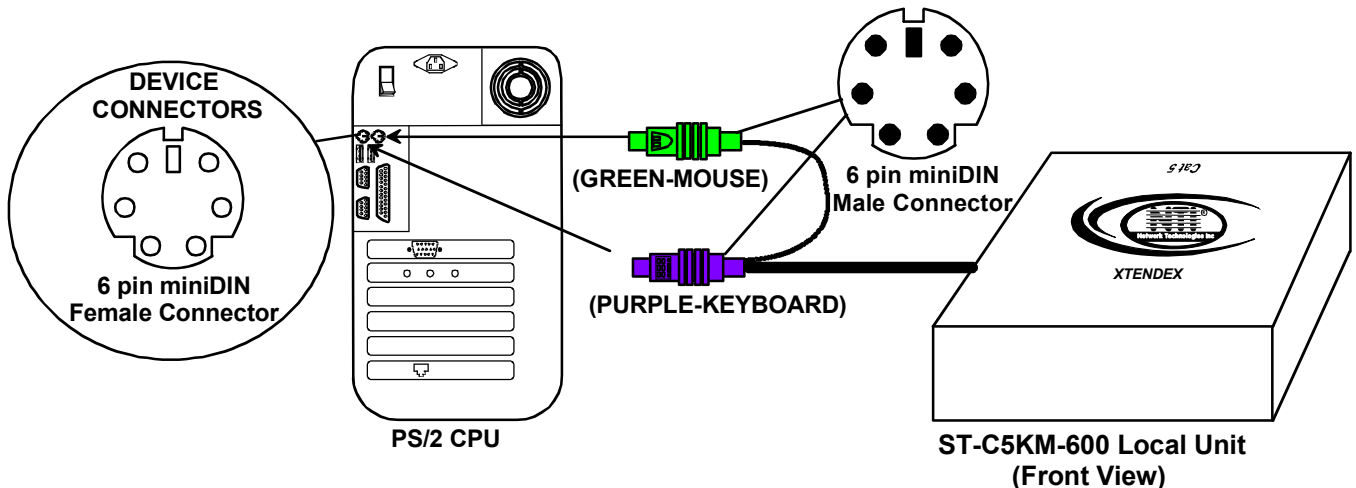
Figure 7- Connect Local Unit with only keyboard and mouse support

Connect The CAT5 Cable

Connect the CAT5 cable to the "Cat 5" port on the Local Unit. (See Figure 8.) When properly inserted the 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.

⚠ WARNING: Never connect the XTENDEX 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.

Rear View of Local Unit

Green Traffic LED
Yellow Power LED

CAT5 Cable to Remote Unit
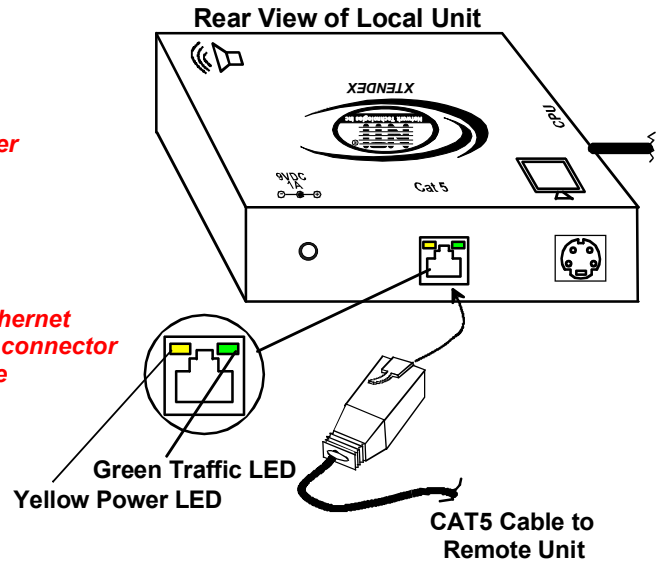
Figure 8- Connect CAT5 cable to Local Unit

Installing The Remote Unit (models with VGA video connectors)

1. Position the Remote Unit such that the CAT5 cable, the monitor cable, device cables, and the AC adapter power connector can each reach the Remote Unit without putting strain on the cables.

2. Connect the monitor cable to the female 15HD video connector on the Remote Unit.

3. Connect the device(s) to the Remote Unit (see Figure 9)(KVM models only).

    a) Connect the keyboard to the purple female 6 pin miniDIN connector on the Remote Unit.

    b) Connect the mouse to the green female 6 pin miniDIN connector on the Remote Unit.

4. If the Remote Unit has RS232 support, connect the remote user's RS232 cable from a touch screen monitor to the 9D male port on the Remote Unit.

5. If the Remote Unit has audio support, connect the cable from the remote speakers to the 3.5mm stereo audio jack on the Remote Unit. (See Figure 9)

ST-C5KVMRS-600 Remote Unit   (Front and Rear View)

9D Male
RS232 Connector

Front View of
Remote Unit

Rear View of Remote Unit

15HD Female
Video Connector

XTENDEX

RS232

6 pin miniDIN
Female Connector

VGA
Multi-Scan
Monitor

PS/2 KEYBOARD   PS/2 MOUSE
Remote User's Keyboard, Monitor, and Mouse
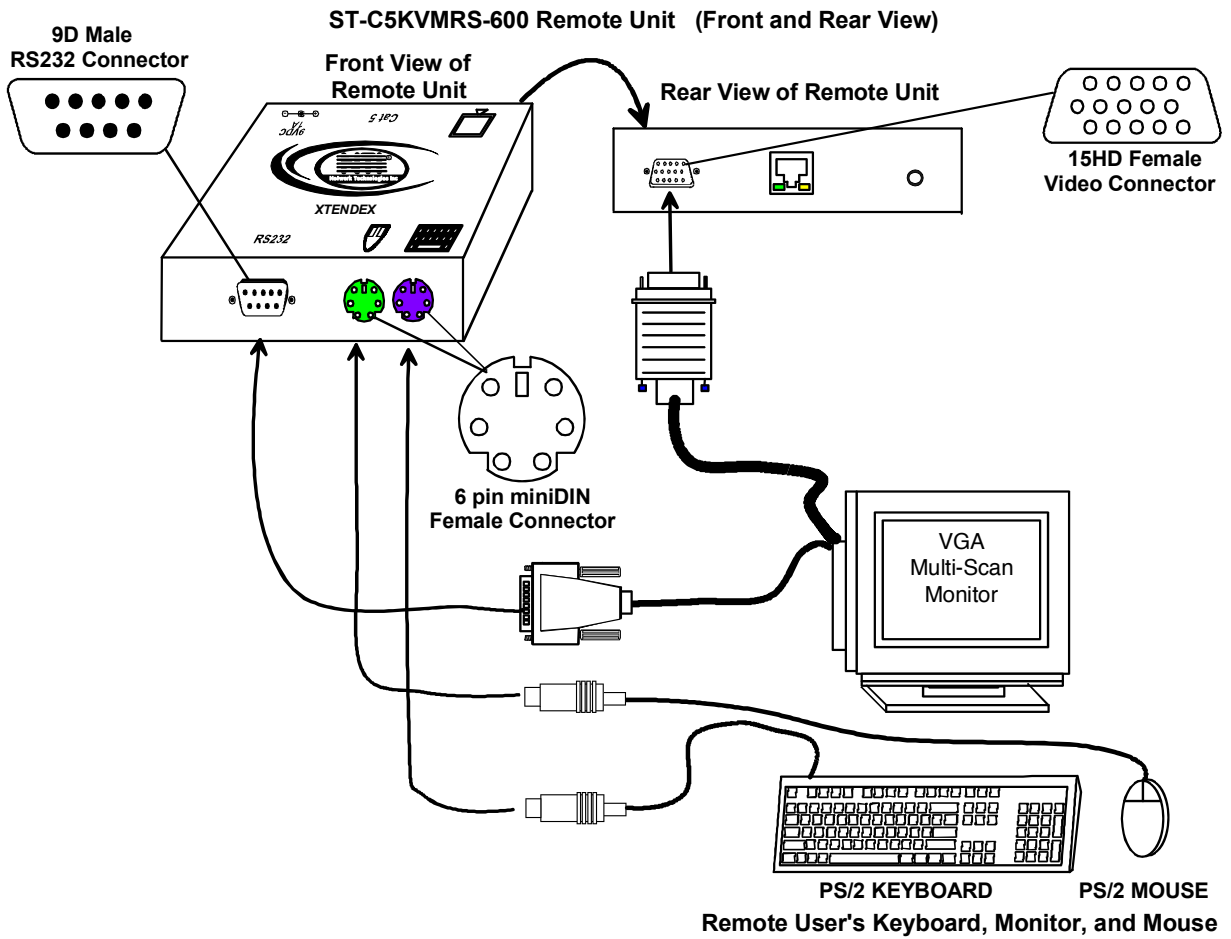
Figure 9- Connect the Extended Components to the Remote Unit

ST-C5KVMA-600 Remote Unit
Front View

XTENDEX

3.5mm Stereo
Audio Jack

Stereo
Speakers
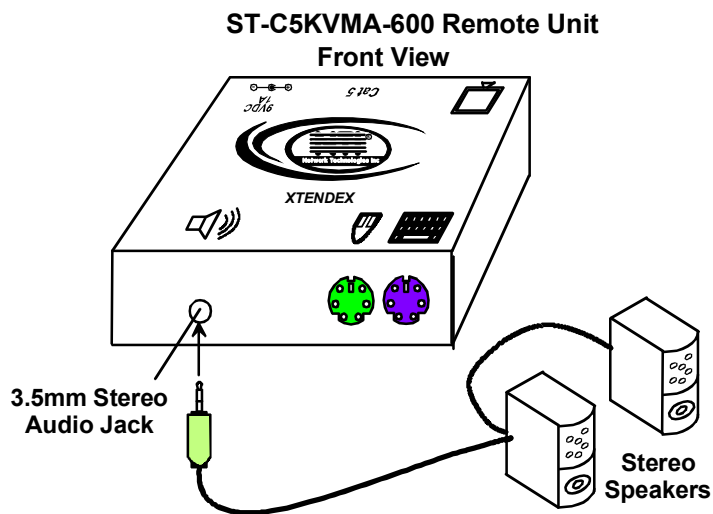
Figure 10- Connect speakers to the Remote Unit

Installing The Remote Unit (models with S-Video connectors)

1. Position the Remote Unit such that the CAT5 cable, the s-video cable, speaker cable, and the AC adapter power connector can each reach the Remote Unit without putting strain on the cables.

2. Connect one 4 pin miniDIN end of another SVEXT-xx-MM cable to the Remote Unit.

3. Connect the other 4 pin miniDIN end of the SVEXT-xx-MM cable to the s-video port on the display.

4. If the Remote Unit has audio support, connect the speakers to the 3.5mm jack on the Remote Unit (see Figure 11).

ST-C5SVA-600 Remote Unit
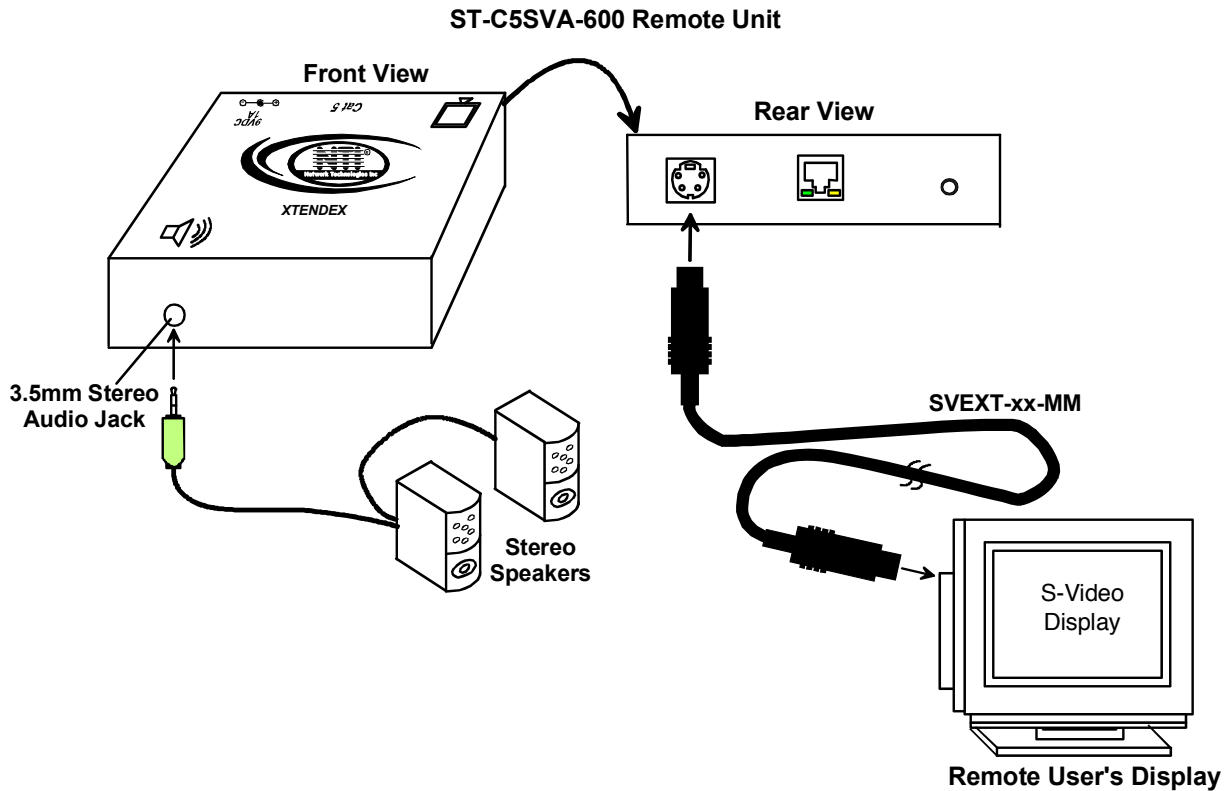
Figure 11- Connect components to an S-Video Remote Unit

Installing The Remote Unit (models with only KM connectors)

1. Position the Remote Unit such that the CAT5 cable, the keyboard cable, mouse cable and power supply cable can each reach the Remote Unit without putting strain on the cables.

2. Connect the keyboard to the purple female 6 pin miniDIN connector on the Remote Unit.

3. Connect the mouse to the green female 6 pin miniDIN connector on the Remote Unit.

ST-C5KM-600 Remote Unit
Front View

6 pin miniDIN
Female Connector

PS/2 MOUSE   **PS/2 KEYBOARD**
Remote User's Keyboard and Mouse
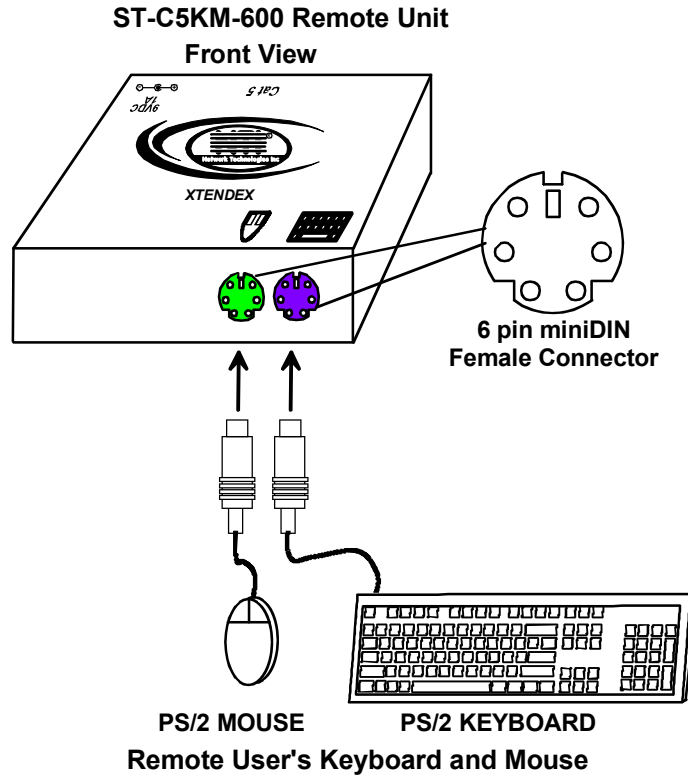
Figure 12- Connect keyboard and mouse to Remote Unit

Connect the CAT5 cable

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 Remote Unit. (See Figure 13.) 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.

Rear View of Remote Unit

⚠ *WARNING: Never connect the XTENDEX 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.*

CAT5 Cable to Local Unit
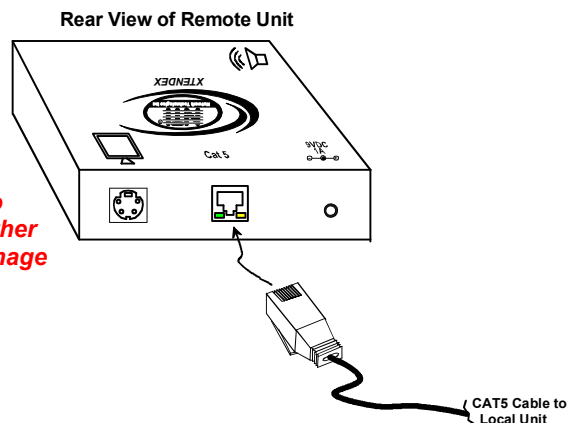
Figure 13- Connect the CAT5 cable to the Remote Unit

Plug-in and Boot Up

1. Plug the power cord from the monitor into the power outlet.

2. Connect each AC adapter power connector to the 9VDC ports on the Remote and Local Units   Plug each AC adapter into a power outlet.   The yellow LED on the RJ45 connector of both the Remote and Local Units should illuminate, indicating that a proper power connection has been made to them.   (See Figure 14.)

Rear View of Remote Unit

Green Traffic LED

Yellow Power LED

Barrel

9 VDC ADAPTER

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

Figure 14- Connect the AC adapter to the Remote Unit

3. Turn ON the CPU and Monitor.   They should each react as if they were directly connected to each other.

Note: The green LED on each RJ45 connector will illuminate anytime data traffic is passing between the Local and Remote Units, indicating proper CAT5 cable connection and communication. (See Figure 14)

Rackmount Modules (optional)

If ST-C5-600M Series XTENDEX rackmount modules (Local and/or Remote modules) are being installed, then an ST-C5RCK-12 Rackmount Extender Module Tray must be used (sold separately) to mount the modules to a RACK.   The ST-C5RCK-12 provides a convenient mounting method for up to 12 Local and /or Remote XTENDEX modules.

Note: Rackmount Local modules are compatible with rackmount Remote modules or desktop Remote units.
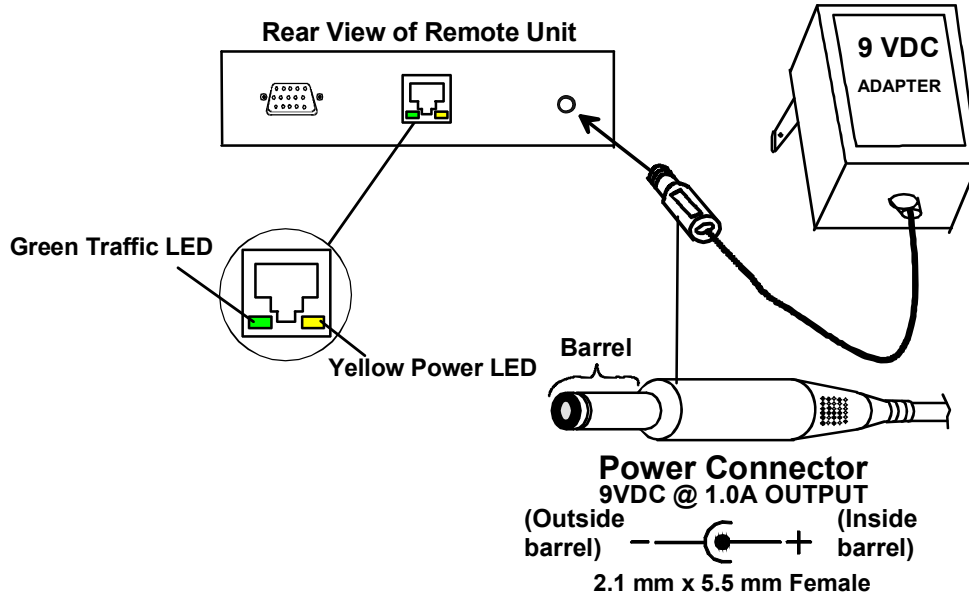
Mount the ST-C5RCK-12 Rackmount Extender Module Tray

1. The ST-C5RCK-12 Rackmount Extender Module Tray was designed to be directly mounted in a rack. It includes a mounting flange to make attachment easy.

2. Install 4 cage nuts (supplied) to the rack in locations that line up with the holes in the mounting flange on the tray. Then secure the tray to the rack using four #10-32 x 3/4" screws (supplied). Be sure to tighten all mounting screws securely.
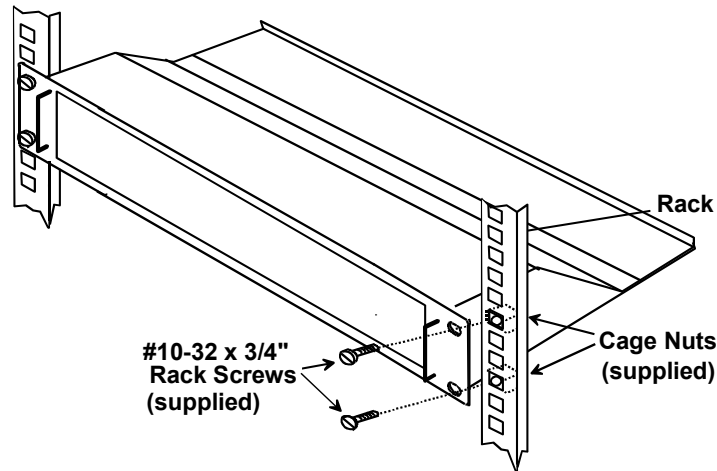
Figure 15- Mount ST-C5RCK-12 Extender Module Tray in a rack

3.   Slide each module into the tray and line up the holes in the mounting plate on the module with corresponding holes in the tray. Secure the module(s) using the two screws provided. Blank plates and screws are provided to cover empty module spaces.

Frontview of ST-C5RCK-12 with XTENDEX Extender Modules

Secure XTENDEX module(s) to the ST-C5RCK-12 using the screws provided.
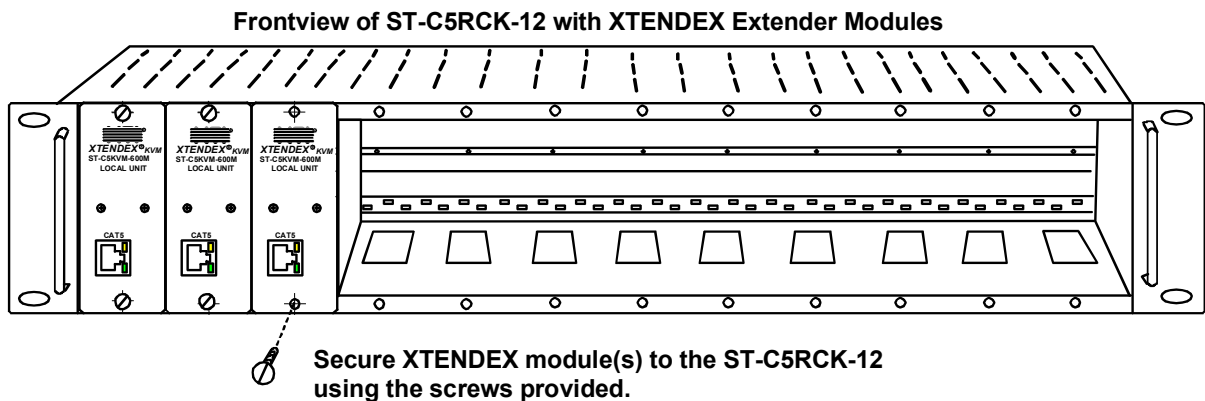
Figure 16- Secure each module to the tray

4. Secure the power supply for each module to the power supply/cable management shelf at the rear of the tray using the bracket and screw supplied.

Rearview of ST-C5RCK-12 with XTENDEX Extender Modules

Plug power connector into Extender module

Power supply/cable managment shelf

Connect power cord to power supply here

Power supply mounting bracket (supplied with each module)

Secure each power supply to the tray using the bracket and screw provided.
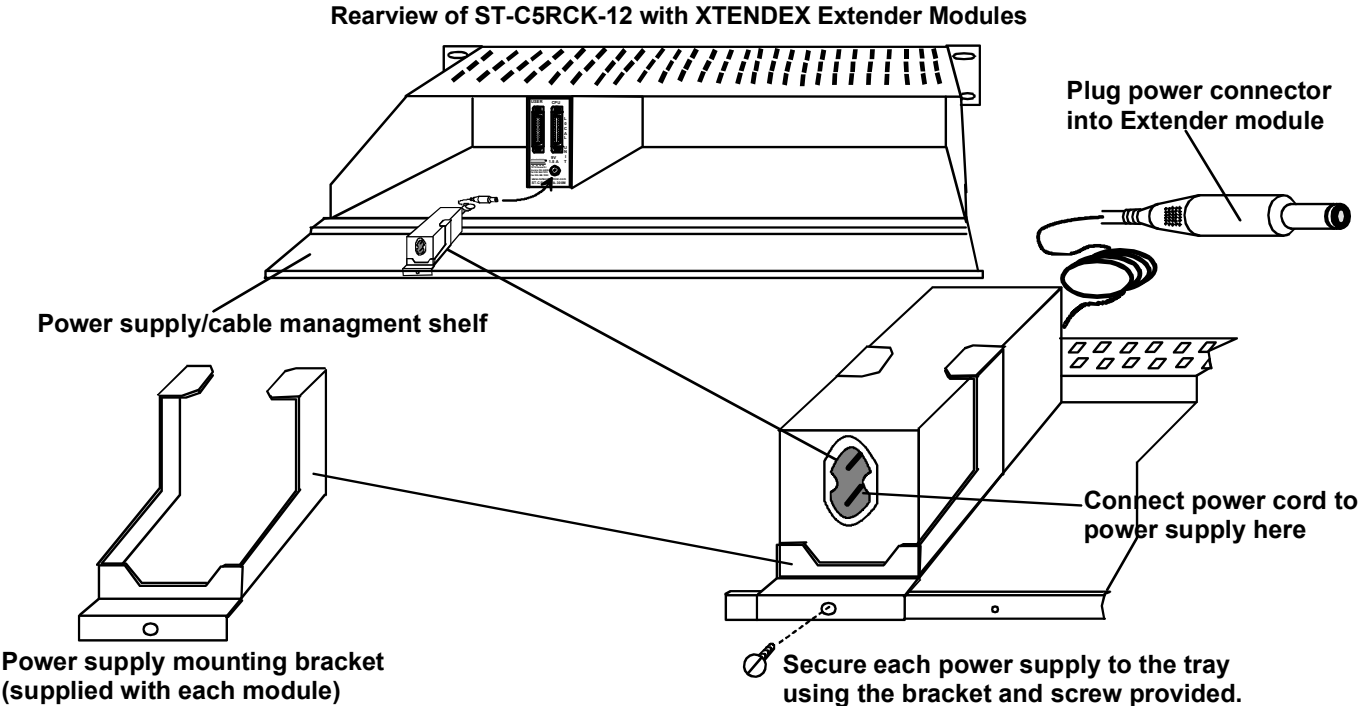
Figure 17- Secure each power supply to the tray

Connect the CPU

Connect a cable between the Local Unit and the CPU.   Use the appropriate cable for the application (see chart below).
Figure 18 shows the proper connections for the ST-C5KVMA-L-600M using a VMATINT-xx-MM cable (xx= 3, 6, 10, 15 or 25 foot length).   Make sure all connections are firmly seated.
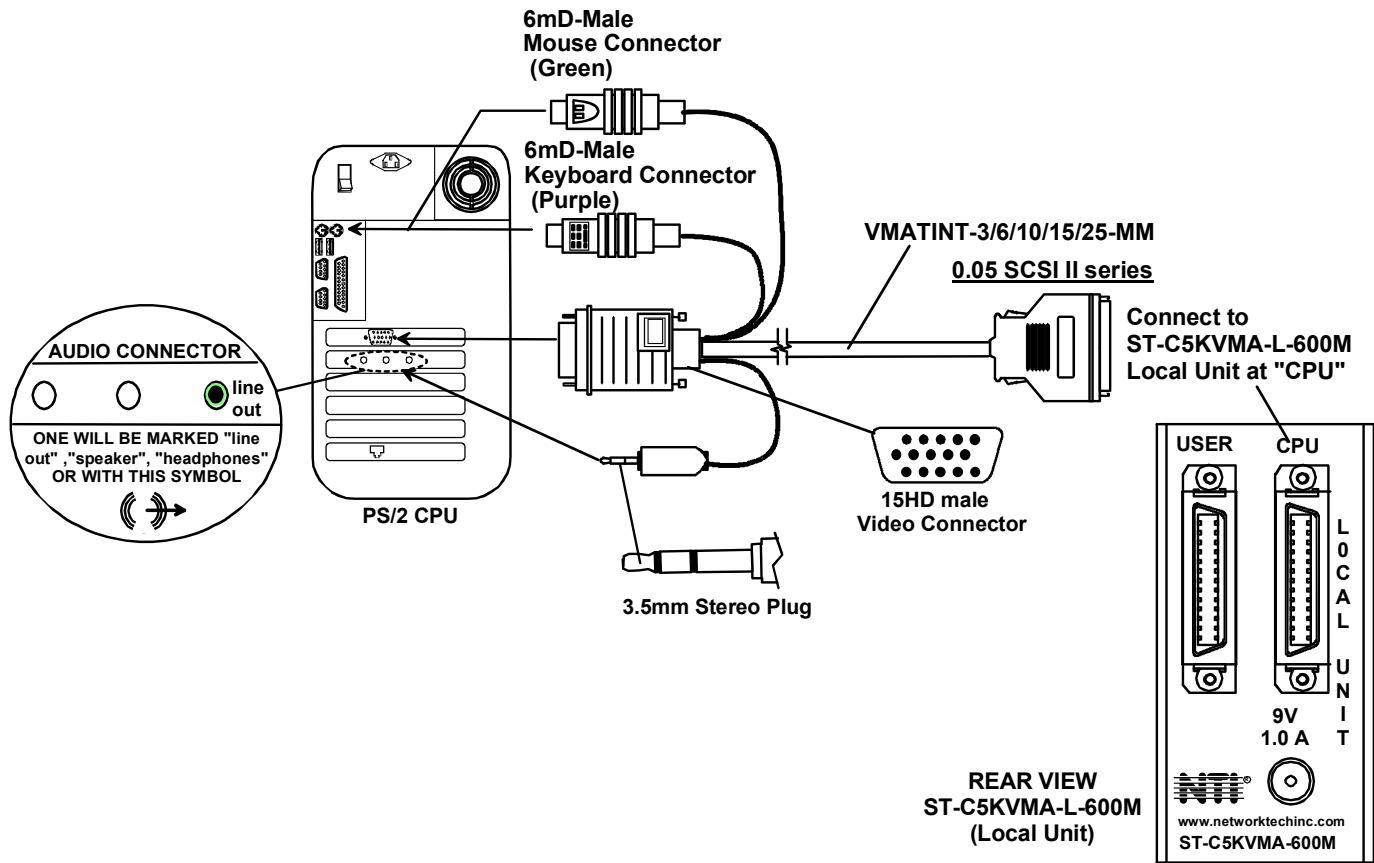
Figure 18- Connect cable between CPU and module

Cables for connecting 600M modules to a CPU

	Features Supported:			
Cable To Use	**Video**	**Keyboard/Mouse**	**Audio**	**RS232**
VMCTINT-xx-MM	Y	Y	N	N
VMATINT-xx-MM	Y	Y	Y	N
VMRSTINT-xx-MM	Y	Y	N	Y
VTINT-xx-MM	Y	N	N	N
VATINT-xx-MM	Y	N	Y	N
VRSTINT-xx-MM	Y	N	N	Y

xx= 3, 6, 10, 15 or 25 foot length

Connect the Devices

Connect a cable to the monitor, keyboard, mouse, speakers (if supported), and touch screen RS232 cable (if supported) and then to the Local or Remote Unit at the connector marked "USER". Figure 19 shows the proper connections for the ST-C5KVMA-R-600M (remote unit) using a VMATINT-xx cable (xx=3,6,10,15 or 25 foot length). Use the appropriate cable for the application (see chart below). Make sure all connections are firmly seated.
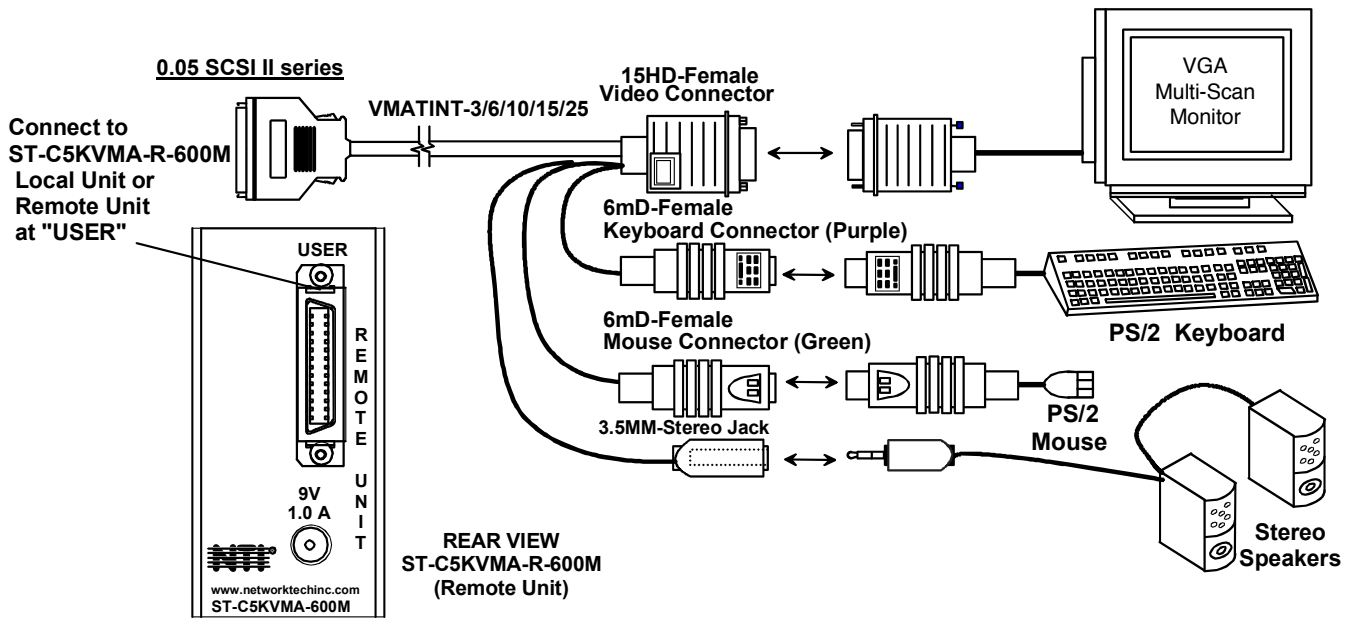
Figure 19- Connect cable between user and module

Cables for connecting 600M modules to user devices

Cable To Use	Features Supported:			
	Video	Keyboard/Mouse	Audio	RS232
VMCTINT-xx	Y	Y	N	N
VMATINT-xx	Y	Y	Y	N
VMRSTINT-xx	Y	Y	N	Y
VTINT-xx	Y	N	N	N
VATINT-xx	Y	N	Y	N
VRSTINT-xx	Y	N	N	Y

xx= 3, 6, 10, 15 or 25 foot length

Connect the CAT5 cable

Connect the CAT5 cable to the "CAT5" port on the front of the Local Unit (see Figure 20). When properly inserted the cable end should snap into place. Connect the other end of the cable to the "CAT5" port on the Remote Unit.

WARNING: Never connect the XTENDEX 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.

Figure 20- Connect the CAT5 cable between the Local and Remote Units

Plug-in and Boot Up

1. Plug the power cord(s) from the monitor(s) into power outlet(s).
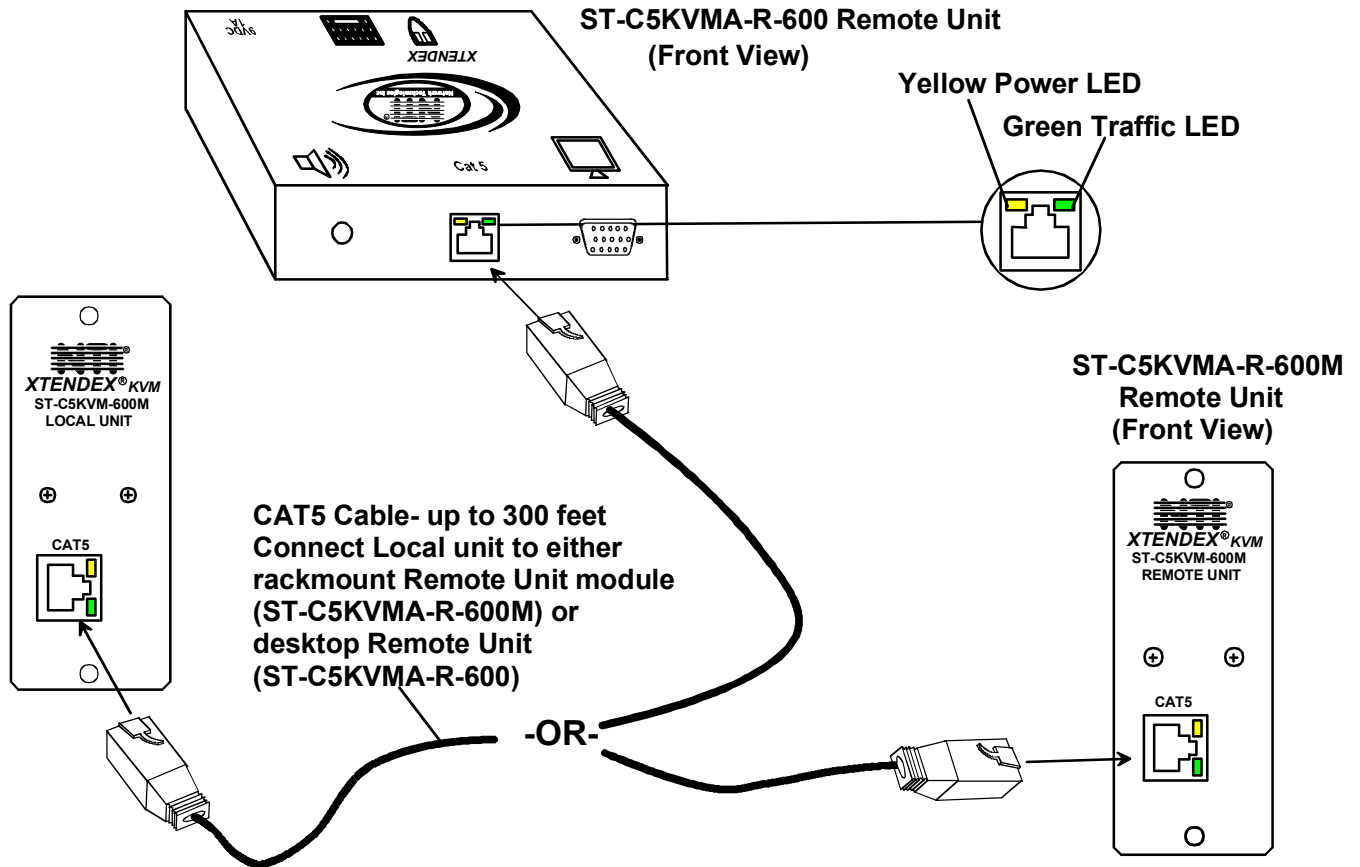
2. Connect the AC adapter power connectors to the 9VDC ports on the Remote and Local Units.   (AC adapter shown in Figure 21)

3. Plug the AC adapters into power outlets. The "Power" LED (yellow) on the CAT5 connector of each unit should illuminate, indicating that a proper power connection has been made.

4. Turn ON the CPU and monitor(s). The CPU and monitor(s) should each react as if they were directly connected to each other.   The green "Traffic" LEDs on the Remote and Local Units (see Figure 20) should blink indicating there is proper communication between them.

Note: A loss of signal (blank screen) may be experienced for an instant during the automatic video quality adjustment process after powering-up.   This may also occur if the XTENDEX senses a loss of or weak signal connection in the CAT5 cable.
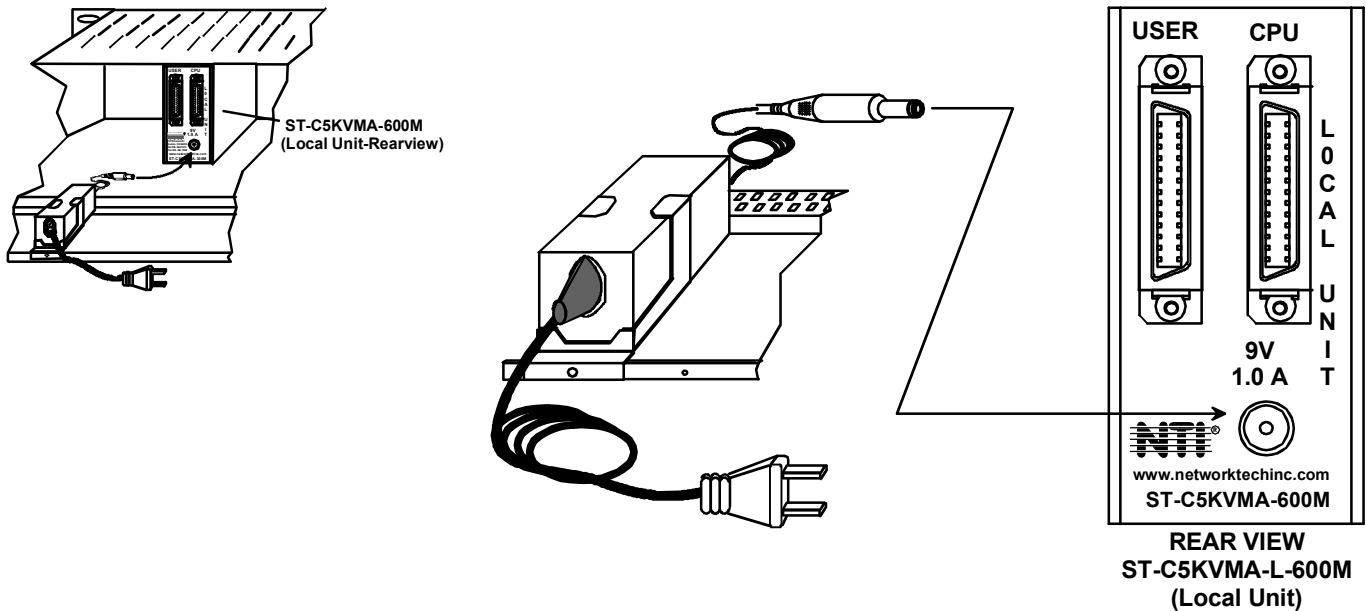

Figure 21- Connect AC adapters

VIDEO QUALITY

Automatic Video Quality Adjustment (see chart on page 1)

Video quality adjustment is done automatically to assure the image is as clear as possible.

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.

Manual Video Quality Adjustment (see chart on page 1)

 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 (see Figure 22) 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.
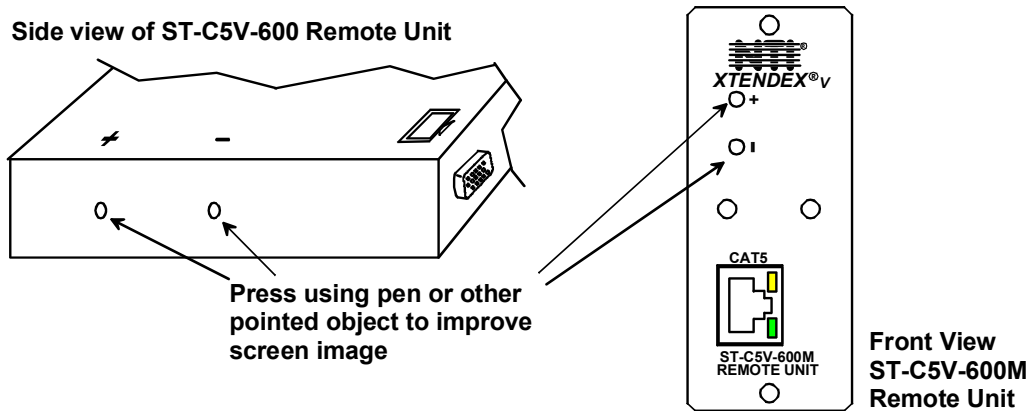
Figure 22- Buttons for video quality adjustment

If the image still lacks definition, configuration adjustments may need to be made to the attached video display equipment.   This is a problem most often seen in LCD displays. Check the manual for the equipment having the poor display and look for an "auto-adjust" or "auto-configure" feature.   Once this is done, you may need to repeat the Video Quality Adjustment procedure described above to achieve the best image.

TECHNICAL SPECIFICATIONS

Models with VGA Video	
Video Compatibility	SVGA, XGA, VGA
Video Coupling	DC
Video Connectors	HD15 male to CPU HD15 female to monitor
Input / Output Impedance	75 Ohms
Input Horizontal Frequency Range	15kHz to 130 Hz
Input Vertical Frequency Range	30 Hz to 150 Hz
Sync Types Supported	Separate and composite TTL Level and sync on green
Video Maximum I/O Levels	1.45Vp-p
Models with S-Video	
Video Compatibility	All s-video displays and sources
Video Coupling	DC
Video Connectors	4 pin miniDIN male to video source 4 pin miniDIN female to display
Video Maximum I/O Levels	1.45Vp-p
Input / Output Impedance	75 Ohms
Models with Keyboard/Mouse support	
Keyboard/Mouse Connectors	Female 6 pin miniDIN to Keyboard and Mouse Male 6 pin miniDIN to CPU device ports
Mouse and Keyboard Compatibility	All PS/2 mice and keyboards
Keyboard and Mouse Current Rating	500mA maximum
Models with Audio Support	
Audio Connectors	3.5mm stereo jack to speakers 3.5mm stereo plug to CPU (VGA Video Models) RCA phono plug to audio source (S-Video Models)
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
Models with RS232 Support	
RS232 Connectors	9D male to device 9D female to CPU
RS232 Baud Rate	56K bps maximum (no adjustment for baud rate is needed)
RS232 Compatibility	RXD, TXD, RTS, DTR, CTS, DSR
General	
Interconnect Cable	CAT5/5e/6 Solid UTP EIA/TIA 568 B wiring w/ male RJ45 connectors
Remote and Local Unit Power	120V or 240V at 50 or 60Hz-9VDC/1.0A via AC Adapters (2)
Dimensions WxDxH (In.) (Local or Remote)	3.1x3.4x1 (Desktop models)
Dimensions WxDxH (In.) (Local or Remote)	1.4x6.8x3.5 (Rackmount modules)

Distances and Resolutions for CAT5/CAT5e and CAT6 Cables
Unshielded Twisted Pair (UTP)   Resolutions

UTP CABLE	DISTANCE (feet)	RESOLUTION
CAT5/CAT5e	600	1024x768 at 60Hz
CAT5/CAT5e	400	1280x1024 at 60Hz
CAT5/CAT5e	300	1600x1200 at 60Hz
CAT5/CAT5e	100	1920x1440 at 60Hz
CAT6	300	1024x768 at 60Hz
CAT6	200	1280x1024 at 60Hz
CAT6	100	1920x1440 at 60Hz

INTERCONNECTION CABLE WIRING METHOD

The connection cable between the remote and local is terminated with RJ45 connectors and must be wired according to the EIA/TIA 568 B industry standard.   Wiring is as per the table and drawing below.

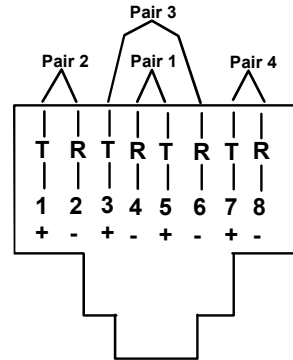| Pin	Wire Color	Pair	Function
1	White/Orange	2	T
2	Orange	2	R
3	White/Green	3	T
4	Blue	1	R
5	White/Blue	1	T
6	Green	3	R
7	White/Brown	4	T
8	Brown	4	R

Figure 23- 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.networktechinc.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
Remote or Local Unit yellow power LED does not illuminate	• Power supply is not connected or plugged-in.	• Make sure outlet is live and AC adapter is plugged-in. (one for the Remote and one for the Local) • Make sure 9VDC jack is fully connected
Local power LED does not illuminate when the CPU is powered	• The keyboard connector is not properly plugged in	• Check keyboard connection
No Video on monitor	• One or more video cables is loose or disconnected. • No power to Remote or Local Units. • Video Cable was not attached when CPU was booted. • CAT5 cable is not connected.	• Check all video cable connections • Make sure yellow LEDs are illuminated for local and remote. If not, see solutions for first two problems above. • With all the cables properly connected, reboot the CPU. • Check cable connections. Make sure they are snapped-in properly and completely and reboot.
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. • Video not 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. • Check cable connections and power cycle. If model has manual quality adjustment buttons see page 22 for adjustment instruction.

Problem	Cause	Solution
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.
Monitor 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.
Wrong or missing characters from those typed	The keyboard may be in the wrong mode.	• Disconnect keyboard at Remote Unit end and reconnect. • Reboot the system.
CPU doesn't detect the keyboard and the mouse	• Keyboard cable or mouse cable are loose or reversed • Cat 5 cable is too long	• Check cable connections • Cat 5 cable can be no more than 600 feet in length
IBM Scroll Point mouse is not recognized by CPU	Only one IBM Scroll Point mouse is connected at either the Local or Remote unit	• In order for an IBM Scroll Point mouse to be recognized, an IBM Scroll Point mouse must be connected at <u>both</u> the Local and Remote extender units. Otherwise it will be recognized and work only as a Microsoft Intellimouse.
Image is not displayed properly, lacks definition	Signal is being skewed by the CAT5 cable and not being received correctly by the monitor .	• Check the user's manual for the monitor, projector, or display equipment for an "automatic adjustment" or "auto-configure". This is most common to LCD type monitors.
Models with RS232 Support		
No RS232 communication	• One or more RS232 cables is loose or disconnected	• Check all RS232 cable connections
Models with Audio Support		
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 connected and powered • Check CAT5 cable connections

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WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years 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.networktechinc.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

Note: CAT5 connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products should not be run underground, outdoors or between buildings.

WARNING: Outdoor or underground runs of CAT5 cable could be dangerous and will void the warranty.

Manual 014 Rev. 6/26/09