XTENDEX® Series

ST-C6USBH-300

ST-C6USBHU-300

400 FOOT USB AND HDMI EXTENDER

Installation and Operation Manual

ST-C6USBHU-300 Local and Remote Unit

HDMI® HIGH-DEFINITION MULTIMEDIA INTERFACE

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: CATx 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 CATx cable could be dangerous and will void the warranty.

WARNING: The CATx connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products must be wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.) The use of a CROSSOVER CABLE will damage the extender and void your warranty.

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INTRODUCTION

The XTENDEX Series ST-C6USBH-300 CAT6 HDMI Extender (XTENDEX) provides remote KVM (USB keyboard, USB mouse and HDMI monitor) access to a USB computer up to 400 feet over CAT6a/7 cable. Each extender consists of a local unit that connects to a USB computer and a remote unit that connects to an HDMI monitor and USB keyboard and mouse as much as 400 feet away via Category 6a or 7 twisted-pair cable.

The XTENDEX Series Extender is extremely simple to install and has been thoroughly tested to insure reliable performance. Through the use of CAT5e/6/6a/7 (CATx) 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:

- Transmits all signals over one CATx cable.

- Supports HDTV resolutions to 1080p and computer resolutions to 1920x1200 (WUXGA).

   o Refer to the resolution chart in the specifications section for resolutions using different CATx cable types and lengths

- HDMI features supported:

   o 12-bit Deep Color

   o xvYCC.Color Space

   o Dolby TrueHD, DTS-HD Master Audio, Dolby Digital, and DTS

   o Bandwidth up to 225 MHz (6.75 Gbps)

   o Support for CEC (consumer electronic control) compatible devices.

   o Lip Sync

- HDCP compliant.

- Supports the DDC2B protocol.

- High quality, rugged steel construction with durable powder coat finish.

- Keyboard and mouse are hot-pluggable.

- Keep-alive keyboard/mouse emulation for flawless operation.

- Only one power supply is necessary. (Power supply can be connected to either the local or remote unit.)

Available with optional additional USB 2.0 (low/full speed) port. (ST-C6USBH**U**-300)

- Additional USB port on the remote unit, use to connect a 3M or Elo USB touch screen monitor, NEC Multisync E222W touch screen monitor, CAC card reader, SMART Board™ interactive whiteboard, SMART Podium™ interactive pen display, or Motorola Symbol LS3408 bar code scanner.

MATERIALS

Materials Included with ST-C6USBH-300 kit:

- ✓ NTI XTENDEX Local Unit
- ✓ NTI XTENDEX Remote Unit
- ✓ 1-HDMI-3-MM 3 foot male-to-male HDMI video cable
- ✓ 1-USB2-AB-1M-5T   1 meter USB Type A male-to-USB Type B male cable
- ✓ 1-100VAC to 240VAC at 50 or 60Hz-24VDC/1.0A AC Adapter
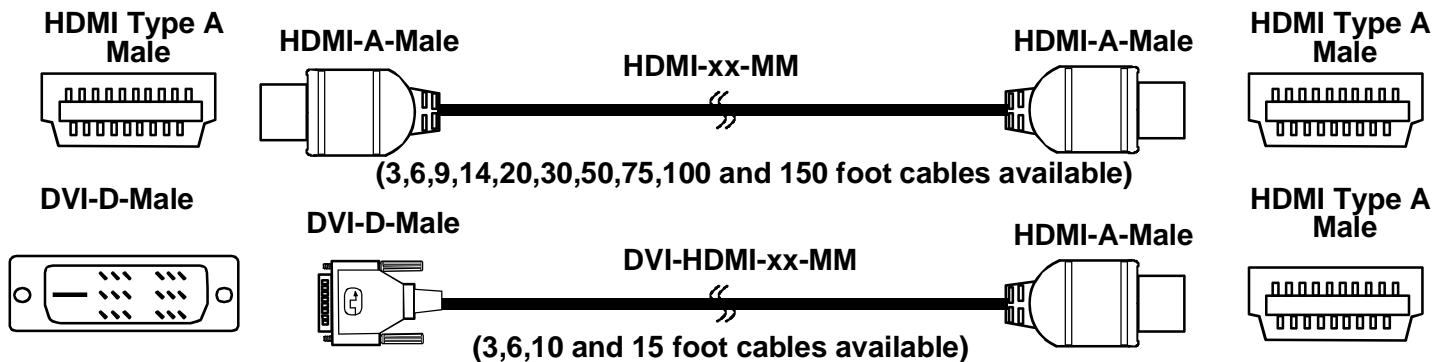- ✓ 1- Power Cord- country specific

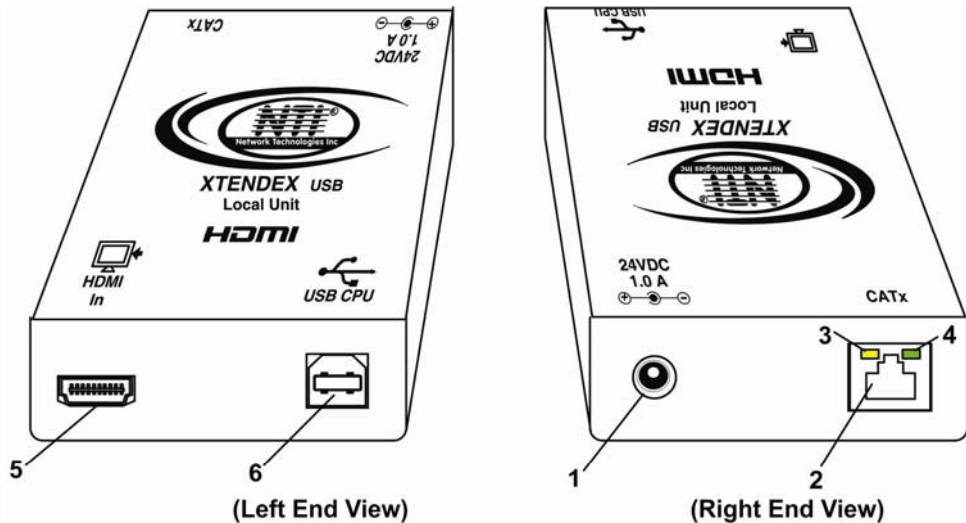**Additional materials may be required but are <u>not supplied</u>:**

- ➤ CAT5e solid/stranded UTP ; 6/6a solid UTP; CAT7 solid STP (CATx) twisted-pair cables terminated with RJ45 connectors wired straight thru- pin 1 to pin 1, etc. (see page 11 for proper EIA/TIA 568 B wiring method)

- ➤ HDMI male-male cable to connect a HDMI source or display (Order NTI # HDMI-xx-MM where xx=3, 6, 9,14,20,30, 50,75,100 and 150 foot cable).

- ➤ DVI-D male to HDMI-A male single link cable to connect a DVI source or display (Order NTI # DVI-HDMI-xx-MM where xx=3, 6, 10, or 15 foot cable)

Always use the shortest possible cable for best performance.

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.

<u>DVI Cables available from NTI</u>

HDMI Type A Male **HDMI-A-Male** **HDMI-xx-MM** **HDMI-A-Male** **HDMI Type A Male**

(3,6,9,14,20,30,50,75,100 and 150 foot cables available)

DVI-D-Male **DVI-D-Male** **DVI-HDMI-xx-MM** **HDMI-A-Male** **HDMI Type A Male**

(3,6,10 and 15 foot cables available)

(Left End View)   (Right End View)

ST-C6USBHU-300 Local Unit

(Left End View)   (Right End View)
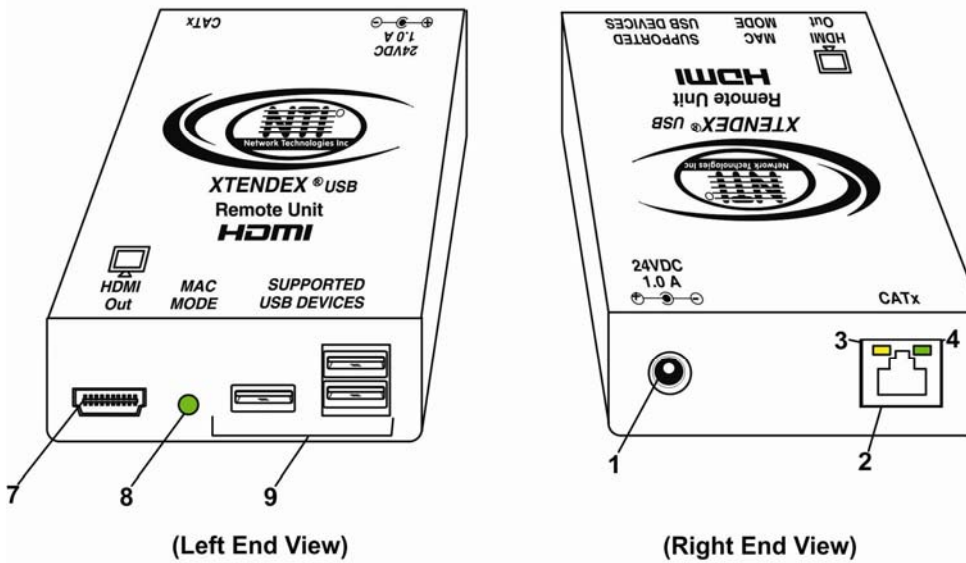
ST-C6USBHU-300 Remote Unit

CONNECTORS AND LEDS

| #	LABEL	CONNECTOR	DESCRIPTION
1	24VDC- 1.0A	1.0mm Power Jack	connection jack for the AC adapter (only the Local or the Remote Unit needs to be powered, not both)
2	CATx	RJ45 connector	for connecting the CAT5e/6/6a/7 cable between the Local and Remote units
3	Yellow LED	--	**traffic indicator**- illuminates when there is communication between the local and remote units.
4	Green LED	--	**power indicator**- illuminates when power has been supplied to the unit
5	HDMI In	HDMI female video connector	for connecting an HDMI cable between the Local Unit and the video source
6	USB CPU	USB Type B female	for connecting a USB port from the computer for keyboard and mouse control
7	HDMI Out	HDMI female video connector	for connecting the remote display device
8	MAC MODE	--	LED that will illuminate when the extender is configured to connect to a MAC CPU (see page 8)
9	SUPPORTED USB DEVICES	USB Type A female	for connection of a USB Keyboard and Mouse (2 Port Models). When extra port (3 total) is present a USB touch screen monitor, interactive whiteboard, or CAC card reader may be connected

LIMITATIONS

- The use of CAT5e or of any stranded cabling will reduce the maximum distance and resolution.

PREPARATION FOR INSTALLATION

- Locations should be chosen for the monitor that also has space to connect the Remote unit within the distance provided by the cables.   If extension cables are needed, contact NTI for the cables required.

- The CATx 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 video source and monitor 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 reconnection procedures before proceeding.

- When using with a wireless mouse and/or wireless keyboard, install the drivers for these devices to the PC **before** connecting them to the remote unit.

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TYPICAL APPLICATION
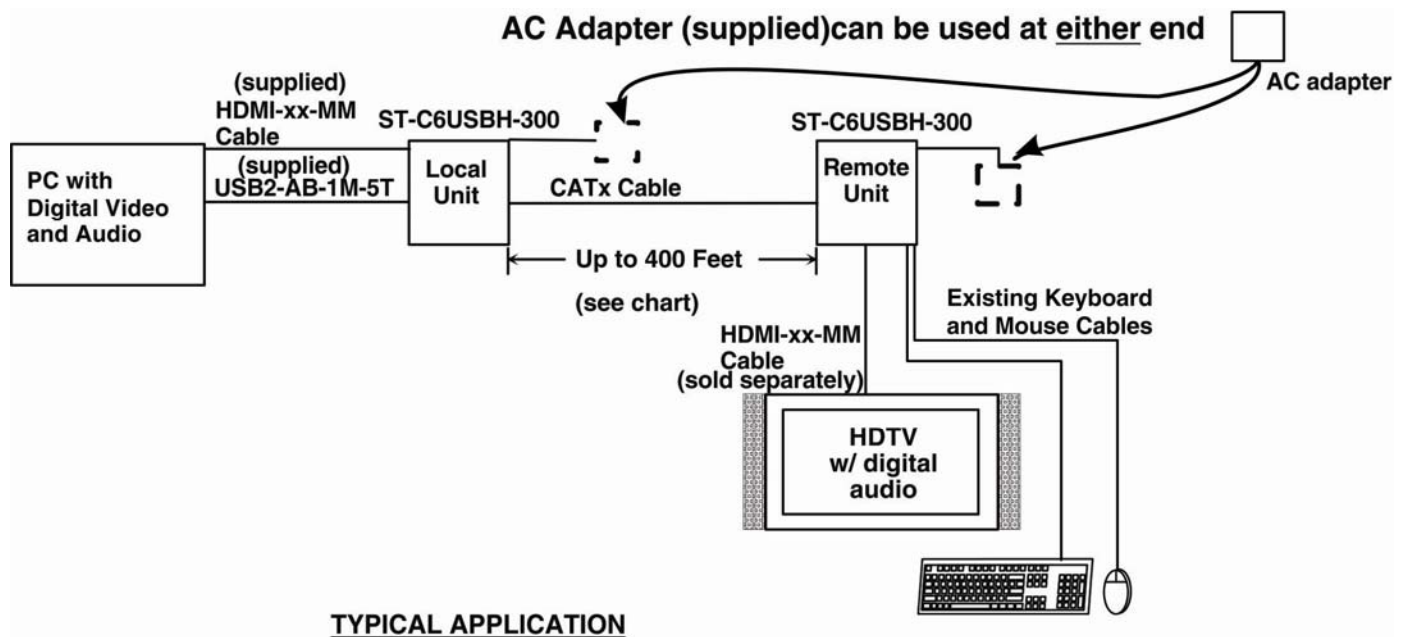
INSTALLATION

Installing The Remote Unit

1. Position the Remote Unit such that the CATx cable, the monitor cable(s), and device cables can each reach the Remote Unit without putting strain on the cables.
2. Connect a HDMI-xx-MM (or DVI-HDMI-xx-MM cable depending upon what connector your display will accept) to the female HDMI video connector labeled "HDMI Out" on the Remote Unit.
3. The keyboard and mouse cables can be plugged into the USB ports.
4. If your monitor is a touchscreen monitor with USB interface, and if you have an XTENDEX model with extra USB port (as seen below), the USB cable from the monitor can be connected to one of the USB ports. This extra port can also be used to connect a Whiteboard or CAC reader.

Note: Only model with the extra USB port present (model ST-C6USBHU-300) will support the use of a touchscreen monitor, CAC reader, or Whiteboard.
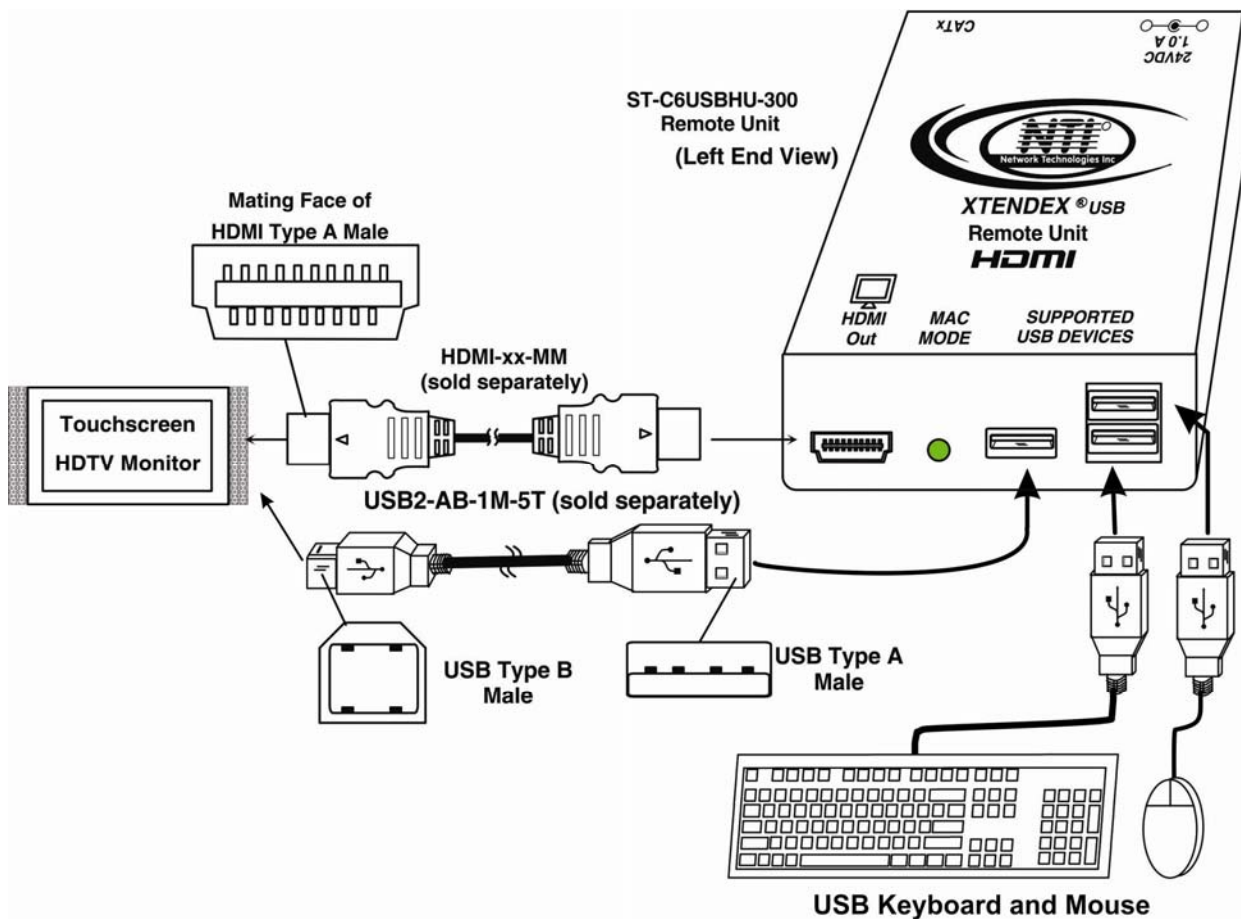

Figure 1- Connect the extended components to the Remote Unit

Installing The Local Unit

1. Connect an HDMI-3-MM (supplied) or DVI-HDMI-xx-MM cable (page 2) between the CPU and the "HDMI In" connector on the Local Unit.
2. Connect a USB2-AB-1M-5T USB cable (supplied) between a USB port on the CPU and the "USB CPU" connector on the Local Unit.
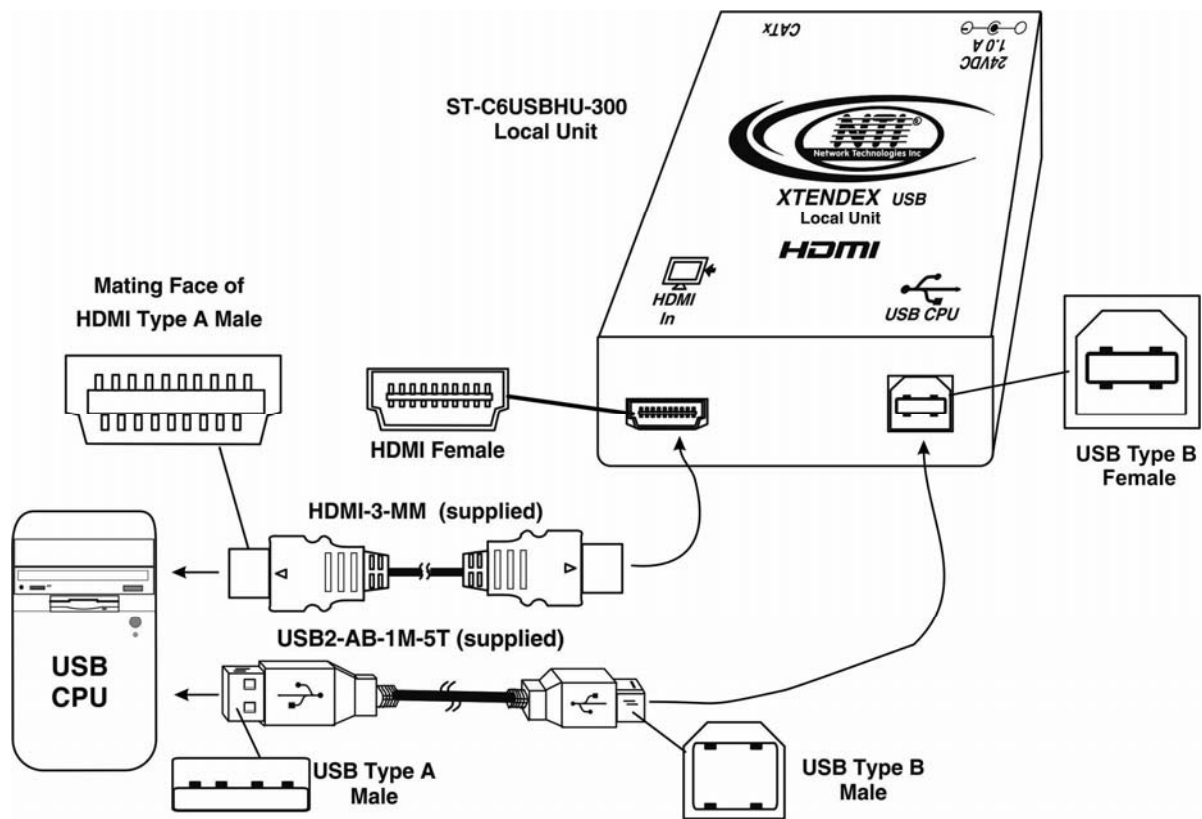
Figure 2- Connect the XTENDEX Local Unit to the source

Connect the CATx Cables

Connect the CATx cable between the "CATx" ports on the Local and Remote Unit. (See Figure 3) When properly inserted the cable ends should snap into place.

⚠ **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.**
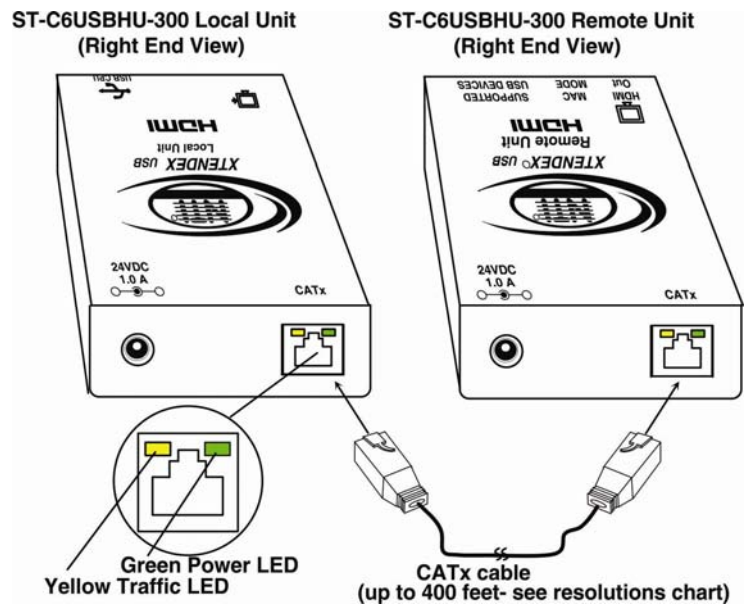
Figure 3- Connect CATx cable

Plug-in and Boot Up

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

2. Connect an AC adapter power connector to the 24VDC port on **either** the Remote Unit or 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 Figure 4)

3. Turn ON the CPU and monitor. The yellow LED on both the Local and Remote Units should illuminate. The CPU, monitor , keyboard and mouse should each react as if directly connected to each other.

The AC adapter can be connected to **either** the Local Unit OR the Remote Unit to make the XTENDEX function

Figure 4- Connect the AC adapter to either the Remote Unit or the Local Unit

MAC MODE

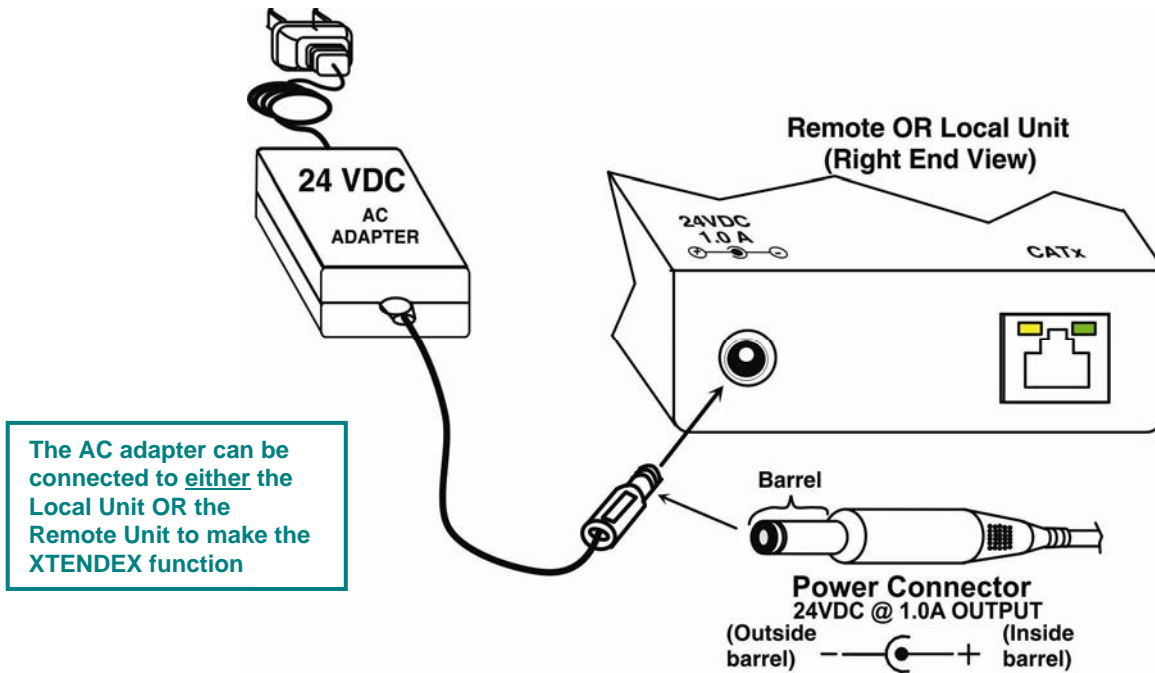MAC Mode enables the user to connect the Local Unit to a MAC CPU.   MAC Mode configures the Local Unit for passing mouse information to the MAC CPU. This is useful when the user wants to use mouse drivers provided by the mouse vendor, which allows the use of programmable functions for each mouse button. The Local Unit can be configured whenever necessary.

NOTE: When the port is connected to a PC or SUN CPU, MAC Mode should be OFF (the default setting).

To do this;
1. Enter Command Mode. (Simultaneously press the left and right `<Shift>` keys on the keyboard.   The keyboard LEDs will illuminate.)
2. If a MAC CPU is connected, press the `<M>` key. The keyboard LEDs will momentarily flash and the "MAC" LED on the Remote Unit will illuminate to indicate MAC Mode is ON. (See Figure 5)
3. To reconnect the XTENDEX to a SUN or Windows CPU (the default setting) , enter Command Mode again and press the `<M>` key again and the "MAC" LED will go OFF.
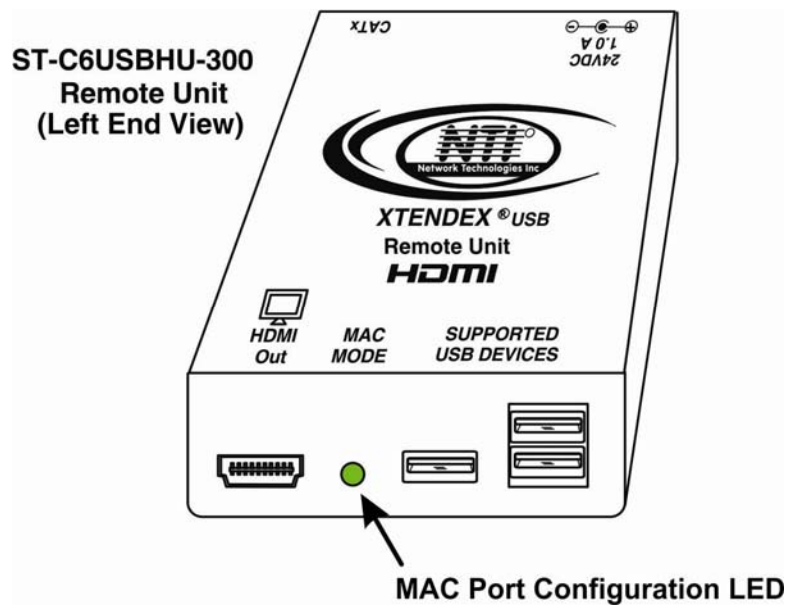4. Press `<Esc>` at any time to exit Command Mode.

Figure 5- MAC LED

After setting, the configuration is stored in memory and will be retrieved whenever the XTENDEX is powered ON.

TECHNICAL SPECIFICATIONS

Video	
Video Compatibility	PC Resolution up to 1920x1200 @60Hz / HDTV resolution up to 1080p @60Hz
Video Connectors	HDMI Type A Female
Input Video Signal	TMDS
Video Color Format	Standard (24bit); Deep color (30,36bit);RGB; 4:2:2; 4:4:4
HDMI Version	HDMI 1.3a
DVI Support	DVI 1.0
DDC Support	DDC2b
HDCP Version	HDCP 1.2
Audio	
Audio Format	LPCM,Dolby Digital (AC3)(Plus),DTS,DSD, Dolby TrueHD,DTS-HD Master Audio
Devices	
Keyboard/Mouse Connectors	USB Type A Female
Models w/Extra USB	USB Type A Female for USB 2.0 (low/full speed) device Maximum data rate: 12 Mbps
General	
Interconnect Cable	CAT5e solid/stranded UTP; CAT6/6a Solid UTP; CAT7 Solid STP EIA/TIA 568 B wiring with male RJ45 connectors
Operating Temperature	0-50º C
Operating Humidity Range	5 to 90% non-condensing RH
Remote Unit Power	100V to 240VAC at 50 or 60Hz-24VDC/1.0A via AC Adapter
Enclosure type	Electro-galvanized steel black powder coated
Size (In.) WxDxH	3.49x3.09x1.08
Compliance Certifications	CE, RoHS

Distances & Computer Resolutions for CAT5e/CAT6/CAT7 Cables

Cable	Distance (ft)	Max Std Resolution
CAT5e Solid UTP	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
	150	1280x1024 at 60Hz
		1024x768 at 60Hz
CAT5e Stranded UTP	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
CAT5e Stranded Shielded	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
	150	1280x1024 at 60Hz
		1024x768 at 60Hz
CAT6 Solid UTP (24 AWG)	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
CAT6 Solid UTP (23 AWG)	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
	150	1280x1024 at 60Hz
		1024x768 at 60Hz
CAT6 Solid FTP	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
CAT6 Solid Shielded	100	1920x1200 at 60Hz
		1600x1200 at 60Hz
	150	1280x1024 at 60Hz
		1024x768 at 60Hz
CAT6a Solid	150	1920x1200 at 60Hz
		1600x1200 at 60Hz
	250	1280x1024 at 60Hz
	325	1024x768 at 60Hz
CAT6a SFTP Solid,	175	1920x1200 at 60Hz
		1600x1200 at 60Hz
CAT7 Solid	225	1280x1024 at 60Hz
	350	1024x768 at 60Hz

Cable	Distance (ft)	Max HD Resolution
CAT5e Solid UTP	50	1080p/60Hz/24-bit
	100	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
	150	720p/60Hz/24-bit
		480p/60Hz/24-bit

Distances & Computer Resolutions for CAT5e/CAT6/CAT7 Cables

Cable	Distance (ft)	Max HD Resolution
CAT5e Stranded UTP	50	1080p/60Hz/24-bit
	100	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
CAT5e Solid Shielded	50	1080p/60Hz/24-bit
	100	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
CAT5e Stranded Shielded	50	1080p/60Hz/24-bit
	100	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
	150	720p/60Hz/24-bit
		480p/60Hz/24-bit
CAT6 Solid UTP (24 AWG)	100	1080p/60Hz/24-bit
CAT6 Solid UTP (23 AWG)	75	1080p/60Hz/36-bit
	100	1080p/60Hz/24-bit
	150	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
		720p/60Hz/24-bit
		480p/60Hz/24-bit
CAT6 Solid FTP	100	1080p/60Hz/24-bit
CAT6 Solid Shielded	100	1080p/60Hz/24-bit
	150	720p/60Hz/24-bit
		480p/60Hz/24-bit
CAT6a Solid	100	1080p/60Hz/36-bit
	125	1080p/60Hz/24-bit
	225	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
	300	720p/60Hz/24-bit
	400	480p/60Hz/24-bit
CAT6a SFTP Solid, CAT7 Solid	100	1080p/60Hz/36-bit
	125	1080p/60Hz/24-bit
	250	1080p/24Hz/24-bit
		1080i/60Hz/36-bit
	300	720p/60Hz/24-bit
	400	480p/60Hz/24-bit

INTERCONNECTION CABLE WIRING METHOD

The CATx connection cables between the Remote and Local are terminated with RJ45 connectors and must be wired according to the EIA/TIA 568 B industry standard.   Wiring is per the table and drawing below.
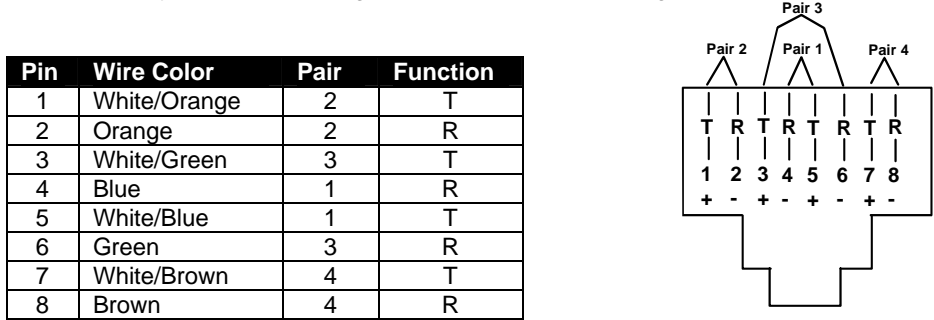
Pin	Wire Color	Pair	Function
1	White/Orange	2	T
2	Orange	2	R
3	White/Green	3	T
4	Blue	1	R
5	White/Blue	1	T
6	Green	3	R
7	White/Brown	4	T
8	Brown	4	R

Figure 6- View looking into RJ45 female

WARNING: The CATx connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products must be wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.) The use of a CROSSOVER CABLE will damage the extender and void your warranty.

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) on 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
Power LED does not illuminate	• Power supply is not connected or plugged-in.	• Make sure outlet is live and AC adapter is plugged-in. • Make sure 24VDC jack is fully connected
Power LED illuminates on one end, and not the other	• CATx cable not properly connected	• Check the CATx cable connection at both ends.
No Video on monitor	• One or more video cables is loose or disconnected. • No power to Remote Unit. • CATx cable is not connected. • CATx cable is too long • HDMI/DVI cable is too long	• Check all video cable connections • Make sure "Power" LED is illuminated on local and remote. If not, see solutions for first problem above. • With all the cables properly connected, power cycle the video/audio source. Make sure "Traffic" LED on local and remote is illuminated. • Make sure they are snapped-in properly and completely and reboot. • Switch to shorter cable or lower resolution (see table on page 10)
Video Picture is noisy	• All Video Cables are not firmly seated. • CATx cable is too long • HDMI/DVI cable is too long • The CATx cable is not properly connected. • CATx cable is poor quality for the length of cable used • CATx cable is installed near noisy equipment	• Check all connections. Make sure all cables are fully seated. • Switch to shorter cable or lower resolution (see table on page 10) • Check cable connections. Make sure they are snapped-in properly and completely. • Install a higher quality CATx cable. • Relocate run of CATx cable away from other electrical equipment
Monitor flashes or goes blank for a second or two	• Electrical power system is very noisy, particularly the ground. • The CATx cable is not properly connected. • CATx cable is too long • HDMI/DVI cable is too long	• Make sure the interconnection cable is not near any power lines. • Check cable connections. Make sure ends are snapped-in properly and completely. • Switch to shorter cable or lower resolution (see table on page 10)

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/return-policy.html for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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