XTENDEX™ Series

EXTENDERS
Installation and Operation Manual

ST-C5KVM-300
PS/2 KVM Extender

ST-C5V-300
Video Extender

ST-C5KVMA-300
PS/2 KVM and Audio Extender

ST-C5VA-300
Video and Audio Extender

MAN074 Rev Date 6/26/2006

TRADEMARK

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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.

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 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.

MAN074 Rev Date 6/26/2006

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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 300 feet away from a PS/2 CPU via Category 5 unshielded twisted-pair cable. The local user will be located near the CPU.

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 300 feet away)

- Compatible with VGA and XGA systems

- Provides crisp and clear resolution up to 1280 x 1024 @ 300 feet (see page 11 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, for varying lengths of cable, is manually adjustable (see page 10) 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 CAT5-300 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
ST-C5KVM-300	VGA	Yes	No
ST-C5KVMA-300	VGA	Yes	Yes
ST-C5V-300	VGA	No	No
ST-C5VA-300	VGA	No	Yes

MATERIALS

Materials Included with this kit:

- ✓ NTI XTENDEX Local Unit
- ✓ NTI XTENDEX Remote Unit
- ✓ 120VAC or 240VAC at 50 or 60Hz-9VDC/1.0A AC Adapters (KVM/KVMA models include 2, V/VA models include 1)
- ✓ 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. 12 for proper EIA/TIA 568 B wiring method)

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

Model	Cable(s) needed
ST-C5KVM-300	VKMEXT-xx
ST-C5KVMA-300	VKMEXT-xx and SA-xx-MF
ST-C5V-300	VEXT-xx
ST-C5VA-300	VEXT-xx and SA-xx-MF

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.

(Front View)   ST-C5KVMA-300 Local Unit   (Rear View)
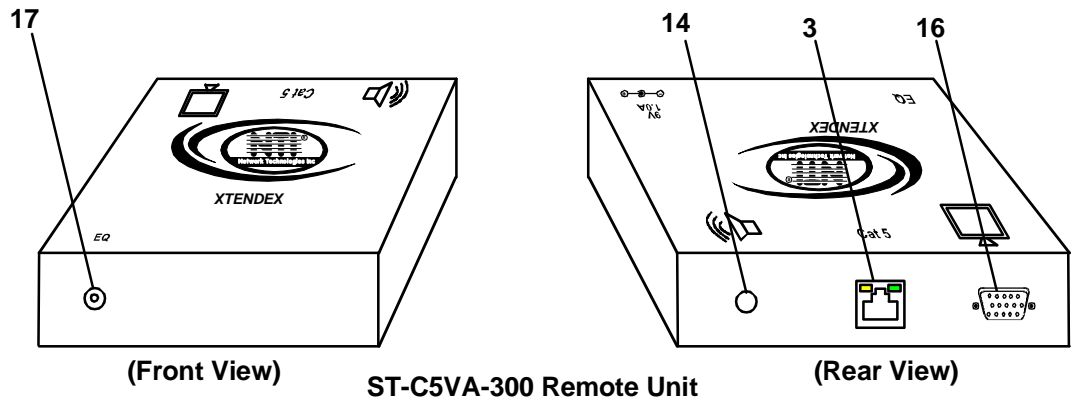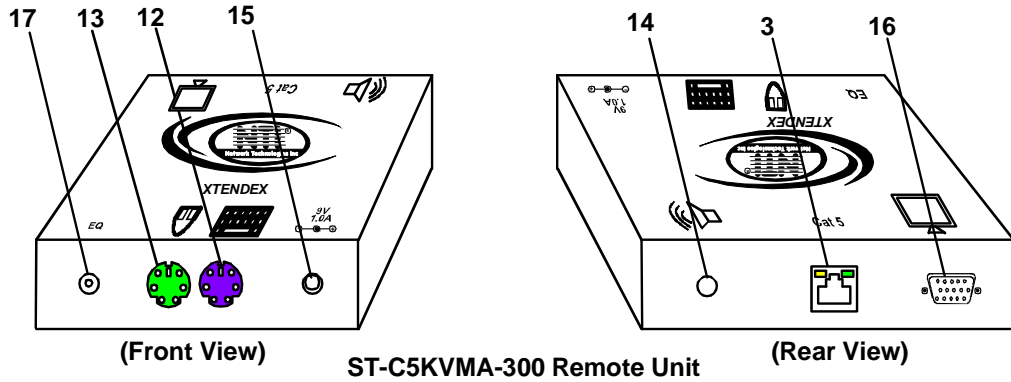

(Front View)   ST-C5VA-300 Local Unit   (Rear View)
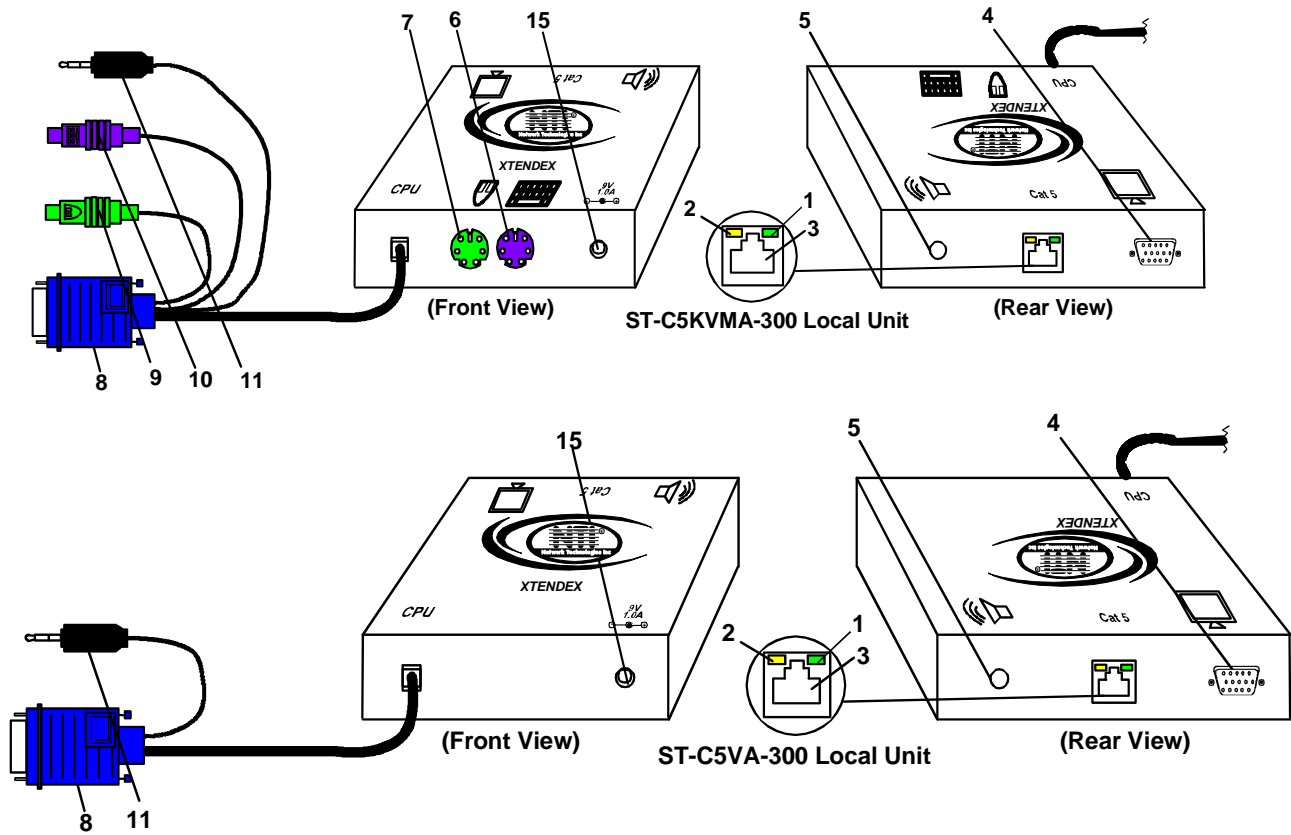
FEATURES AND FUNCTIONS

1. Green LED- power indicator- illuminates when power has been supplied to the unit

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

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

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

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

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

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

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

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

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

14. 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

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

17. "EQ" screw- for manually adjusting video quality

(Front View)   ST-C5KVMA-300 Remote Unit   (Rear View)

(Front View)   ST-C5VA-300 Remote Unit   (Rear View)

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 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

- 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, fluorescent lighting, 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 Remote Unit

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 Fig. 1)(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 audio support, connect the cable from the remote speakers to the 3.5mm stereo audio jack on the Remote Unit. (See Fig. 2)
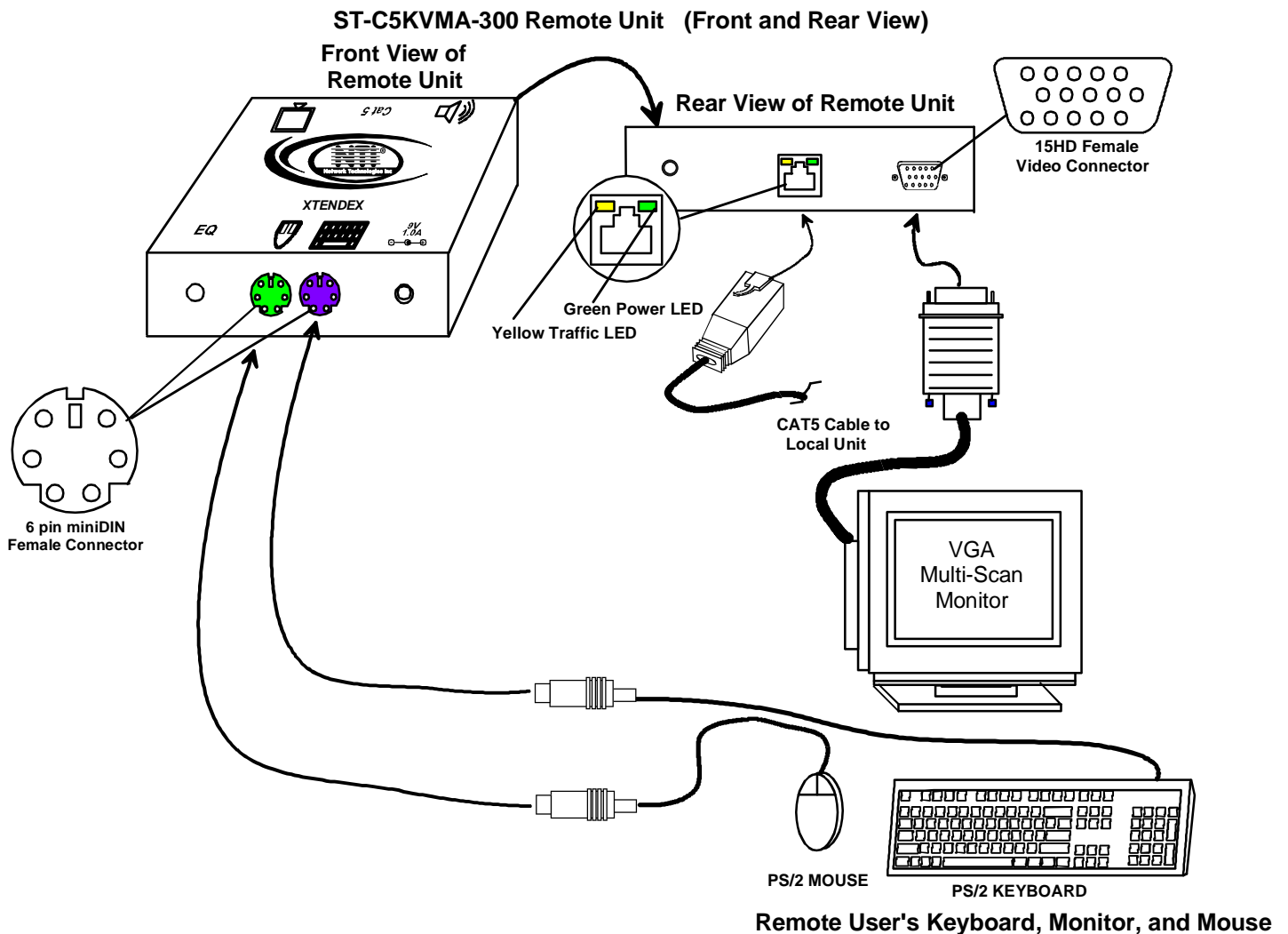
ST-C5KVMA-300 Remote Unit   (Front and Rear View)

Figure 1- Connect the Extended Components to the Remote Unit

ST-C5KVMA-300 Remote Unit

(Rear View)

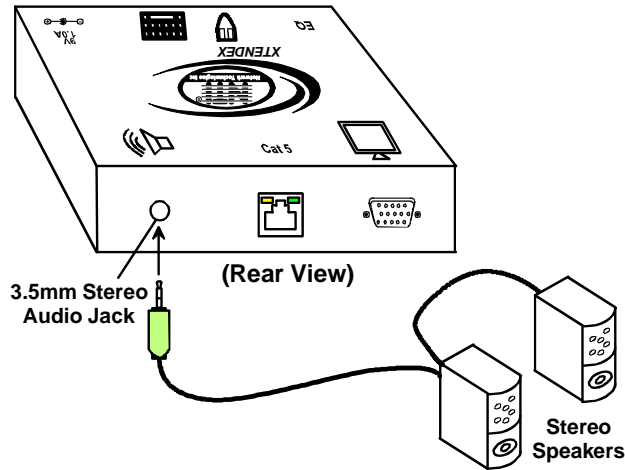3.5mm Stereo
Audio Jack

Stereo
Speakers

Figure 2- Connect speakers to the 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 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.

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.*
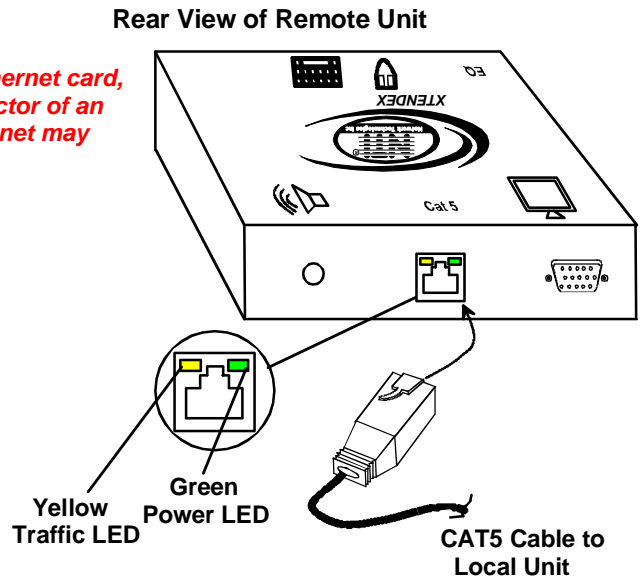

Yellow
Traffic LED

Green
Power LED

CAT5 Cable to
Local Unit

Figure 3- Connect the CAT5 cable to the Remote Unit

Installing The Local Unit

1. Make connections for a local user (see Fig. 4)

    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 mouse to the green 6 pin miniDIN female port on the Local Unit.

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

ST-C5KVMA-300 Local Unit   (Front and Rear View)

Front View of Local Unit

Rear View of Local Unit

XTENDEX

CPU

15HD Female Video Connector

Green Power LED

Yellow Traffic LED

6 pin miniDIN Female Connector

CAT5 Cable to Remote Unit

VGA Multi-Scan Monitor

PS/2 MOUSE

PS/2 KEYBOARD

Local User's Keyboard, Monitor, and Mouse
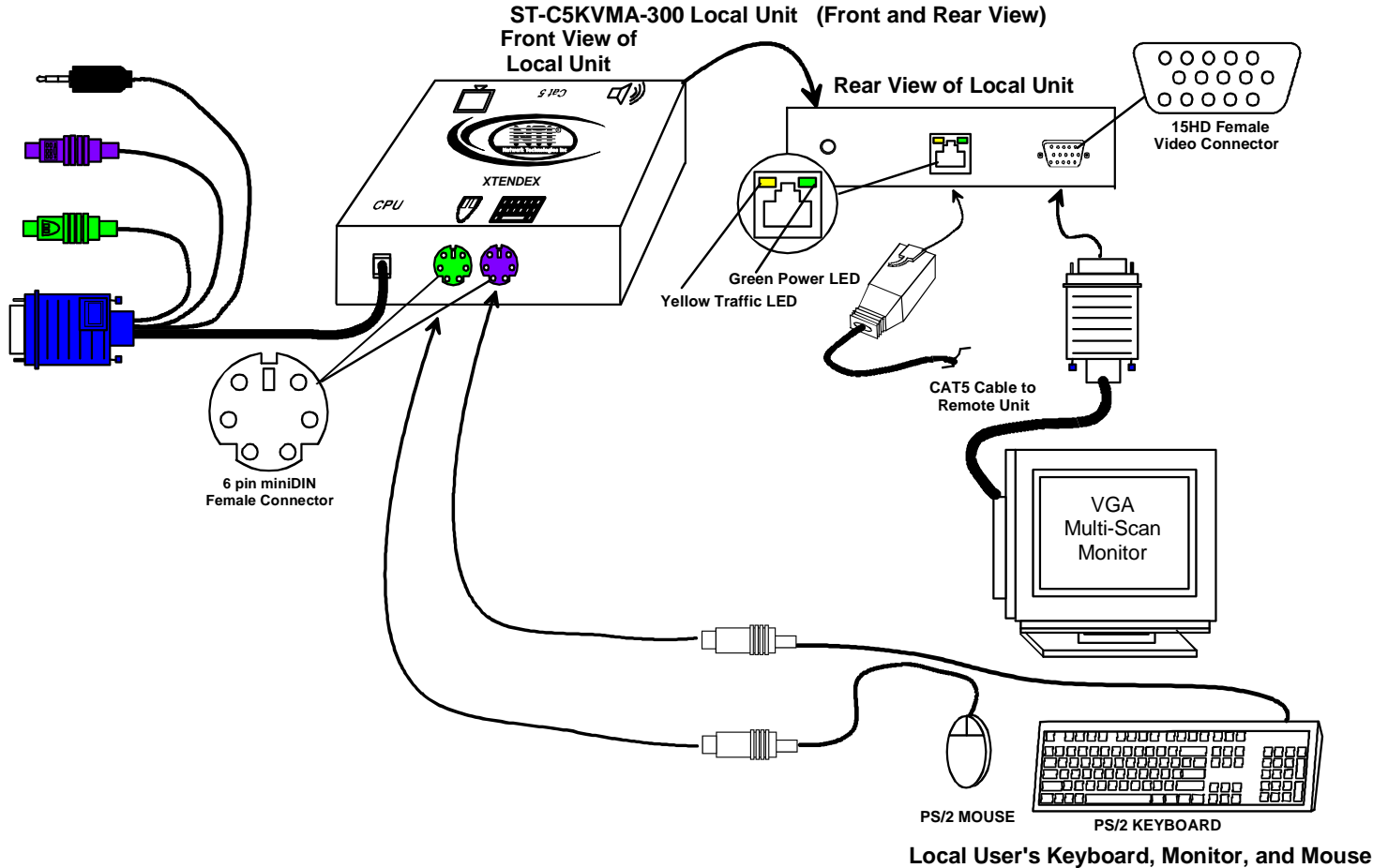
Figure 4- Connect the local user to the XTENDEX Local Unit

d) 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 Fig. 5)
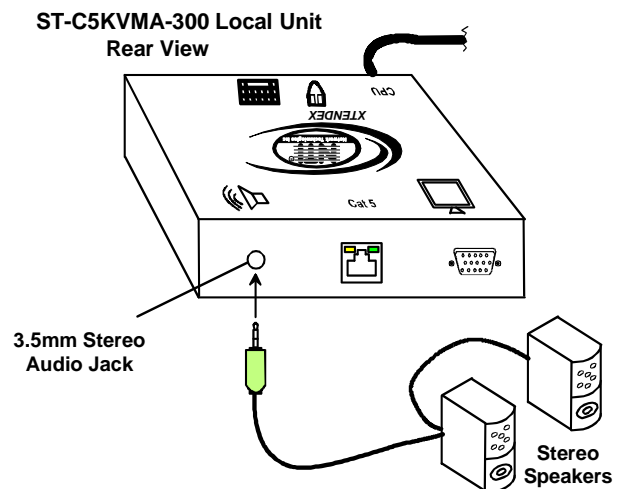
ST-C5KVMA-300 Local Unit
Rear View

XTENDEX

CPU

Cat 5

3.5mm Stereo Audio Jack

Stereo Speakers

Figure 5- Connect speakers to Local Unit with audio support

2. Plug the cables of the Local Unit into the back of the CPU. (See Fig. 6.)

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

   b) 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)

   (Mouse)

   c) 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)
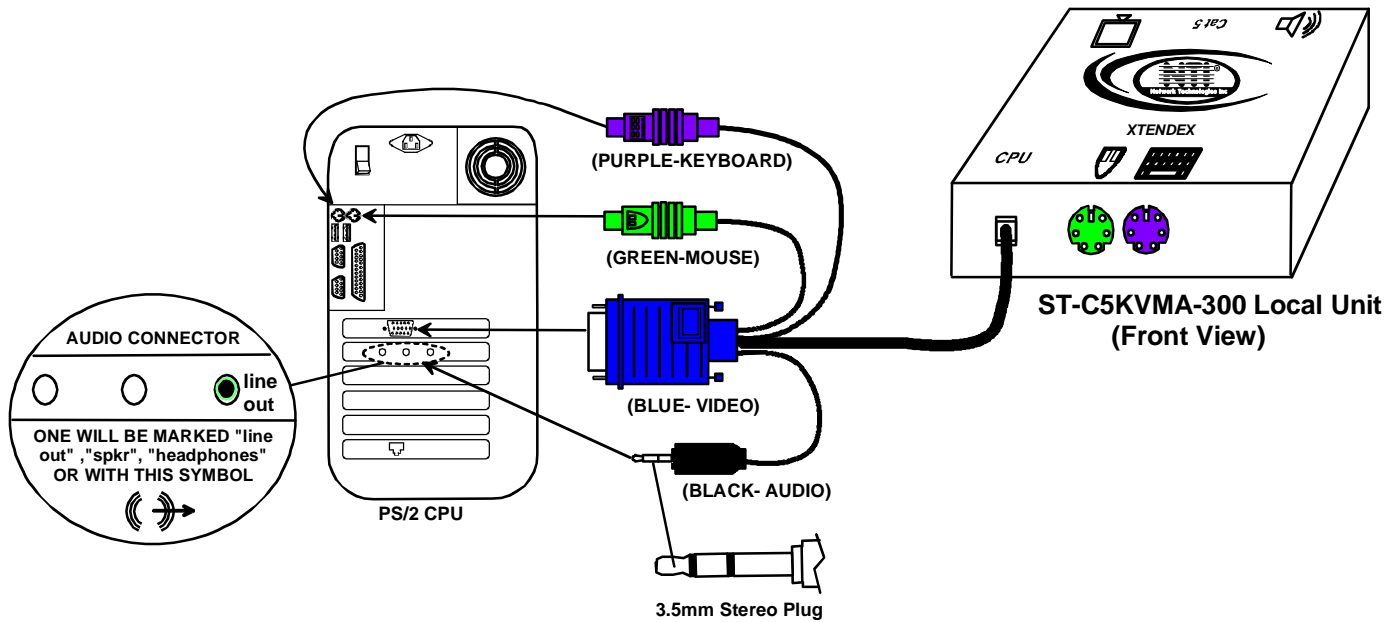
   (Keyboard)
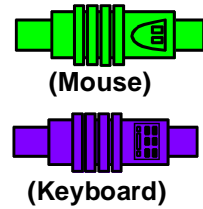
Figure 6- Connect the Local Unit with VGA video and audio support to the CPU

   d) 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 Fig. 6)

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

Connect The CAT5 Cable

Connect the CAT5 cable to the "Cat 5" port on the Local Unit. (See Fig. 7.) 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.
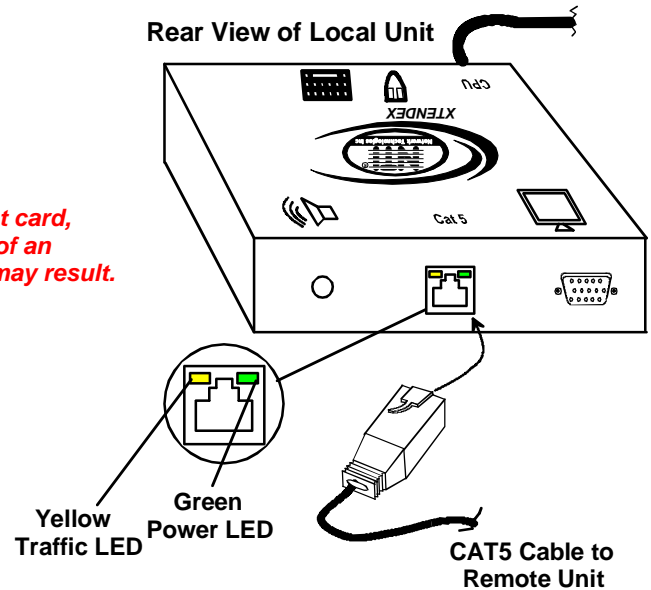
Rear View of Local Unit

Yellow Traffic LED

Green Power LED

CAT5 Cable to Remote Unit

Figure 7- Connect CAT5 cable to Local Unit

Plug-in and Boot Up

For ST-C5V-300 and ST-C5VA-300 models

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

2. Connect the AC adapter power connector to the 9VDC ports on the Local Unit. Plug the AC adapter into a power outlet. The green 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 Fig. 8.)

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

Note: The yellow LED on each RJ45 connector will illuminate only on VA models anytime data traffic is passing between the Local and Remote Units, indicating proper CAT5 cable connection and communication. (See Fig. 7)

Front View of ST-C5V-300 Local Unit

9 VDC ADAPTER

Cable to CPU

Barrel

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

Figure 8- Connect the AC adapter to the Local Unit

For ST-C5KVM-300 and ST-C5KVMA-300 models

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

5. Connect the AC adapter power connectors to the 9VDC ports on the Remote and Local Units. Plug each AC adapter into a power outlet.   The green LED on the RJ45 connector of the Remote and Local Units should illuminate, indicating that a proper power connection has been made.   (See Fig. 9.)

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

Note: The yellow 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 Fig. 9)
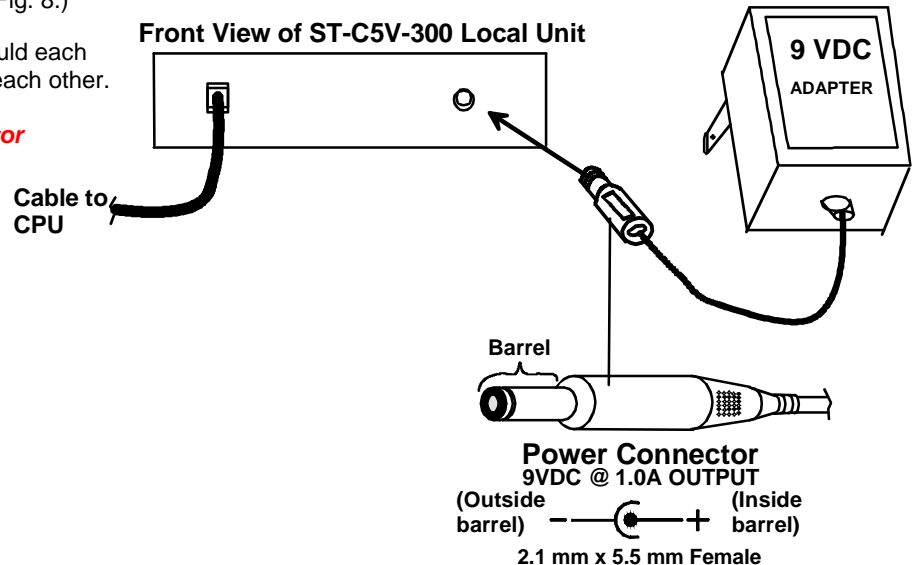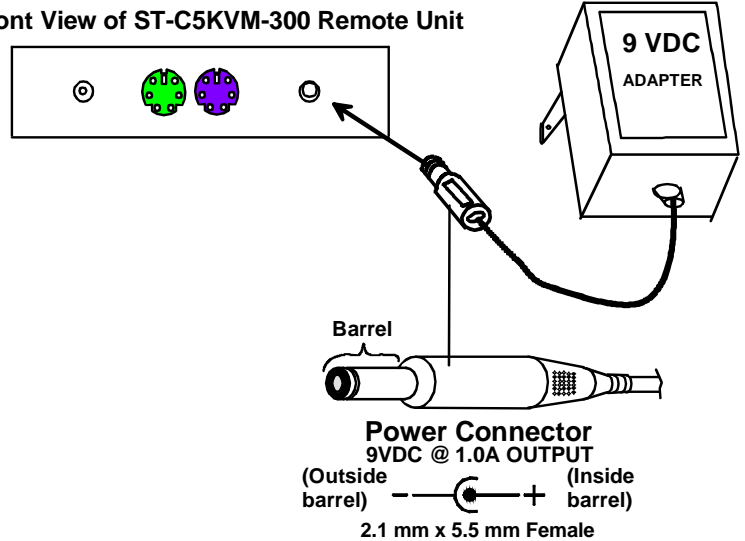
Front View of ST-C5KVM-300 Remote Unit

9 VDC ADAPTER

Barrel

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

Figure 9- Connect the AC adapter to the Remote Unit

VIDEO QUALITY ADJUSTMENT

 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 turn the "EQ" screw on the Remote Unit to equalize the signal between the Local and Remote Units. Turn the "EQ" screw using a very small screwdriver (see Fig. 10) until the image is crisp and clear.   Turn the screw counterclockwise if the image is not crisp and clear enough.   Turn the screw clockwise if the image has been over-corrected (such that horizontal lines appear to trail or shadow at the edge of an open window).   A very small amount of rotation will make a minor change in the image. Ultimately, the image quality should improve to a satisfactory level.

Note: When the cable is longer than 150 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.
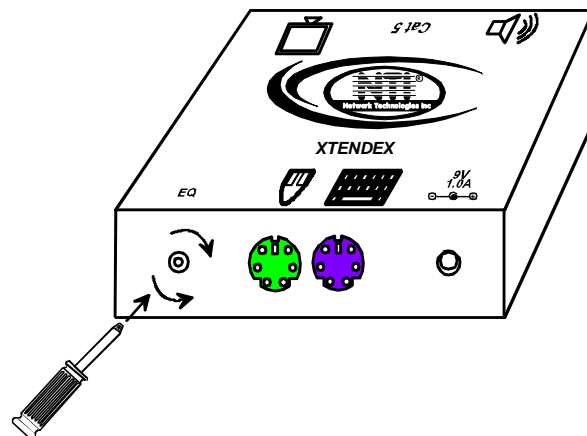
Front View of Remote Unit

Cat 5

XTENDEX

EQ

9V
1.0A

Figure 10- Turn "EQ" screw for video quality adjustment

TECHNICAL SPECIFICATIONS

All Models	
Video Compatibility	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 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
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
General	
Interconnect Cable	CAT5/5e/6 Solid UTP EIA/TIA 568 B wiring w/ male RJ45 connectors

Local Unit Power
     ST-C5KVM/ST-C5KVMA
     ST-C5V/ST-C5VA
	• 120V or 240V at 50 or 60Hz-9VDC/1.0A via AC Adapter
	• 120V or 240V at 50 or 60Hz-9VDC/1.0A via AC Adapter

Remote Unit Power
     ST-C5KVM/ST-C5KVMA
     ST-C5V/ST-C5VA
	• 120V or 240V at 50 or 60Hz-9VDC/1.0A via AC Adapter
	• powered by Local Unit through CAT5 cable

Local Power Consumption (no devices attached)	• ST-C5V: 105 mA • ST-C5VA: 220 mA • ST-C5KVM: 200 mA • ST-C5KVMA: 230 mA
Remote Power Consumption (no devices attached)	• ST-C5V: 105 mA • ST-C5VA: 220 mA • ST-C5KVM: 180 mA • ST-C5KVMA: 205 mA
Size (In.) WxDxH	3.25x3.4x1

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

UTP CABLE	DISTANCE (feet)	RESOLUTION
CAT5/CAT5e	300	1280x1024 at 60Hz
CAT5/CAT5e	150	1600x1200 at 60Hz
CAT5/CAT5e	100	1920x1440 at 60Hz
CAT6	300	1024x768 at 60Hz
CAT6	150	1280x1024 at 60Hz
CAT6	100	1600x1200 at 60Hz

INTERCONNECTION CABLE WIRING METHOD

The CAT5 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.

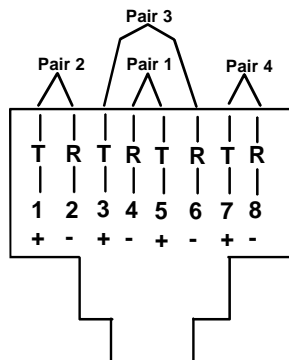| Pin	Wire Color	Pair	Function
1	White/Orange	2	T
2	Orange	2	R
3	White/Green	3	T
4	Blue	1	R
5	White/Blue	1	T
6	Green	3	R
7	White/Brown	4	T
8	Brown	4	R

Figure 11- 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 green 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
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 green LEDs are illuminated for local and remote. If not, see solutions for first 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.
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-300'. • Check cable connections. Make sure they are snapped-in properly and completely. • Check cable connections. • See page 10 for video quality 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 300 feet in length
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

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.networktechinc.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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