NETWORK
TECHNOLOGIES
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VOPEX® Series

VOPEX-USBH(A)-2/4
DVI/HDMI USB KVM Splitter with Built-in Hub
Installation and Operation Manual

Front and Rear View of VOPEX-USBH-2

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

TRADEMARK

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CHANGES

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INTRODUCTION

The VOPEX-USBH-2 (VOPEX) is a DVI/HDMI and USB KVM Splitter and 3-Port Hub. It enables the control of one USB enabled CPU through two separate USB keyboards, USB mice, and DVI or HDMI monitors and it enables the connection of 3 additional USB devices (other than keyboards or mice). Each user is able to have complete control of a CPU (although it is not recommended to access the CPU more than one at a time as unpredictable results may occur).   While the user access is controlled by three (3) separate modes of operation, both user monitors will show the same image at all times. The 3 hub ports (for printer, scanner, camera, etc.) will be connected to the CPU at all times.

Options:

- A 4-port model (VOPEX-USBH-**4**) is available supporting up to 4 users.
- Models with stereo audio support are available. Just add "A" to the part number (i.e. VOPEX-USBH**A**-4)

Types of User Input Devices Supported:
- USB keyboard with Windows layout
- USB keyboard with SUN layout
- USB keyboard with MAC layout
- USB Mouse - (up to 3 buttons)
- USB IntelliMouse (scroll wheel)
- Mouse-Trak trackball
- Logitech, Kensington and Microsoft Wheelmouse or Trackball on Mac CPUs with special drivers
- Logitech Cordless Elite Duo keyboard and mouse
- Crystal Vision keyboard with touchpad
- Gyration keyboard/mouse
- NTI USB-PS/2 Adapter
- NTI USB-SUN Adapter

Types of Shared Devices Supported:

- Both low-speed and full speed USB devices are supported.
- USB 1.1 (low/full speed) standards.

Video Support:
- Compliant with HDMI 1.2, HDCP 1.1 and DVI 1.0 standards. Plug-n-Play specification supported
- Supports HDMI CEC
- Supports HDTV resolutions up to 1080i and computer resolutions up to 1920x1200.

Types of CPUs Supported:
Any USB CPU supporting USB version 1.0 or above including:

- USB WINxx
- USB MAC
- USB SUN

NTI Extenders Supported:

- ST-C6USBH-300 300 Foot HDMI USB KVM Extender
- ST-C6USBH-HDBT 328 Foot HDMI USB KVM Extender over HDBase-T

Audio Option:

- 3.5mm stereo audio jacks.
- Frequency response: 20 Hz to 20 kHz +/- 1dB.
- Total harmonic distortion (THD): 0.012%.
- Stereo crosstalk: -82 dB.
- Input impedance: 10k Ohms.
- CD quality audio output.
- Requires powered speakers.

LIMITATIONS

- The USB ports on the VOPEX are USB 1.1 compatible. Any USB 2.0 device connected to the VOPEX will be regulated to USB 1.1 speeds.

MATERIALS

Materials included with this kit:
- VOPEX-USBH-2/4 2/4-Port DVI/HDMI USB KVM Splitter
- USB-AB-1M-ST 1 Meter Transparent USB A-B Device Cable
- DVI-HDMI-3-MM   3' M-M DVI-to-HDMI Video Cable
- SA-3-MM 3' Stereo Audio Cable (models with stereo audio support only)
- 120 or 240VAC @ 50 or 60Hz-5VDC/3.0A AC Adapter (2-Port Model)
                    or
- 120 or 240VAC @ 50 or 60Hz-5VDC/6.0A AC Adapter (4-Port Model)
- This manual

CONNECTORS AND LEDS
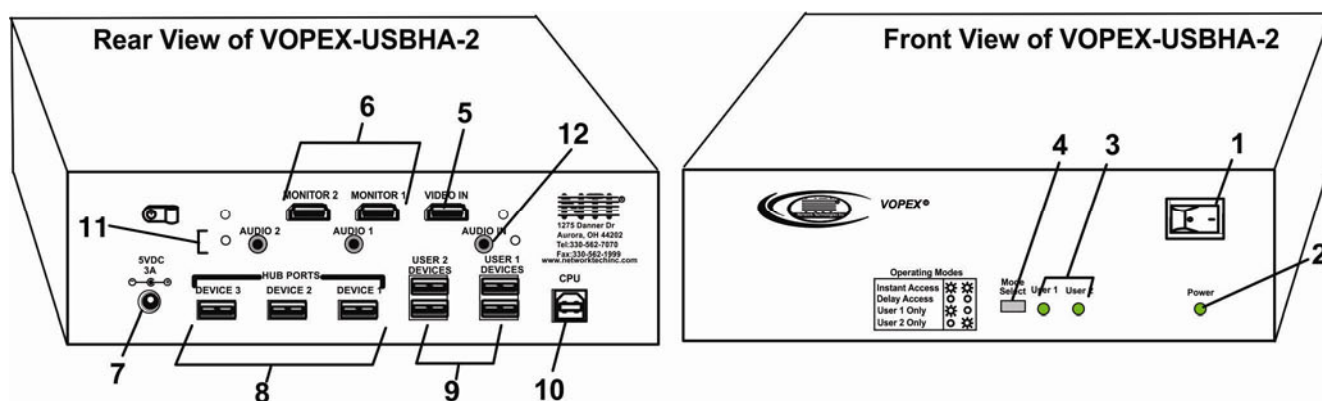
#	LABEL	CONNECTOR/LED	DESCRIPTION
1	I / O	Power Switch	To power up or power down the VOPEX
2	Power	Green LED	Illuminates to indicate proper power to the unit
3	User x	Green LED	For visual indication of the splitter's operating mode
4	Mode Select	Push Button	Press to manually switch between operating modes
5	VIDEO IN	HDMI Type A female	for connecting the video cable from the CPU
6	MONITOR x	HDMI Type A female	for connection of the user video monitors
7	5VDC 3.0A	2.1x5.5mm Power Jack	for connection of power supply
8	HUB PORTS	USB type A female	for connection of the cables from USB devices
9	USER x DEVICES	USB type A female	for connection of user USB device(s) (keyboard and mouse)
10	CPU	USB type B female	for connection of the devices cable from the CPU
11	AUDIO x	3.5mm Stereo Audio jacks	for connecting audio cable to self-powered stereo speakers (models with audio support only)
12	AUDIO IN	3.5mm Stereo Audio jacks	for connecting audio cable from audio source (models with audio support only)

INSTALLATION

FYI: It is not necessary to disconnect power to the CPU and monitor(s) before installation.

Monitor Connection

1. Disconnect the monitor cable at the CPU and reconnect it to the "MONITOR 1" port on the VOPEX. (See Fig. 1)

    (A second DVI-HDMI-x-MM cable may be required (sold separately)- one has been supplied for connection to the CPU.)

2. Plug a second monitor into the "MONITOR 2" port on the VOPEX.

Mouse Connection

1. Disconnect the mouse at the CPU and reconnect it to one of the female USB type A 'USER 1 DEVICES" ports on the VOPEX.

2. Connect a second mouse (or optional USB extension cable NTI USB-A+A-5M) to the female USB type A "USER 2 DEVICES" ports on the VOPEX.

Keyboard Connection

1. Disconnect the keyboard at the CPU and reconnect the keyboard to the remaining female USB type A "USER 1 DEVICES" port on the VOPEX.

2. Connect a second keyboard (or optional USB extension cable NTI USB-A+A-5M) to the remaining female USB type A "USER 2 DEVICES" ports on the VOPEX.
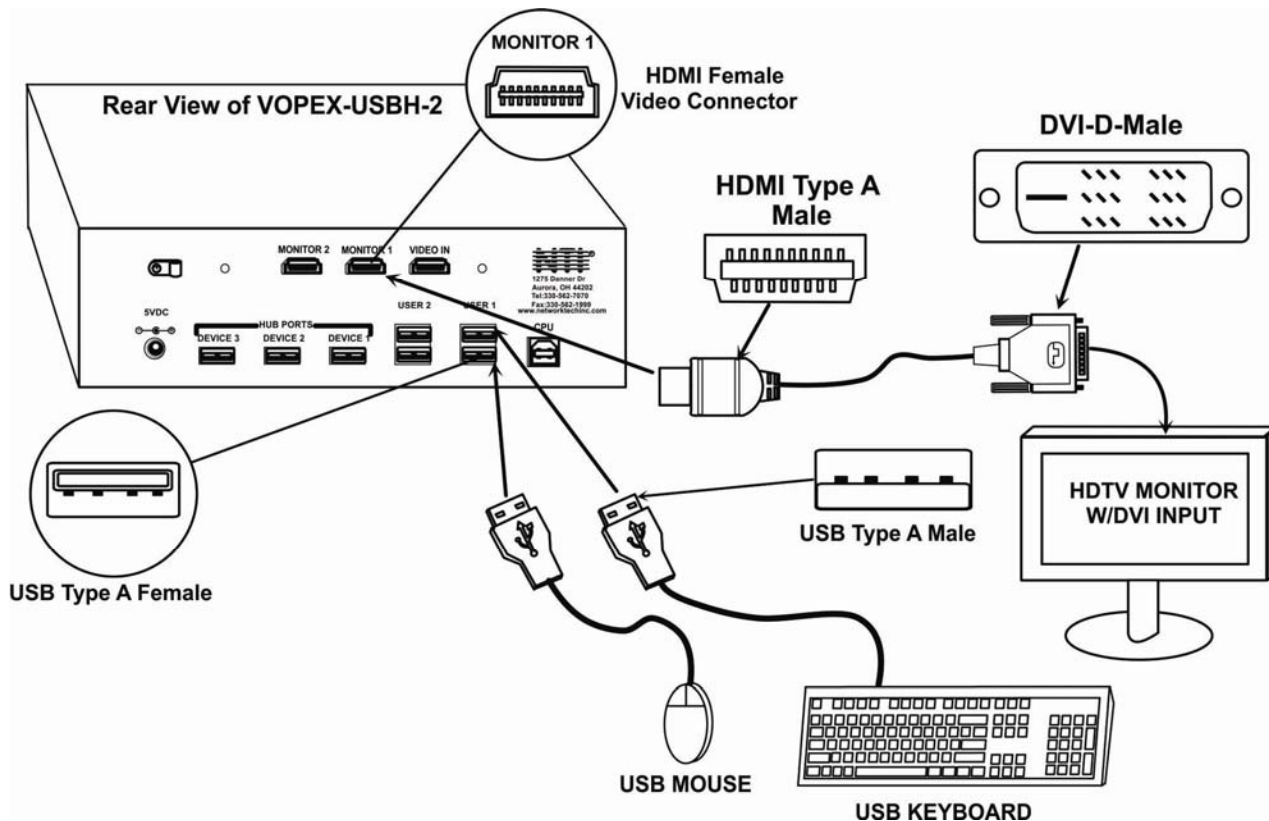
Figure 1- Connect User 1 Keyboard, Mouse, and Monitor

CPU Connection

1. Connect the male USB type A connector end of the USB-AB-1M-ST cable into the device port on the CPU.

2. Connect the male USB type B connector of the same cable to the "CPU" port on the VOPEX.

3. Connect the male DVI-D connector end of the DVI-HDMI-3-MM into the CPU's video port. (See Fig. 2)

4. Connect the male HDMI connector end of the DVI-HDMI-3-MM into the "VIDEO" port on the VOPEX.
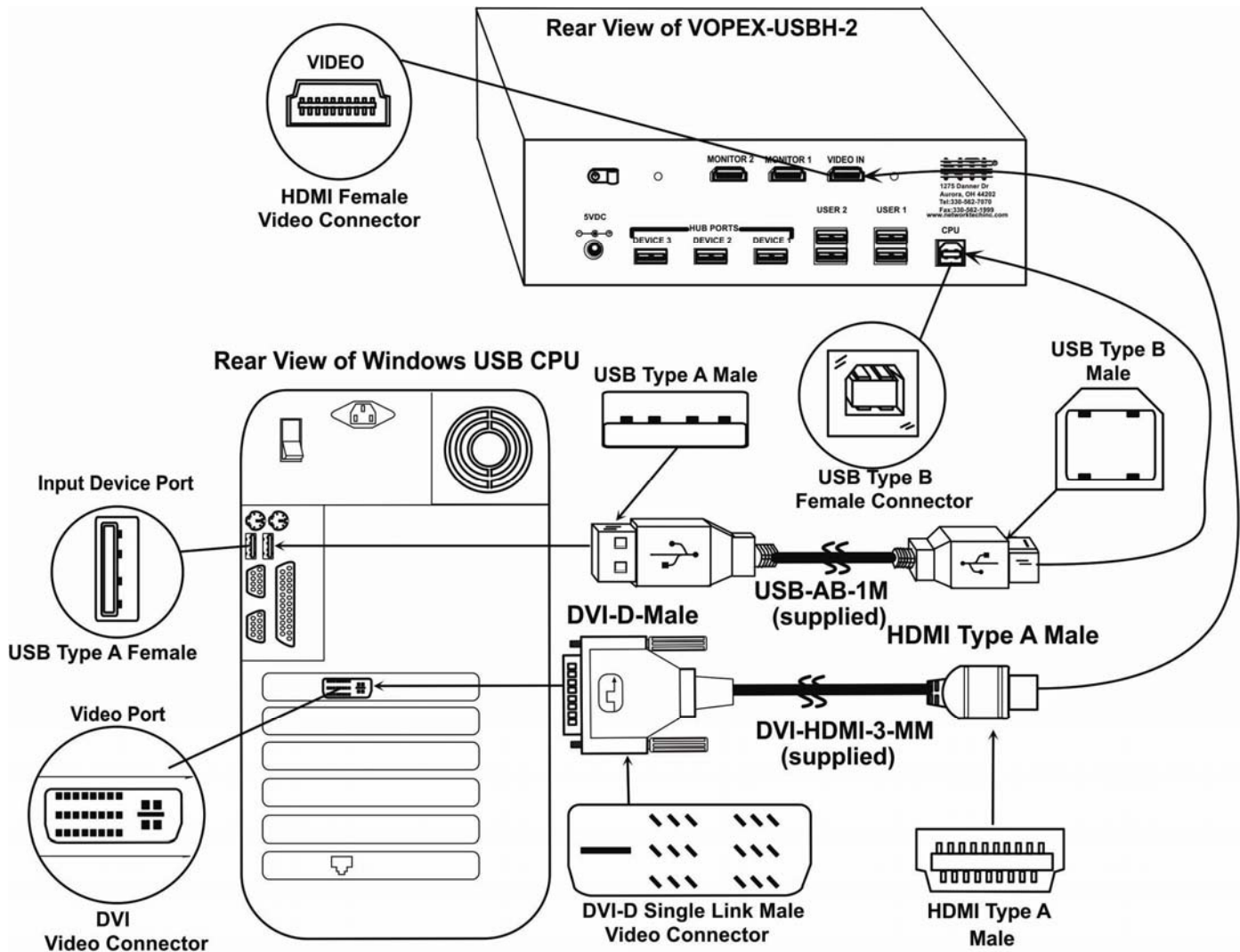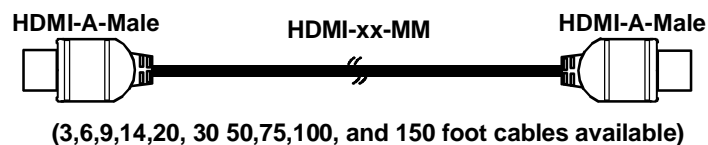

Figure 2- Connect the VOPEX to the CPU

*Note: If your CPU has an HDMI video port instead of DVI, an HDMI-xx-MM cable can be purchased separately from NTI.
Contact your NTI salesperson or visit our web site at http://www.networktechinc.com for details.*

(3,6,9,14,20, 30 50,75,100, and 150 foot cables available)
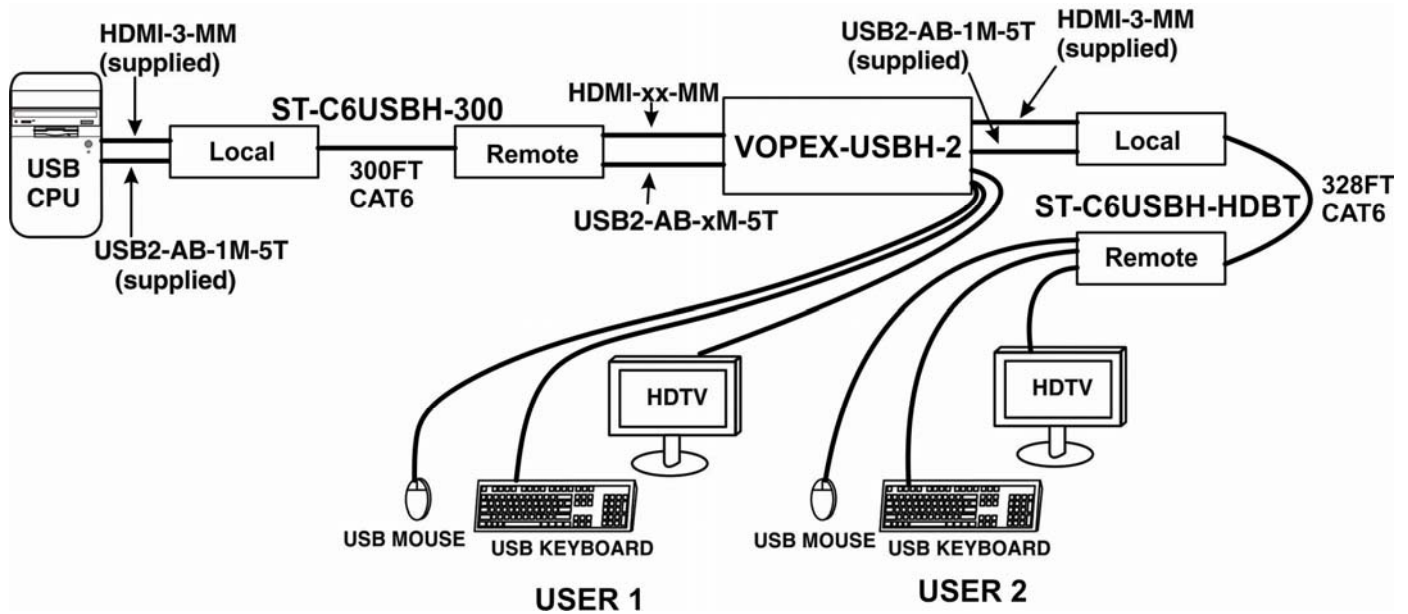
Figure 3- Example of configuration with HDMI extenders on input and output

Hub Ports

If desired, connect additional USB devices to each of the three "Hub Ports". These ports will be powered and operational anytime the VOPEX and CPU are powered ON. See Fig. 3.
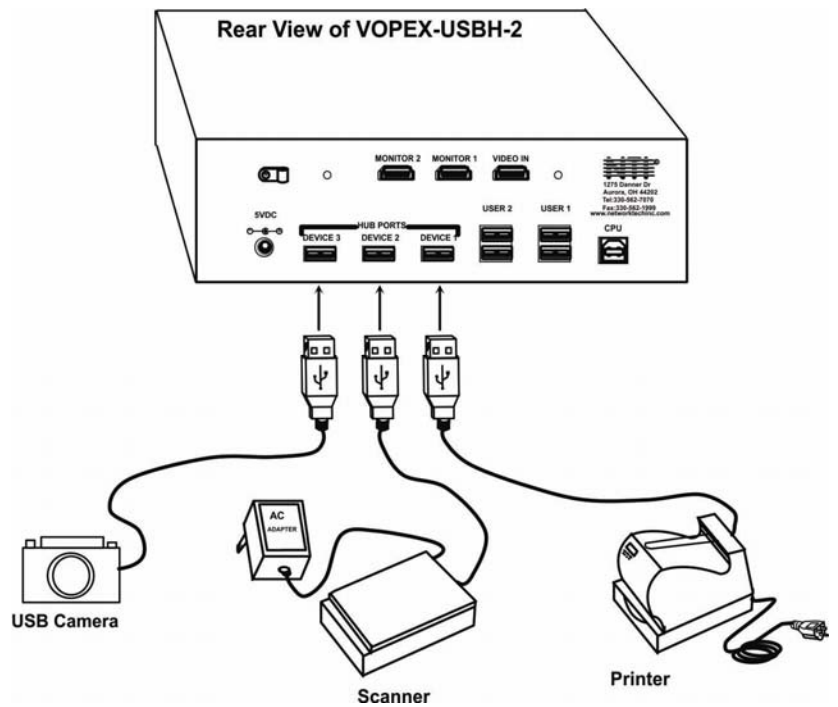
Figure 4- Connect other devices to Hub Ports

Power-Up

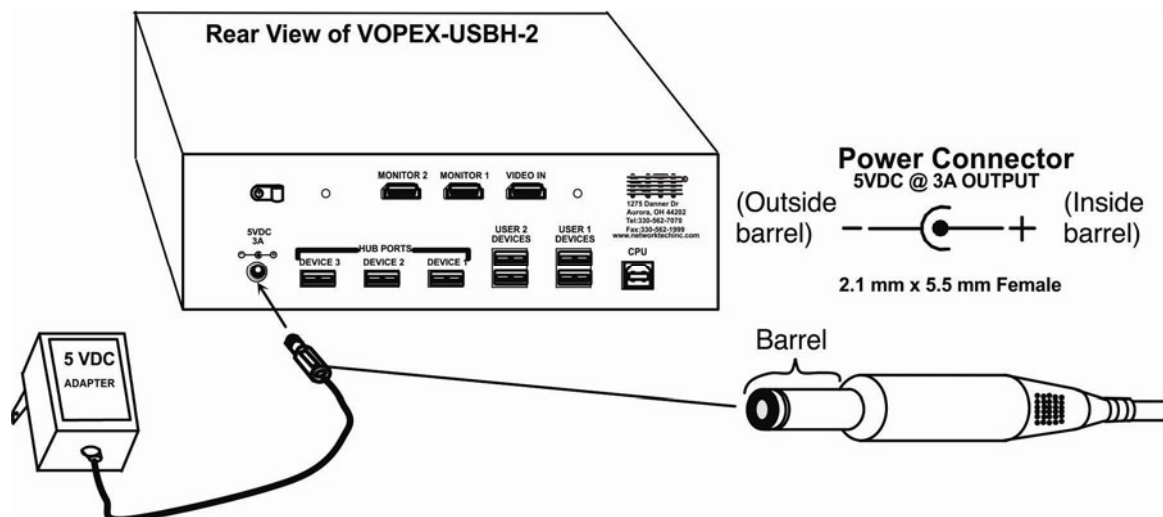Connect the AC adapter to the VOPEX and power ON the VOPEX.   If not already ON, power ON the CPU and monitors.

Figure 5- Connect the AC adapter to the VOPEX

OPERATION

Mode Selection
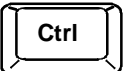
The VOPEX comes equipped with three (3) modes of operation- INSTANT AUTO, DELAYED AUTO, and USERx. To manually toggle between modes, depress the MODE button once each time a mode change is desired. Select the mode according to the chart below.

MODE	DESCRIPTION	INDICATOR LEDS 2-Port	INDICATOR LEDS 4-Port
INSTANTANEOUS	All users have control of the CPU simultaneously.	U1 ☀ U2 ☀	U1 ☀ U2 ☀ U3 ☀ U4 ☀
DELAY	The first user with an active device gets control of CPU. The second user is locked out until after 5 seconds of inactivity from the first user.	U1 ○ U2 ○	U1 ○ U2 ○ U3 ○ U4 ○
USER 1	"USER 1" has sole access. Other users are locked out.	U1 ☀ U2 ○	U1 ☀ U2 ○ U3 ○ U4 ○
USER 2	"USER 2" has sole access. Other users are locked out.	U1 ○ U2 ☀	U1 ○ U2 ☀ U3 ○ U4 ○
USER 3	"USER 3" has sole access. Other users are locked out.	------	U1 ○ U2 ○ U3 ☀ U4 ○
USER 4	"USER 4" has sole access. Other users are locked out.	------	U1 ○ U2 ○ U3 ○ U4 ☀

Note: In Instantaneous Mode all users have control of the CPU simultaneously, but it is recommended that only one user take control at a time. Movements from multiple mice at the same time will cause unpredictable movements on the monitor.

Keyboard Command Mode

In order to control the other features of the VOPEX with the keyboard, Command Mode must be enabled. To enter Command Mode from the keyboard:

Press   [**Ctrl**]   **+**   [~ `]   **(ACCENT KEY)**

When the Command Mode is enabled, all 3 status lights on the keyboard will illuminate and both LED's on the VOPEX will blink continuously to indicate Command Mode is enabled. See the table below for functions that are available while in Command Mode.

NOTE: The user must exit Command Mode in order for the CPU to switch to the selected mode. To exit Command Mode, press ESC on the keyboard. The mouse will not operate while in Command Mode.

NOTE: While in Command Mode, when a proper programming command is entered and is recognized by the switch, the hiLED's on the keyboard will flash once to indicate acceptance. The user must exit Command Mode (by pressing ESC) to see a change take effect in the switch operation.

NOTE: The VOPEX will automatically exit Command Mode after 5 seconds of inactivity by the user if the user does not manually exit Command Mode.

The following functions exist while in Command Mode:

Key Combination	Description of Function
<X>-<key>-<Y>	Select a new key sequence to use to enter Command Mode – Replace <key> with the desired key to follow <Ctrl> with.
<L> - <x> - <x>	Select the country code of the keyboard being used with a USB SUN CPU (see *Country Codes* chart below)
<V> - <Enter>	This will print the version of the code in the VOPEX to a text editor window (i.e. Windows Notepad) for use when troubleshooting the VOPEX. **Note**: The text editor should be open prior to entering Command Mode.
<M>	Configure the CPU port to connect to a MAC CPU (see "Mice and Trackballs with MACs" below.)
<W>	Configure the CPU port to connect to a Windows or SUN CPU
<D> - <x>	Select the operating mode, x=1 for Instantaneous Mode, x=2 for Delay Mode, x=3 User 1Mode, x=4 for User 2 mode. x= 5 for User 3 Mode, x=6 for User 4 Mode. (Modes are described in the table on page 6.)
<P> - <x>	Select the default mode to have the VOPEX enter upon power-up.
<Esc>	Exit Command Mode

Mice and Trackballs with MACs

The VOPEX can be configured to enable full functionality between mice and trackballs having two or more buttons and a USB MAC CPU. By default, the CPU port on the VOPEX is configured for use with a WINDOWS or SUN CPU and has no special translation for using multi-function mice and trackballs when a MAC CPU is connected. Using the commands in Command Mode above, either enable or disable this feature as needed.

NOTE: Be sure to re-configure the port for connection to a WINDOWS or SUN CPU if a MAC CPU is removed and a WINDOWS or SUN CPU is then connected.

International SUN Keyboards

The VOPEX can recognize international layouts for Sun keyboards. To use an international Sun keyboard, follow this procedure:

1. Disconnect the CPU from the VOPEX
2. Connect the international keyboard to be used to the VOPEX
3. Power down the VOPEX for at least 3 seconds
4. Power up the VOPEX
5. Reconnect the CPU to the VOPEX

It is also possible to configure the VOPEX to emulate a specific international Sun keyboard regardless of what actual keyboard is connected. This is recommended when the CPU needs the layout code (i.e. a SUN CPU) and the keyboard doesn't have an explicit layout code (i.e. some Windows keyboards). To do this, manually set the VOPEX to indicate the international keyboard identification number to the CPU using the following procedure:

1. Connect the keyboard to be used to the VOPEX
2. Power down the VOPEX for at least 3 seconds
3. Power up the VOPEX
4. Enter Command Mode (<Ctrl> - <`>)
5. Type Lxx, where xx is the number from the list below that corresponds to the desired country code
6. Exit Command Mode
7. Power down the VOPEX for at least 3 seconds
8. Power up the VOPEX
9. Reboot the CPU connected to the VOPEX

Country Codes

00	Not Supported	09	German	18	Netherlands/Dutch	27	Swiss/French
01	Arabic	10	Greek	19	Norwegian	28	Swiss/German
02	Belgian	11	Hebrew	20	Persian (Farsi)	29	Switzerland
03	Canadian-Bilingual	12	Hungary	21	Poland	30	Taiwan
04	Canadian-French	13	International (ISO)	22	Portuguese	31	Turkish
05	Czech Republic	14	Italian	23	Russia	32	UK
06	Danish	15	Japan (Katakana)	24	Slovakia	33	US
07	Finnish	16	Korean	25	Spanish	34	Yugoslavia
08	French	17	Latin American	26	Swedish	35-99	Reserved

Hub Ports

The three connections labeled "Hub Ports" can be used to connect any USB device, such as a printer, scanner, camera, etc. for continuous operation at USB 1.1 compliant speeds. These ports are not controlled by the VOPEX.

AUDIO SUPPORT

(Optional)

The VOPEX can be ordered with optional 3.5mm stereo audio ports (ex. VOPEX-USBHA-2/4) for connection to an audio source ("Audio In") and up to 4 self-powered stereo speakers (Audio 1-4).

Audio support provides the following additional features:
- Audio signals from the same CPU that keyboard, mouse, and video signals are from can be received by the user.
- Audio input accepts any standard line level audio (1Vrms or 2.5Vp-p).
- Audio outputs are capable of driving an 8 Ohm speaker load with 200mW of continuous RMS power.

The audio signal is split to all users just as the video signal is split.   The audio ports are not controlled by the VOPEX.
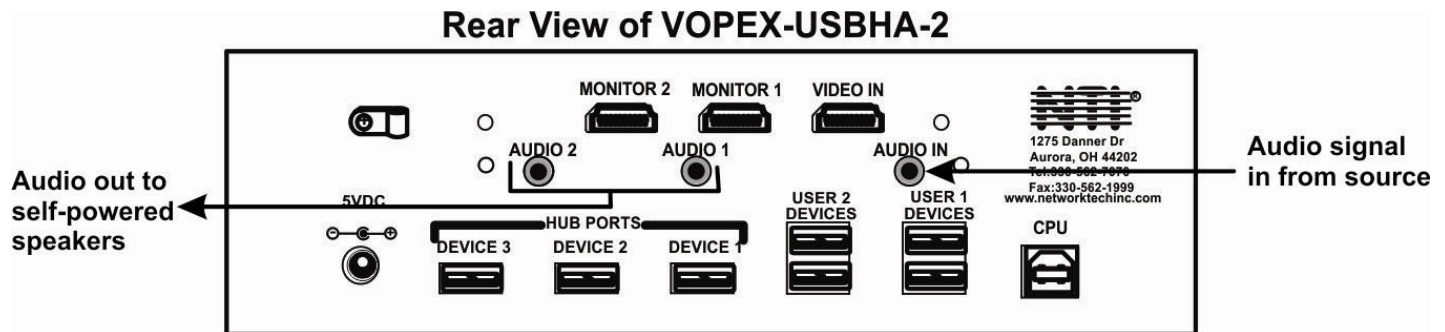

Figure 6- Stereo audio connections

SPECIFICATIONS

Size: Each unit is 8.5"W x 6"D x 2.6"H

Power: VOPEX-USBH(A)-2- Powered by 120 or 240VAC @ 50 or 60Hz-5VDC/3.0A AC Adapter
VOPEX-USBH(A)-4- Powered by 120 or 240VAC @ 50 or 60Hz-5VDC/6.0A AC Adapter

Connections: HDMI Type A- supports HDTV resolutions to 1080i and computer resolutions to 1920x1200. VGA & SGA compatible
USB Type A female device connectors
USB Type B female CPU connector
3.5mm Stereo Audio Jacks (models with stereo audio support only)

TROUBLESHOOTING

PROBLEM	SOLUTION
• Keyboard error	• Check cable connections on CPU and VOPEX
• Mouse not working	• Check cable connections on CPU and VOPEX

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.

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