XTENDEX® Series

ST-C6USBH(E)-HDBT
328 FOOT HDMI USB KVM Extender
via CATx Cable
Installation and Operation Manual

ST-C6USBHE-HDBT Remote and Local Unit

HDMI®

HIGH-DEFINITION MULTIMEDIA INTERFACE

TRADEMARK

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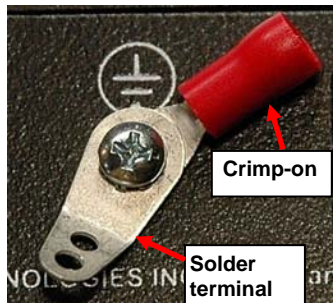
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CHANGES

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.

This product is equipped with grounding hardware to prevent interference from sources of electrical noise that could interfere with the normal operation of the XTENDEX or damage it. Use either the crimp-on lug or solder terminal to secure a properly grounded wire to the XTENDEX.

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INTRODUCTION

The XTENDEX® ST-C6USBH-HDBT HDMI USB KVM Extender over CATx cable provides remote KVM (USB keyboard, USB mouse and HDMI monitor) access to a USB computer up to 328 feet away over a single CAT5e/6/7 cable. Each video extender consists of a local unit that connects to a computer, and a remote unit that connects to a keyboard, monitor and mouse.

The XTENDEX Series Extender is extremely simple to install and has been thoroughly tested to insure reliable performance. Through the use of CAT5e/6/7 (CATx) cable it is possible to economically increase the flexibility of an entertainment system. Here are some of the features and ways this can benefit you:

- Transmits an uncompressed high speed HDMI signal over one CAT5e/6/7 cable.
- Supports HDTV resolutions to 1080p.
- Only one power supply is necessary to power both the local and remote units.
- HDMI features supported:
    - x.v.Color, sYCC601 color, Adobe RGB Color and Adobe YCC601 color
    - Dolby TrueHD, DTS-HD Master Audio, Dolby Digital, and DTS
    - Bandwidth up to 154 MHz (3.76Gbps)
    - Support for CEC (consumer electronic control) compatible devices.
    - Lip Sync
- HDCP compliant.
- Supports the DDC2B protocol.
- Full Infrared Remote (IR) control of HDMI source from remote HDTV using existing source remote control.
- USB ports for keyboard and mouse.
    - Keyboard and mouse are hot-pluggable.
    - Keep-alive keyboard/mouse emulation for flawless operation.
- Features an additional USB port on the remote unit for a touch screen monitor, interactive whiteboard, CAC card reader, or USB printer (requires firmware version 1.1 or later).
- Bi-directional RS232 interface.
- Integrated mounting brackets for easy surface/wall mounting.
- High quality, rugged steel construction with durable powder coat finish.

Optional: 100BaseT support on the transmitter and receiver for connecting standard network devices such as 100Base-T routers and hubs. (Add an "**E**" to the part number- order ST-C6USBH**E**-HDBT)

MATERIALS

Materials Included with ST-C6USBH(E)-HDBT kit:

- ✓ NTI XTENDEX Local Unit
- ✓ NTI XTENDEX Remote Unit
- ✓ 1-HD-3-MM 3 foot male-to-male HDMI video cable
- ✓ 1-100VAC to 240VAC at 50 or 60Hz-24VDC/2.5A AC Adapter
- ✓ 1- Power Cord- country specific
- ✓ 3 Foot IR-EMITTER (IR-EMTR-3)
- ✓ 3 Foot IR-RECEIVER (IR-RCVR-3)
- ✓ 1-CB4306 USB2-AB-1M-5T   1 meter USB 2.0 male type A-male type-B transparent cable
- ✓ CT6182 DB9 Female-to-RJ45 Female adapter
- ✓ CT6488 DB9 Male-to-RJ45 Female adapter
- ✓ 2-CB4352 5 foot RJ45-to-RJ45 CAT5 patch cable

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

- ➢ CAT5e solid 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 15 for proper EIA/TIA 568 B wiring method)

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.

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

- ➢ DVI-D male to HDMI-A male single link cable to connect a DVI source or display (Order NTI # DVI-HD-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.
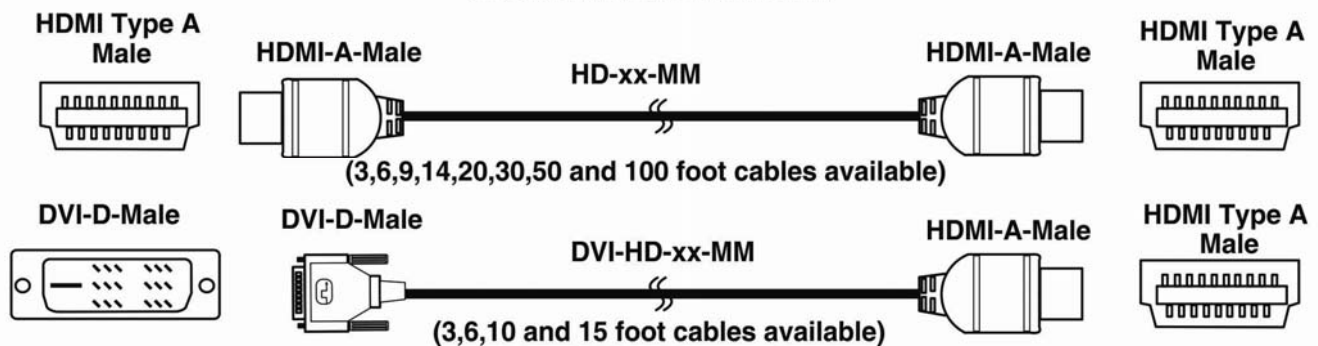
Front and Rear View of ST-C6USBHE-HDBT-L

Front and Rear View of ST-C6USBHE-HDBT-R

CONNECTORS AND LEDS

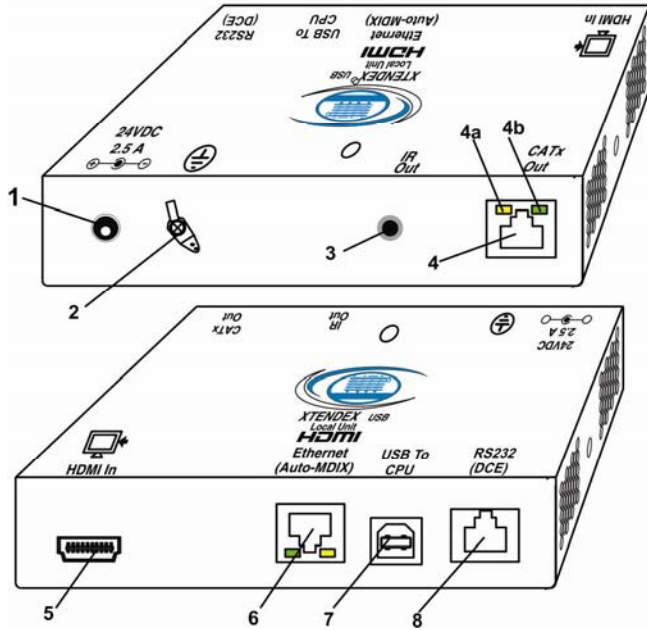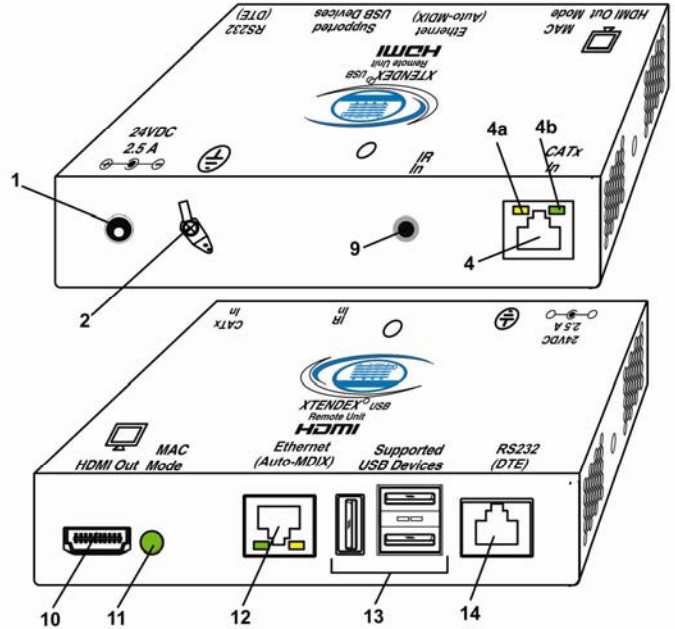| #	LABEL	CONNECTOR	DESCRIPTION
1	**24VDC- 2.5A**	1.0mm Power Jack	connection jack for the AC adapter (only the Local or the Remote Unit needs to be powered, <u>not both</u>)
2	**Ground**	Crimp and solder	For connecting earth ground to case
3	**IR Out**	3.5mm Stereo Jack	For connecting the IR Emitter
4	**CATx In**	RJ45 connector	for connecting the CAT5e/6/6a/7 cable between the Local and Remote units
4a	**Yellow LED**	--	**traffic indicator**- illuminates when there is communication between the local and remote units.
4b	**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 CPU
6	**Ethernet**	RJ45 connector	for connecting cable to either the LAN or an extended Ethernet connected device **(model with 100BaseT support only)**
7	**USB to CPU**	USB Type B	For connecting USB device cable from CPU
8	**RS232 (DCE)**	RJ45 connector	For connecting serial cable from CPU
9	**IR In**	3.5mm Stereo Jack	For connecting the IR Receiver
10	**HDMI Out**	HDMI female video connector	For connecting the remote display device
11	**MAC Mode**	Green LED	illuminates when configured to support the MAC one-button mouse
12	**Ethernet**	RJ45 connector	for connecting cable to either the LAN or an extended Ethernet connected device **(model with 100BaseT support only)**
13	**Supported USB Devices**	USB Type A Female	for connecting support USB devices (keyboard, mouse, CAC Card Reader, Whiteboard, Touchscreen Monitor)
14	**RS232 (DTE)**	RJ45 connector	For connecting serial cable to Touchscreen Monitor

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

LIMITATIONS

- The use of CAT5e or of any stranded cabling will reduce the maximum distance and resolution.
- When a USB printer is connected to the Remote Unit, if more than 3 pages are printed at a time or if the printer runs out of paper while printing, performance may become unreliable and the Remote Unit may need to be power-cycled to resume operation.
- A connected USB printer may take up to 1 minute to respond to a printing request.

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

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.

- Be very careful not to obstruct the air vents on the Remote Unit in its installed location.

 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.
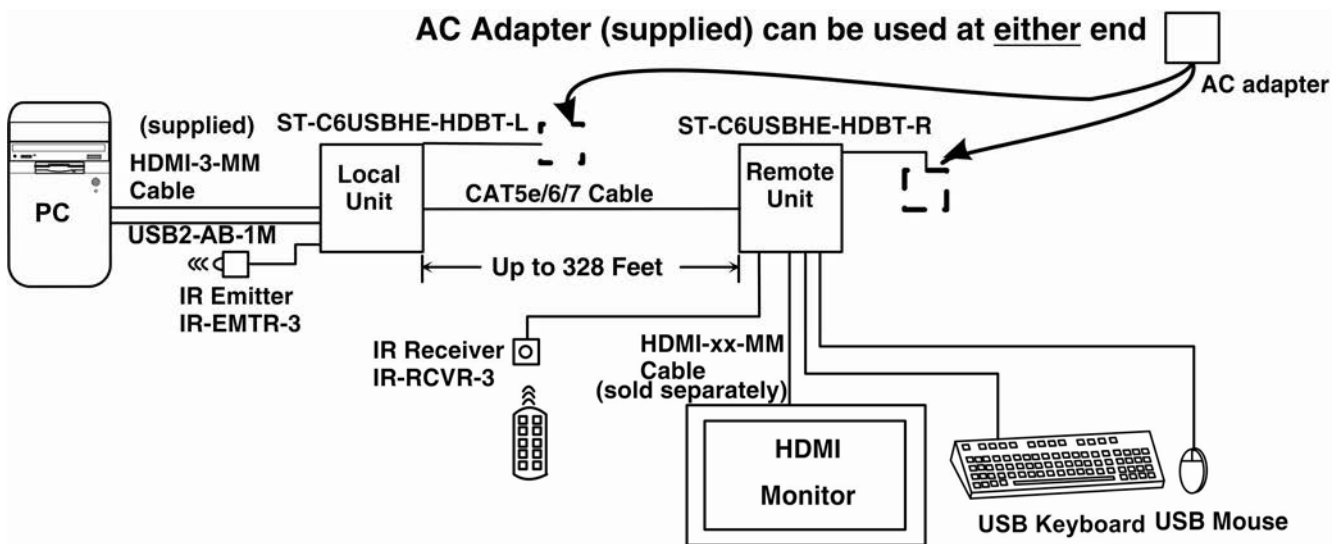
TYPICAL APPLICATION

INSTALLATION

Installing The Local Unit

1. Connect an HD-3-MM (supplied) or DVI-HD-xx-MM cable (page 2) between the CPU and the "HDMI In" connector on the Local Unit.
2. Connect a USB2-AB-1M cable (supplied) between a USB Type A port on a CPU and the "USB to CPU" USB Type B port on the Local Unit.
3. If the monitor has serial touchscreen support, connect the DB9F to RJ45 adapter to the CPU and a CATx patch cable between the adapter and the "RS232" port on the Local Unit.
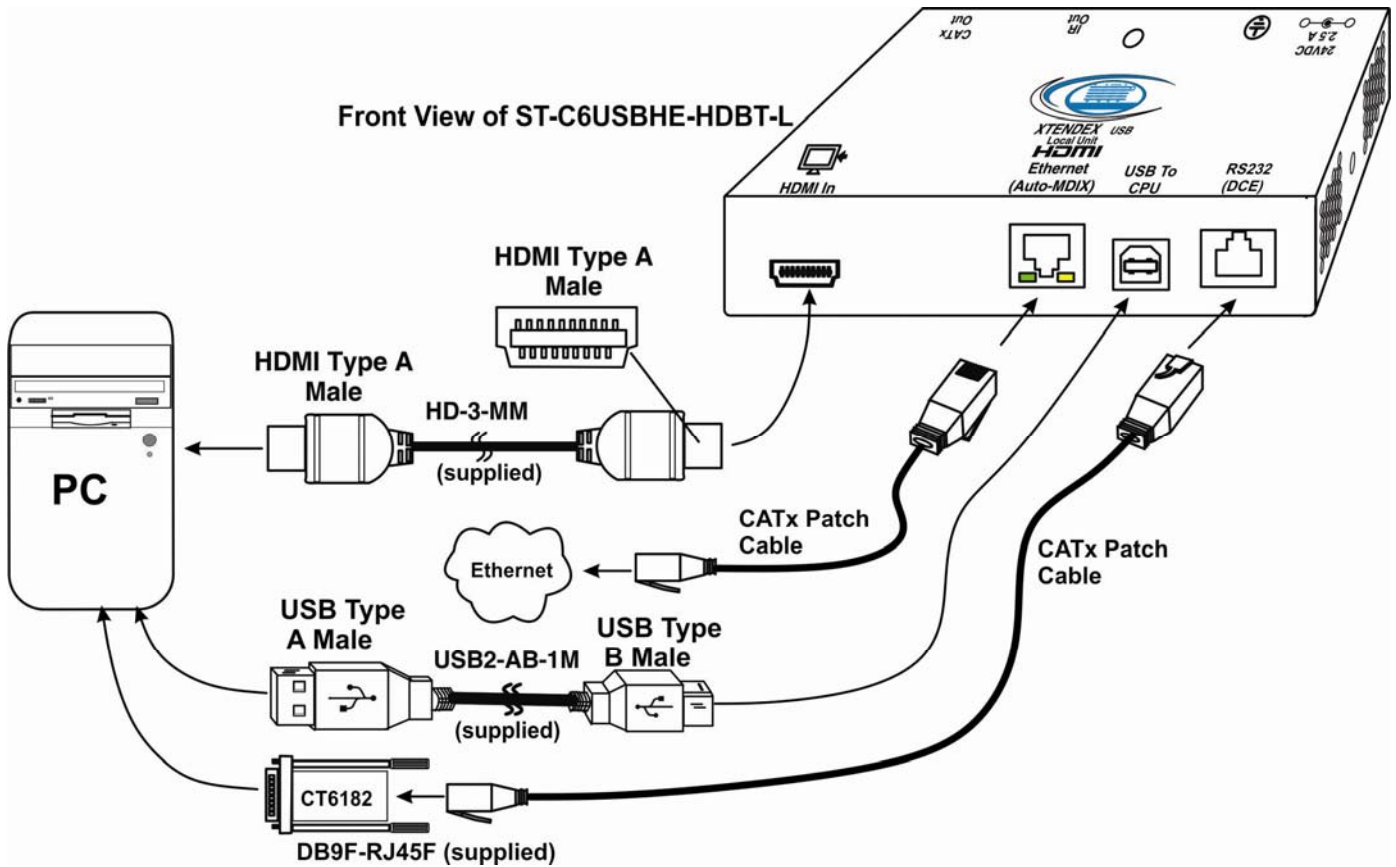
Figure 1- Connect the XTENDEX Local Unit to the computer

100BaseT Support Option

If the 100BaseT support option is present (ST-C6USBHE-HDBT only), the "Ethernet Port" can be used to extend a Local or Wide Area Network (LAN/WAN) connection. The Local or Remote unit can be used to connect a modem, router or switch or a network device (PC, printer, hub etc) If the network device is connected at the Local Unit, then the LAN/WAN connection must be at the Remote Unit, and visa versa. .

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 HD-xx-MM (or DVI-HD-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. Connect the keyboard, mouse, and any other supported device to the USB Type A connectors on the Remote Unit. Other supported devices include a touchscreen monitor, CAC card reader, interactive whiteboard or USB printer (requires firmware version 1.1 or later).
4. If the monitor has serial touchscreen support, connect the DB9M to RJ45 adapter (supplied) to the monitor and a CATx patch cable between the adapter and the "RS232" port on the Remote Unit.

Note: Be very careful that the installed location does not obstruct the air vents in Remote Unit case.
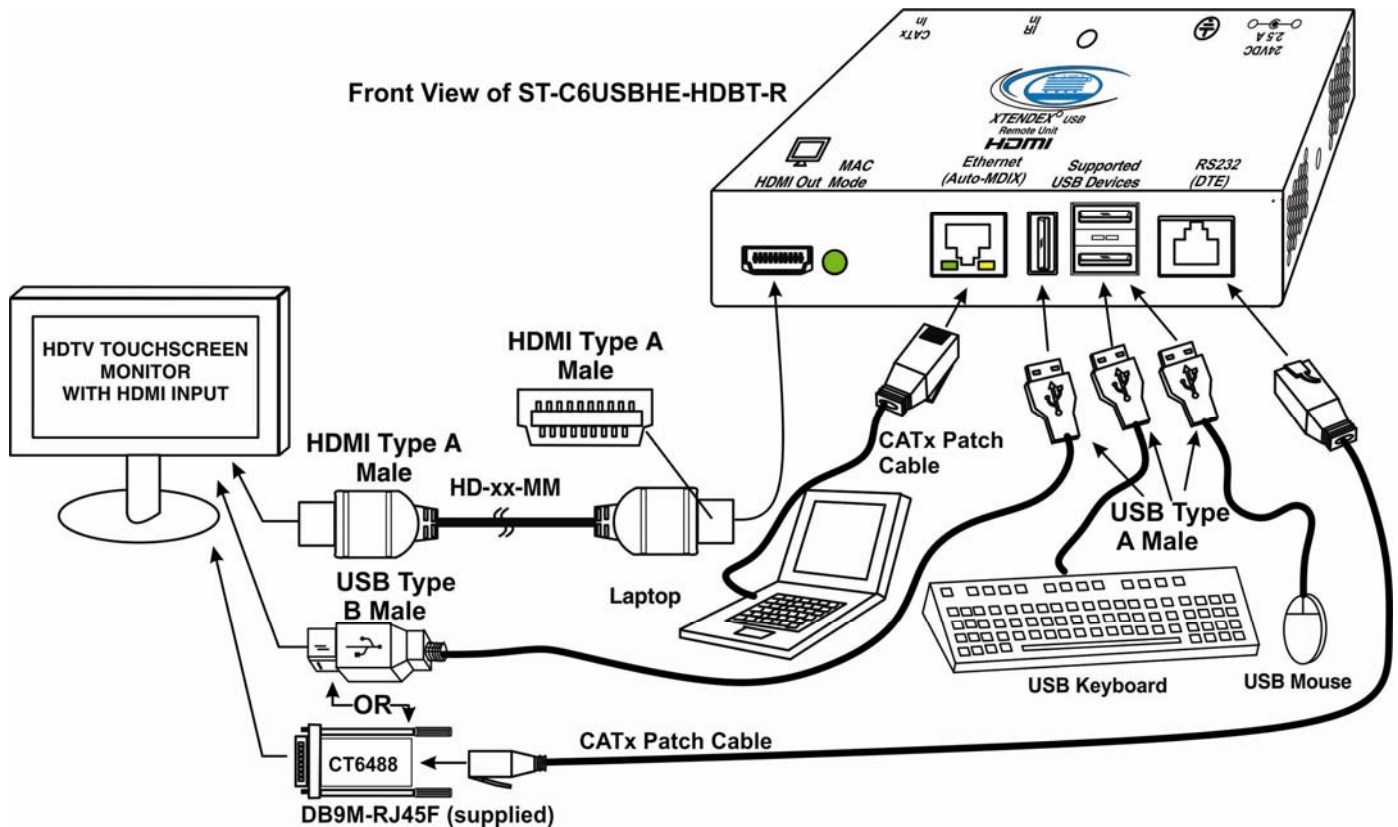
Figure 2- Connect the extended components to the Remote Unit

Note: When a USB printer is connected to the Remote Unit, if more than 3 pages are printed at a time or if the printer runs out of paper while printing, performance may become unreliable and the Remote Unit may need to be power-cycled to resume operation.

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

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.

Figure 3- Connect CATx cable

⚠️ *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.*

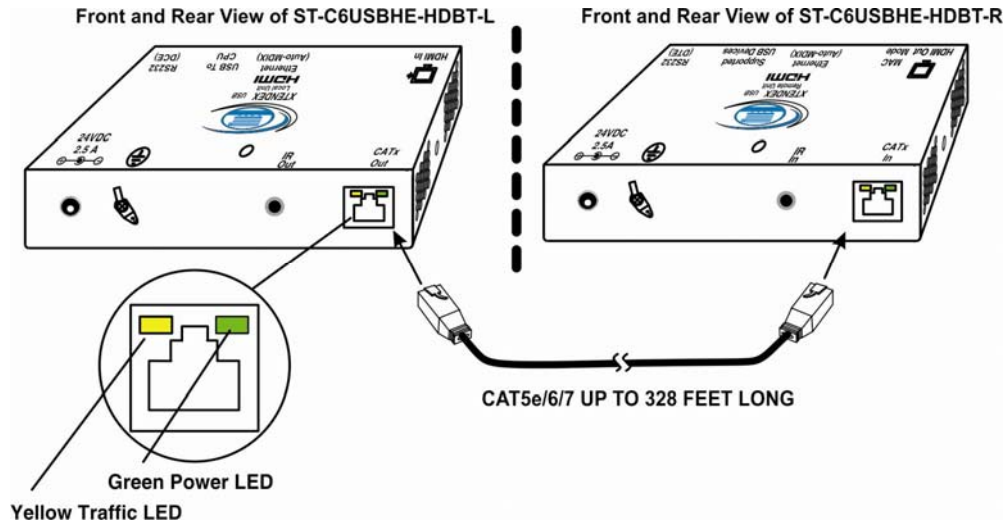*WARNING: The CATx connection cable used between NTI XTENDEX Series Local and Remote or any XTENDEX Series products must be wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.) The use of a CROSSOVER CABLE will damage the extender and void your warranty.*

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

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) The yellow LED will illuminate indicating communication between the Local and Remote units.

3. Turn ON the CPU and monitor.   The CPU and monitor 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
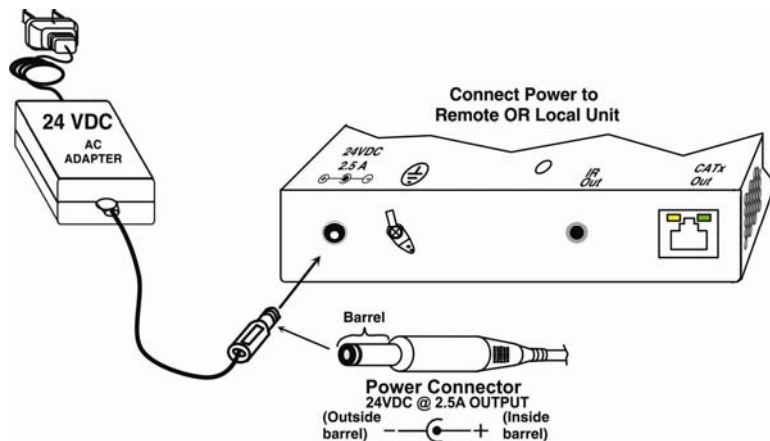
Figure 4- Connect the AC adapter to either the Remote Unit or the Local Unit

INFRARED CONTROL

The XTENDEX includes ports for connecting an infrared emitter and receiver (included) to work in conjunction with the IR remote control used to operate the signal source.   Connect the receiver to the "IR IN" port on the Remote Unit and the emitter to the "IR OUT" port on the Local unit.   Position the end of the receiver such that the signal from the remote control can easily reach the IR sensor.   Position the end of the emitter such that the extended signal can be sent to the signal source.

Note: The IR Emitter and Receiver work within a frequency range of 30-50kHz.   Check the specifications for the device you are extending to make sure the XTENDEX will work with it.

Figure 5- Connect IR Emitter and Receiver

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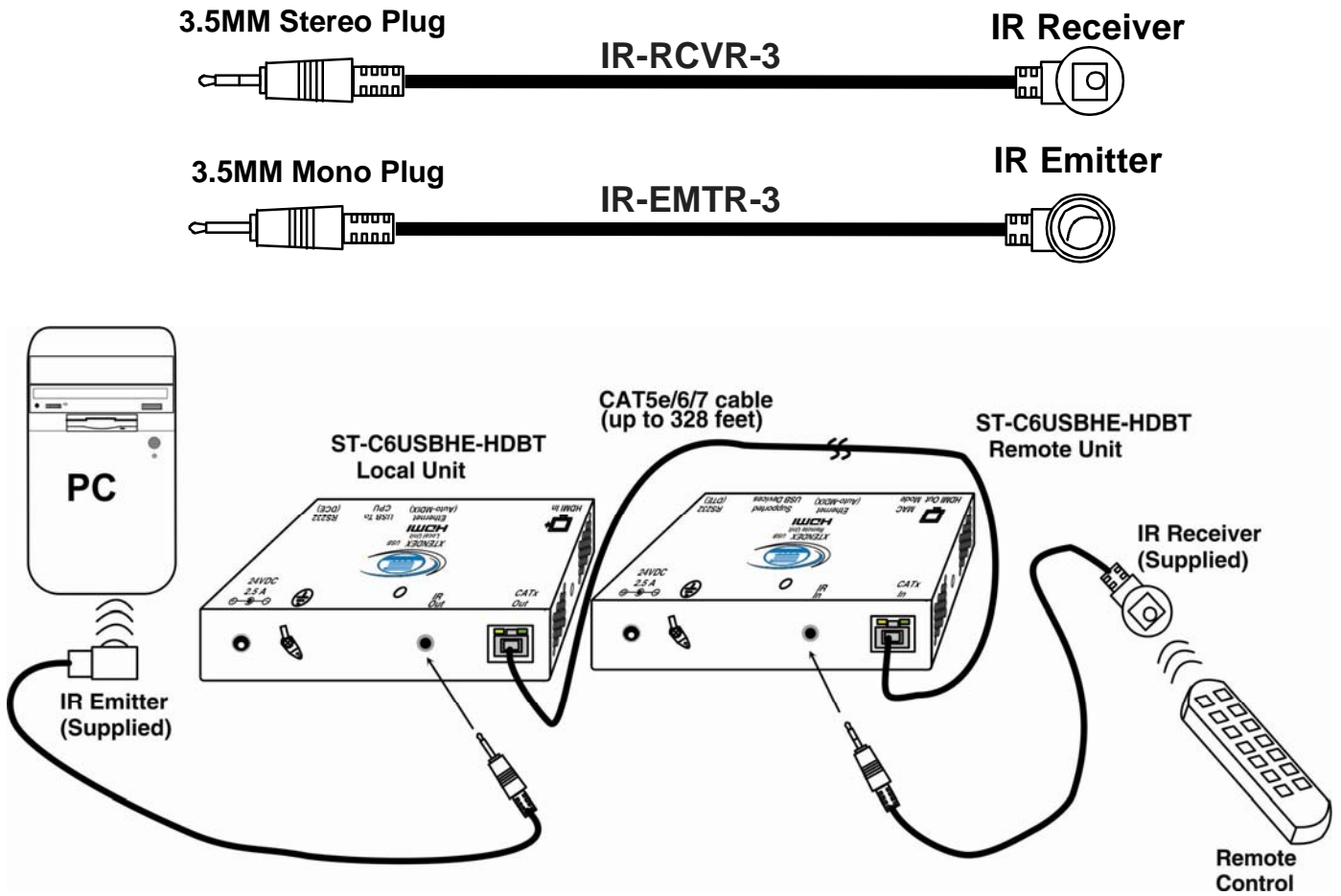
NOTE: When the port is connected to a PC or SUN CPU, MAC Mode should be OFF (the default setting).

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 6)
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.
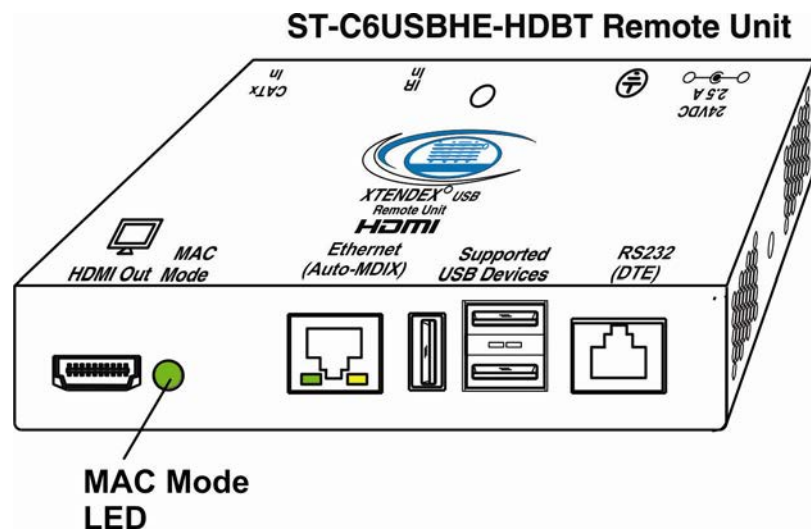4. Press `<Esc>` at any time to exit Command Mode.

Figure 6- MAC Mode LED

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

FIRMWARE UPGRADE PROCEDURE

This procedure describes how to upgrade the firmware in this XTENDEX. If you are not certain whether this XTENDEX has the most up-to-date firmware available, simply download the latest version and follow the upgrade procedure.   All versions of firmware can be downloaded from http://www.networktechinc.com/hdmi-usbkvm-hdbt.html.

The XTENDEX has 3 types of micro-controllers:

1. Local Controller – the Local Controller will be upgraded with a binary file named **c6usbhe-lcs*x-x*.bin. (where x-x is the rev number)**
2. Local Port Controller – the Local Port Controller will be upgraded with a hex file named **c6usbhe-lcp*x-x*.hex.**
3. Remote Controller – the Remote Controller will be upgraded with a binary file named **c6usbvhe-rcs*x-x*.bin**.

The XTENDEX firmware has a bootloader which can be used for firmware upgrades. The bootloader resides in a protected area of Flash memory, so that if the upgrade fails for any reason, the bootloader will still be available to be used to re-program the entire unit.

Upgrades are made to the Local Controller, Local Port Controller or Remote Controller separately.   Not all Controller firmware is updated with each revision, however it is highly recommended that if you upgrade one piece of firmware, you upgrade each controller segment to make sure your Local and Remote are both at current versions.

Requirements

➢   CAT5 Patch Cable (supplied with XTENDEX)

➢   RJ45-DB9 Adapter (supplied with XTENDEX)

➢   Computer with a Terminal Console (for example, HyperTerminal in Windows, or any similar program able to send files using Xmodem protocol)

➢   Firmware files for the XTENDEX on the computer with the Terminal Console.

Prepare to Upgrade the Firmware

With the power to the PC and XTENDEX OFF, connect a PC to the XTENDEX using the supplied 5 foot patch cable and 9DB-to-RJ45 adapter.   Connect the patch cable to the "FIRMWARE UPGRADE" port on the Local Unit, attach the supplied DB9F-to-RJ45 adapter to the patch cable, and connect the DB9 adapter to an available COM port on the PC.
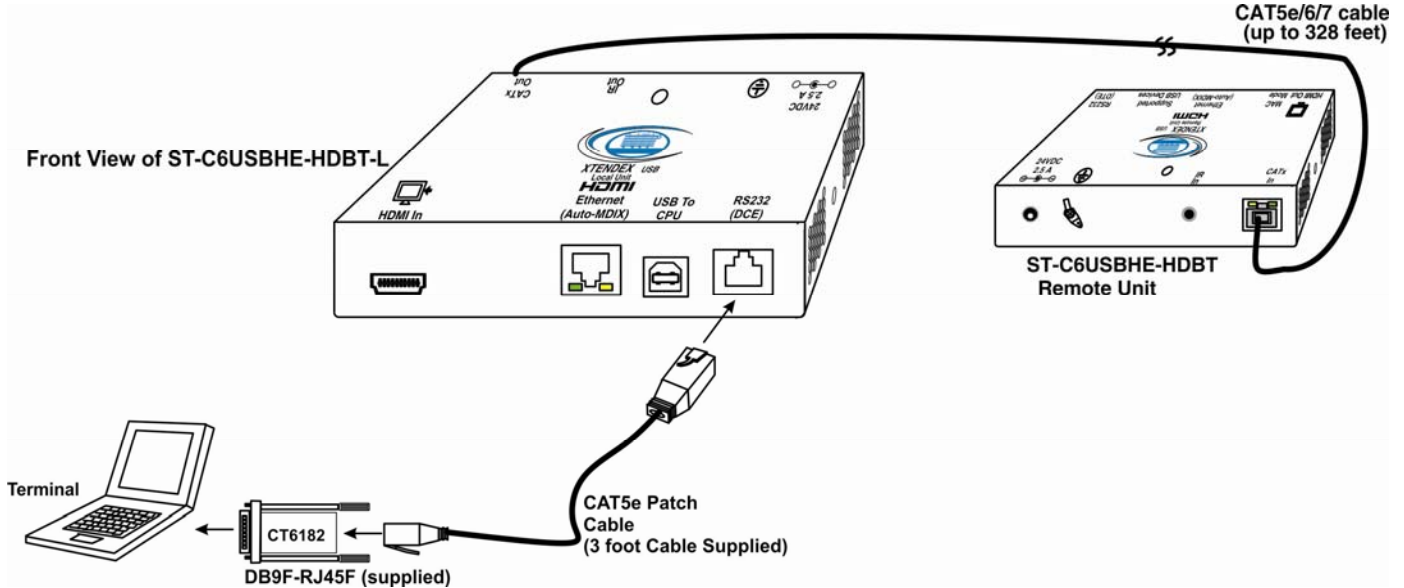
Figure 7- Connect PC for firmware upgrade

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

2. Power ON the computer only.   Open the terminal console and apply the following settings to the terminal console for the port connected to the XTENDEX:

        Baud rate: 57600

        Data bits: 8

        Parity: none

        Stop bits: 1

        Flow control: none

Upgrade Procedures

Upgrade the Local Controller Firmware

The Local controller firmware comes as a file in binary format and has the extension .bin. (i.e. filename.bin). To upgrade the Local controller to this file, follow this procedure:

1. While In the HyperTerminal window on the attached computer, press **and hold** the **<Tab>** key on the keyboard
2. Connect the power supply to power ON the Local Unit. The following message (or one similar) will be displayed on the screen:

```
ST-C5-USBVA Bootloader
Revision: 1.6
Date: 2010/02/19 18:59:15
Copyright (C) 2010 Network Technologies Inc

Press <H> for help…
>
```

3. Release the **<Tab>** key.

The "**>**" prompt indicates that the bootloader is waiting for commands. The available commands are composed by sending one ASCII character. To send a command to the bootloader, type the key in the terminal window that corresponds to the desired command. The available commands, listed below, can be viewed by typing **<h>** or **<H>** (the Help command) from the keyboard.

Note: Commands can be typed using upper or lower case letters.

Local Bootloader List of Commands:

h, H - Display list of commands
x, X - Exit Bootloader
u, U - Upgrade Local controller firmware
p, P - Upgrade Local port controller firmware
r, R - Upgrade Remote controller firmware
s, S - Read Checksum of the Local port controller firmware

Characters "r" and "s" from the Local Bootloader command list are not used in this product.

To proceed to upgrade the Local controller, press **<u>** from Terminal window. The following message should appear on the screen:

```
 Erasing flash memory…
 Memory successfully erased
Send .bin file using Xmodem protocol..
```

At this point the binary file **c6usbhe-lcs*x-x*.bin** must be sent. To do this, from HyperTerminal:

       1. go to "Transfer" menu in the Menu Bar of the HyperTerminal window

       2. click the item "Send File …"

       3. in the dialog box which pops up on the screen, browse for the file to be sent and select it

       4. select "Xmodem" from the Protocol drop-down menu

       5. press "Send" button

The transmission will start shortly. Wait until the transmission is finished. There will be some pauses during transmission, since the processor writes blocks of 4KB.

When the transmission is complete, the HyperTerminal window should show the following status message and return to the menu prompt:

```
Device successfully programmed!

>
```

Press **<x>** to exit the Local Bootloader, or continue with upgrading the Local Port Controller firmware (next page).

Upgrade the Local Port Controller Firmware

The Local port controller firmware comes as a file in Intel Hex format and has the extension .hex (i.e. filename.hex). To upgrade the Local Port controller with this firmware, press **<p>** from the terminal window. The following message should appear on the screen:

Send .hex file using XModem protocol...

At this point, the hex format file **c6usbhe-lcp*x-x*.hex** has to be sent, using HyperTerminal and the same procedure as before. When the transmission is done, the following message will be shown in the HyperTerminal window:

File transfer OK!
Please, type <A> to program chip or <X> to exit

To program the chip, just press **<a>**).

The following message will be shown on the screen (it may take about 12 seconds to program):

Programming device, please wait...

Device ID: 0x001E
Device successfully programmed!

To exit from the Local Bootloader, press **<x>**. (To upgrade the Remote Controller Firmware, you **need** to exit from the Local Bootloader.)

Upgrade the Remote Controller Firmware

The Remote controller firmware comes as a file in binary format and has the extension .bin. (i.e. filename.bin). To upgrade the Remote controller to this file, follow this procedure:

1. **With the power supply still connected to the Local Unit**, unplug the CAT6 cable between the Local and Remote Unit.

2. Press **and hold** the **<Tab>** key on the keyboard while in the HyperTerminal window

3. Plug the CAT6 cable back in (reconnecting the Local and Remote Unit). The following message should appear on the screen:

ST-C5-USBVA Bootloader
Revision: 1.5
Date: 2013/02/06 10:09:15
Copyright (C) 2010,2013 Network Technologies Inc

Press <H> for help…
>

4. Release the **<Tab>** key.

The "**>**" prompt indicates that the bootloader is waiting for commands. The available commands are composed by sending one ASCII character. To send a command to the bootloader, type the key in the terminal window that corresponds to the desired command. The available commands, listed below, can be viewed by typing **<h>** or **<H>** (the Help command) from the keyboard.

Note: Commands can be typed using upper or lower case letters.

Remote Bootloader List of Commands:

h, H - Display list of commands
x, X - Exit Bootloader
r, R - Upgrade Remote controller firmware

To proceed to upgrade the Remote controller, press **<r>** from Terminal window. The following message should appear on the screen:

 Erasing flash memory…
 Memory successfully erased
Send .bin file using Xmodem protocol..

At this point the binary file **c6usbhe-rcs*x-x*.bin** must be sent. To do this, from HyperTerminal:

      1. go to "Transfer" menu in the Menu Bar of the HyperTerminal window

      2. click the item "Send File …"

      3. in the dialog box which pops up on the screen, browse for the file to be sent and select it

      4. select "Xmodem" from the Protocol drop-down menu

      5. press "Send" button

The transmission will start shortly. Wait until the transmission is finished. There will be some pauses during transmission, since the processor writes blocks of 4KB.

When the transmission is complete, the HyperTerminal window should show the following status message and return to the menu prompt:

Device successfully programmed!

>

To exit from the bootloader, press **<x>**.

TECHNICAL SPECIFICATIONS

Video	
Video Compatibility	HDTV resolution up to 1080p @60Hz
Video Connectors	HDMI Type A Female
Bandwidth	154 MHz (3.76Gbps)
Input Video Signal	TMDS
HDMI Version	HDMI 1.2
DVI Support	DVI 1.0
DDC Support	DDC2b
HDCP Version	HDCP 1.2
Audio	
Audio Format	LPCM,Dolby Digital (AC3)(Plus),DTS, Dolby TrueHD,DTS-HD Master Audio
IR	
Input/Output	3.5mm Stereo Jack
Signal Type	TTL, 0-5VDC
Input Impedance	1.5k ohm
Output Impedance	33 ohm
Maximum Input/Output Level	5.2 Vp-p
Frequency Range	30-50kHz
Maximum Distance (from receiver)	10 feet, straight; 5 feet at 45 degree angle
General	
Interconnect Cable	CAT5e solid UTP; CAT6/6a Solid UTP; CAT7 Solid STP EIA/TIA 568 B wiring with male RJ45 connectors
CATx Cable Range	328 ft maximum
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/2.5A via AC Adapter
Enclosure type	Electro-galvanized steel black powder coated
Size (In.) WxDxH	6.06x3.05x1.08
Compliance Certifications	CE, RoHS

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
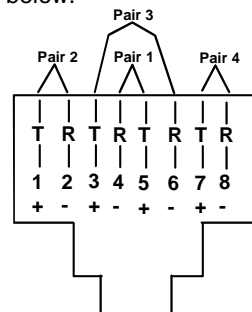
Figure 8- View looking into RJ45 female

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.

Distances for CAT5e/CAT6/CAT6a and CAT7 Cables tested to 1080p

CATx	Type	AWG	DISTANCE (feet)
CAT5e	Solid UTP	24	300
	Stranded UTP	24	200
	Solid STP	24	250
	Stranded STP	24	250
CAT6	Solid UTP	23	328
	Stranded UTP	24	200
	Solid STP	23	328
	Stranded STP	24	150
CAT6a	Solid UTP	23	328
CAT7	Solid STP	23	328
	Stranded STP	26	300

Note: Results may vary with cable quality
Recommended: Use Solid 23AWG Cat6 or better cable for best results

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, a solution may be found in the knowledgebase on our website at http://information.networktechinc.com/jive/kbindex.jspa or please call us directly at (**800) 742-8324 (800-RGB-TECH)** or **(330) 562-7070** and 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 (maximum length is 328 feet)
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 (maximum length is 328 feet) • 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 (maximum length is 328 feet). • Switch to shorter cable

WARNING: If the CATx IN or CATx OUT ports of a powered Remote or Local extender are connected to the RS232 port of another Remote or Local unit, the CATx port will be damaged and render the XTENDEX unusable and void the warranty.

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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