

## UNIMUX™ Series

# UNIMUX-USBV-xHD(UT)

## High Density USB KVM Switch Installation and Operation Manual



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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.

## FIRMWARE VERSION

Main Controller Firmware Version 1.24

## Typographic Conventions

Typeface meaning	Font Configuration	Example
On-screen computer output	Courier New-(not bold)	C:>
What you type on the computer	Courier New-bold	C:>edit text.bat
Keyboard Keys to be pressed as instructed in the body of a paragraph	Courier New-bold Surrounded by < >	"<L>" means press the "L"

### General

Character	Meaning	Example
+	When "+" is shown between keystrokes, it indicates a chorded sequence (press and hold the keys consecutively until all keys in the sequence are pressed)	<Ctrl>+<`> (accent/tilde key) is a chorded sequence to enter Command Mode.
-	When "-" is shown between keystrokes, it indicates to press the keys consecutively (press and release one at a time)	<A>-<S>-<S>-<E> is a sequence of keys pressed to enable Security Mode

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## INTRODUCTION

The UNIMUX-USBV-xHD High Density USB KVM switch (UNIMUX) allows access to any Windows, MAC, or SUN USB CPUs from one monitor, USB keyboard and USB mouse (up to 32 CPUs). Internal microprocessor circuitry allows all USB CPUs to be booted simultaneously without keyboard error. Port selection is accomplished by front panel push buttons or commands typed on the keyboard. Port LEDs and mode status LEDs continuously update on the front panel. Video formats up to 1900X1200 at 150MHz bandwidth can be displayed from all platforms.

### Types of User Input Devices Supported:

- Compatible with most USB keyboards and mice, including Microsoft USB Intellimouse®, Logitech Cordless Elite Duo keyboard/mouse, Gyration keyboard/mouse, Crystal Vision keyboard with touchpad, and IKEY combo keyboard/touchpad.

### Types of CPUs Supported:

Any USB CPU supporting USB version 1.0 or above including:

- USB Windows (all)
- USB MAC
- USB SUN
- Linux

### Options:

- Two extra USB device ports (total of four) for transparent support of all USB low and full speed accessories- add a "UT" to the part number (i.e. UNIMUX-USBV-xHD**UT**)
- One extra USB device port (total of three) for limited extra USB support- support for touch screen monitor, interactive whiteboard, or CAC card reader- add a "U" to the part number (i.e. UNIMUX-USBV-xHD**U**) LIMITED MODEL AVAILABILITY
- High Density switch with only support for USB keyboard and USB mouse. Remove "V" from the model number. (i.e. UNIMUX-USB-xHD)

## MATERIALS

### **Materials Supplied:**

- NTI UNIMUX-USBV-xHD(UT) High Density USB KVM Switch
- IEC Power cord- country specific
- Rackmount kit (4, 8, and 16 port models only)
- CD with pdf file of this manual and RS232 control software
- DB9 Female-to-RJ45 Female adapter
- DB25 Female-to-RJ45 Female adapter
- 5 foot RJ45-to-RJ45 CAT5 patch cable

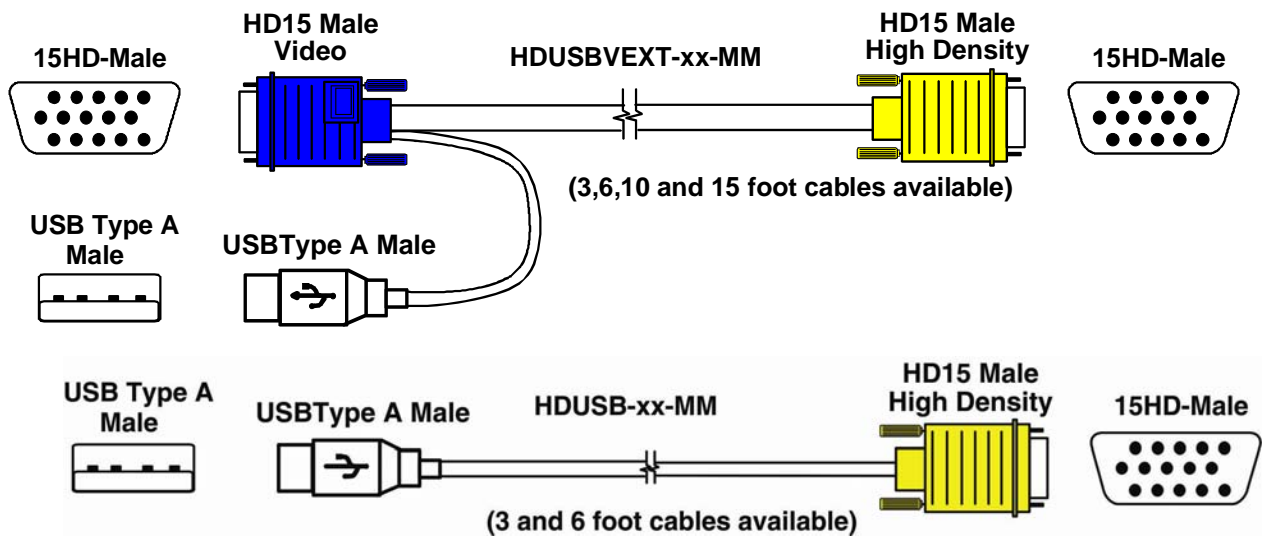
### **Materials Not Supplied, but REQUIRED**

- HDUSBVEXT-xx-MM cable for each CPU being connected to the switch (models with video support)
- HDUSB-3/6-MM -3 or 6 foot cable for each CPU being connected to the switch (models without video support)

Where:

xx is the length of the cable in feet (3,6,10, or 15 feet available)

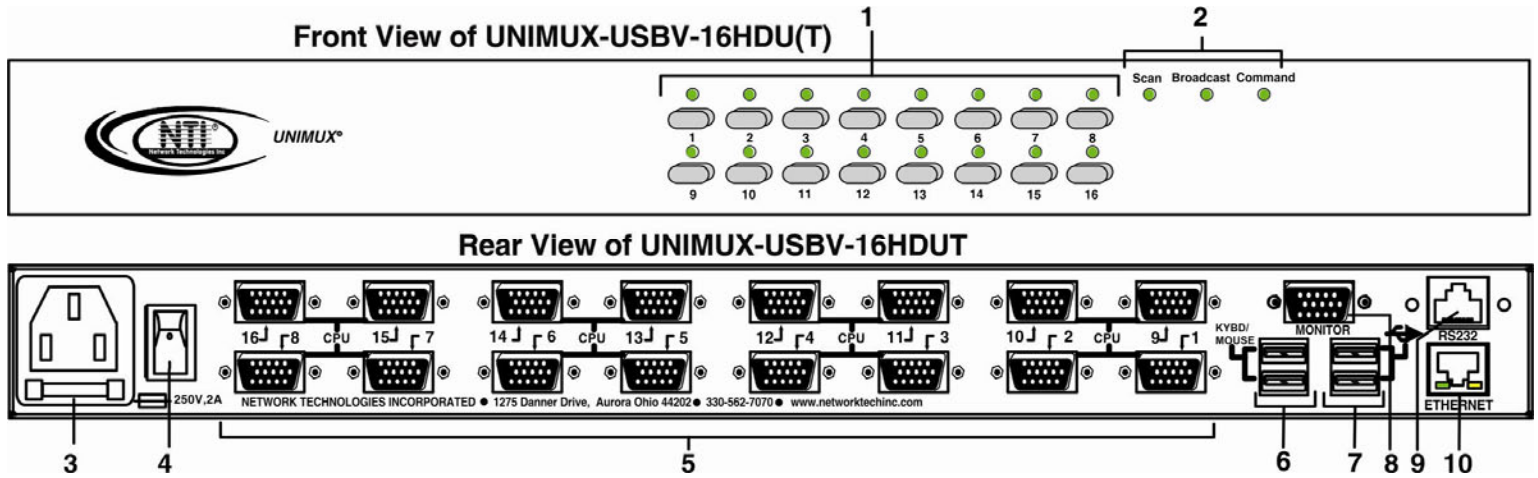
MM indicates male-to-male connector



Cables can be purchased from Network Technologies Inc by calling 800-RGB-TECH (800-742-8324) or 330-562-7070 or by visiting our website at [www.networktechinc.com](http://www.networktechinc.com).

See page 52 for some of the available cables.





## FEATURES AND FUNCTIONS

#	LABEL	CONNECTOR/LED	DESCRIPTION
1	CPU Numbers	Buttons	push to manually switch to a specific CPU or change the switch operating mode
2	Scan,Broadcast, Command	Mode Status LEDs	for visual indication of switch operating mode
3	----	IEC Connector	for attachment of power cord
4	----	Power switch	for turning the power to the UNIMUX On/Off
5	CPU x	15HD female connectors	for connection of CPU cables for video and device support
6	KYBD/MOUSE	USB Type A female connectors	for connection of user keyboard and mouse
7	USB Device Symbol	USB Type A female connector	for USB cable from USB (low and full speed) devices (models with additional transparent USB support only)
8	MONITOR	15HD female connectors	for connection of user monitor
9	RS232	RJ45 Female connector	for attaching RS232 interface cable from a CPU to control the functions of one or more switches
13	ETHERNET	RJ45 female connector	for connection to an Ethernet for remote user control via TCP Port 2005 (configurable)

### Additional Features

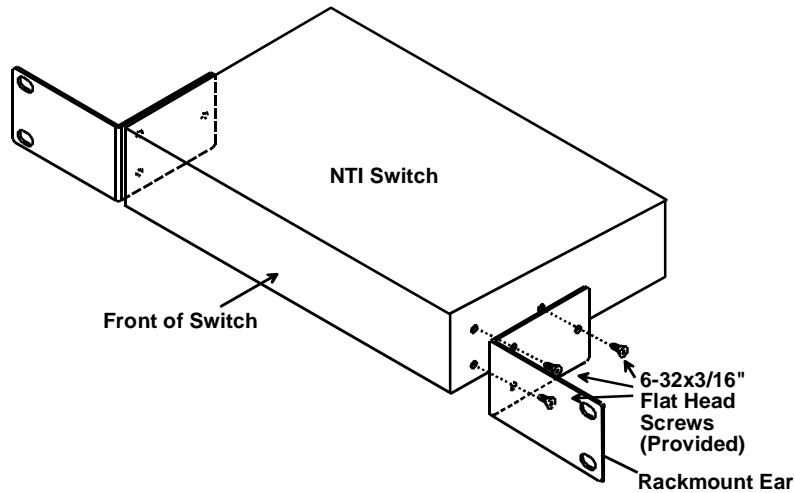
- Any USB type user device can control any USB CPU (Windows, MAC, and SUN platforms).
- Power cycle circuit control allows the UNIMUX switch to be powered OFF, then ON, at any time without affecting the attached CPUs. (This assumes that the CPU supports hot plugging.)
- Security features can be enabled.
- A microprocessor is dedicated to each CPU, preventing connected CPUs from locking up.
- Any user device cable can be hot-plugged.
- The front panel LEDs indicate the CPU the user is connected to.
- No dip-switches or jumpers necessary to configure.
- Video formats up to 1920X1200 can be displayed from all platforms.
- Users can control the switch using the On Screen Display (OSD)
- RS232 control allows control of the switch with one CPU serial port. (Windows-based software is provided.)
- NTI Switch Control Program provides easy and powerful graphical control of NTI switches through the RS232 interface. (Windows only.)
- Optional extra USB ports (2) available for transparent support of USB (low and full speed) devices

## RACK MOUNTING INSTRUCTIONS

This NTI switch was designed to be mounted to a rack or to sit on a desktop. It includes rackmount ears to make attachment to a rack easy, and rubber feet to be applied to the bottom of the case if it will instead sit on a flat surface. If this will sit on a flat surface, simply apply the rubber feet to the bottom of the case in each of the 4 corners.

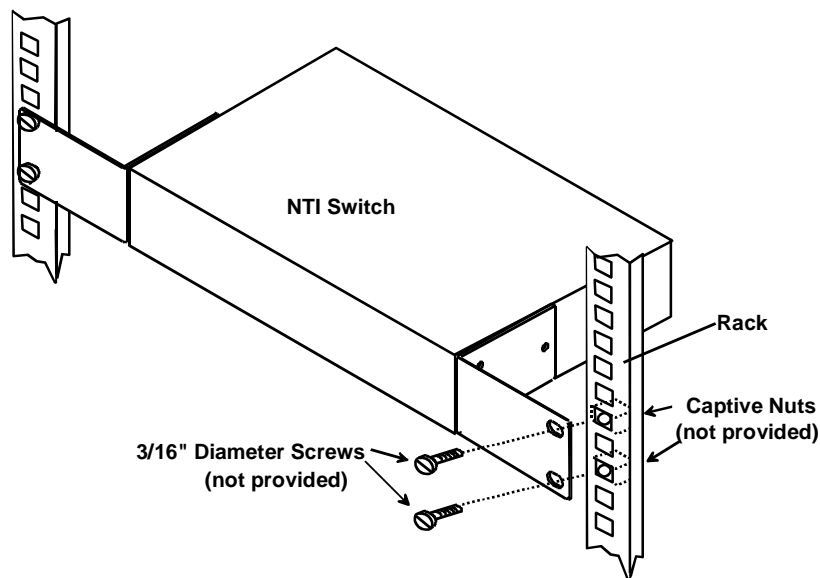
### To Mount to a Rack

1. Attach the ears to the switch using the 6-32x3/16" flat Phillips-head screws (6) provided as shown in the illustration below. The holes in the ears should line up with pre-threaded holes in the sides of the NTI switch. Tighten the screws securely.



**Figure 1- Secure rackmount ears to switch**

2. Install 4 captive nuts (not provided) to the rack in locations that line up with the holes in the mounting ear on the NTI switch.
3. Secure the NTI switch to the rack using four 3/16" diameter screws (not provided). Each screw should be of sufficient length to go completely through the NTI mounting ear, rack frame and fully engage all threads in the captive nut. Be sure to tighten all mounting screws securely.
4. Attach all cables securely to the switch and where necessary supply adequate means of strain relief for cables.



**Figure 2- Secure switch to a rack**

## INSTALLATION

It is not necessary to turn OFF power to CPUs or monitors during this installation unless RS232 is going to be connected. All cables, except for the RS232 cables, may be hot plugged.

If using RS232 Control see RS232 section on page 34 for more information. Observe normal precautions when connecting the RS232 cables to the CPU. Refer to the owner's manual for the CPU being connected for precautions, if any.

1. Connect the 15HD male cable end from the user monitor to the female black 15HD port marked "MONITOR x" on the rear of the UNIMUX switch (see Figure 3 ). If a touch screen monitor is being connected (models with touch screen support only), connect the USB cable from the monitor to any one of the USB type A connectors in the same user device port group (see Figure 4 ).

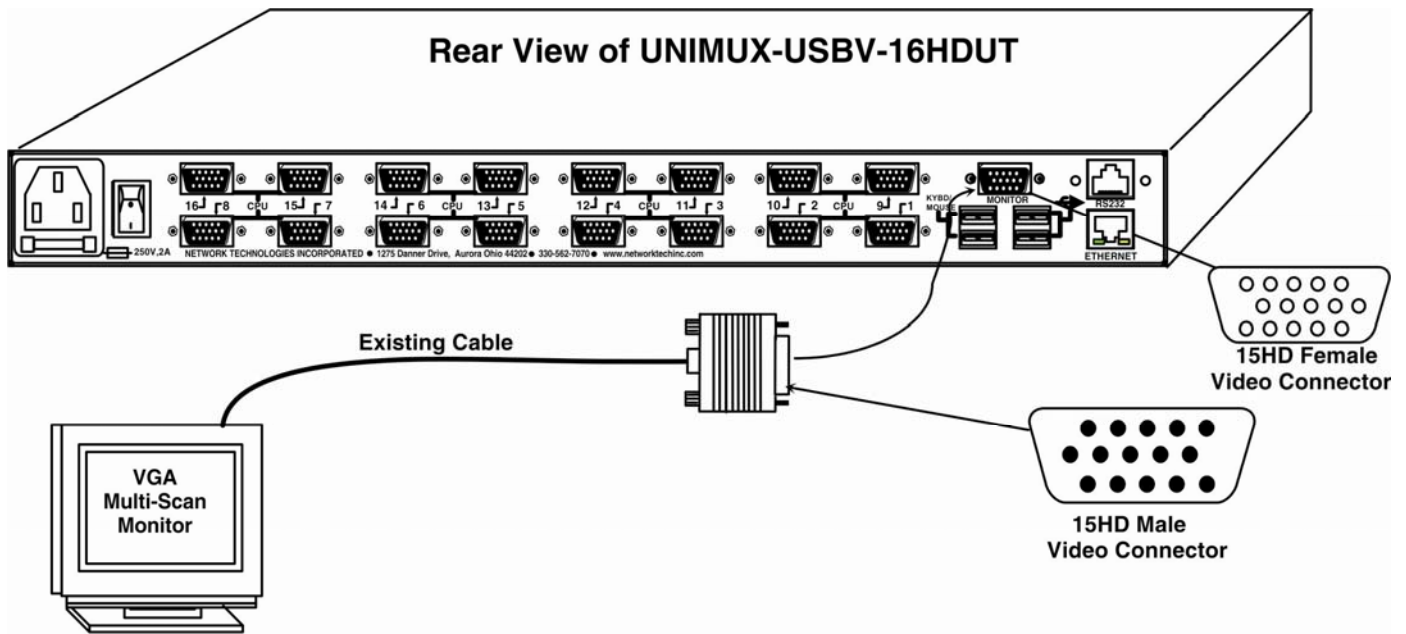


Figure 3- Install user monitor

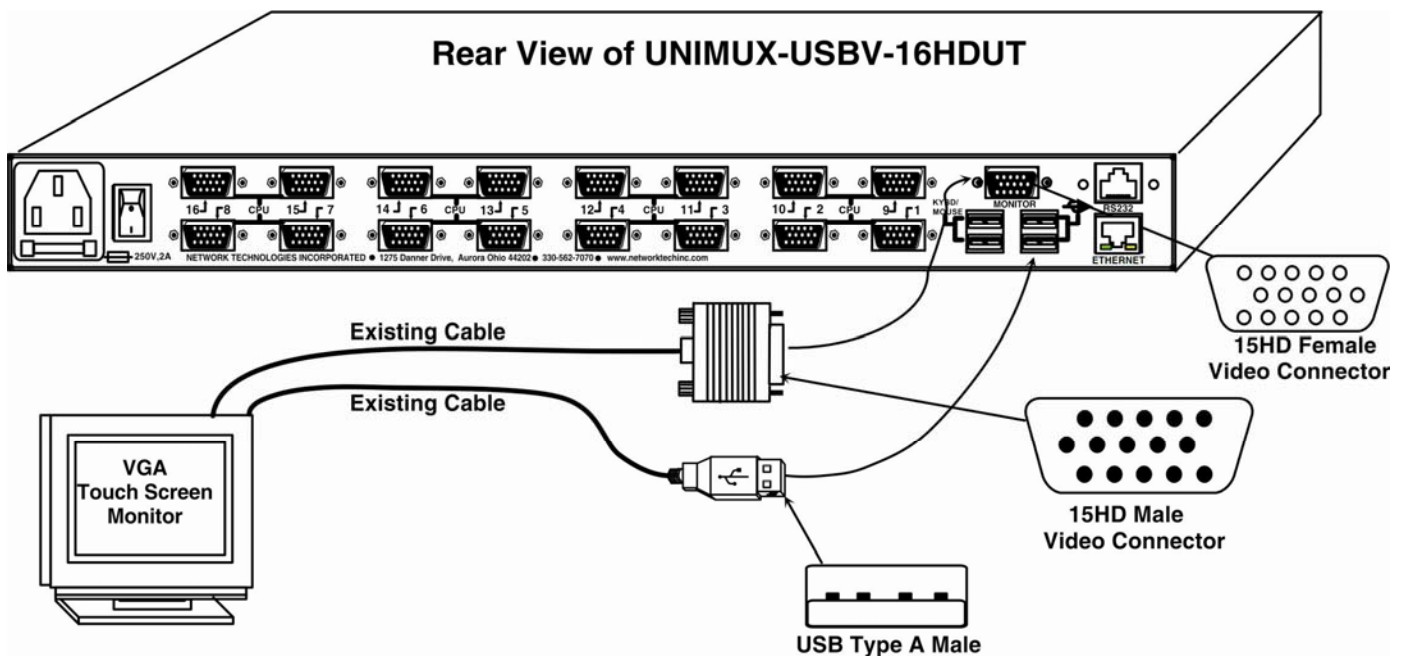



Figure 4- Install user touch screen monitor

- Connect the user devices to the USB type A female ports labeled “KYBD/MOUSE” on the rear of the UNIMUX switch (see Figure 5 ). Connection to these ports will provide user control of the UNIMUX switch.

**Note:** If there are four (4) USB type A female ports present (models with transparent USB support only), then the two additional USB ports labeled with the USB symbol (  ) are available for connection of any USB device. However, the keyboard and mouse intended to control the UNIMUX switch must be connected at the USB ports labeled “KYBD/MOUSE”.

**Note:** If device cables are not long enough to reach the UNIMUX switch, they can be extended up to 20 meters using up to 4 NTI USB2-AA-5M USB 2.0 Active Extensions (see Figure 6)- purchased separately. Contact your NTI salesperson for more details by calling (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 or visit our website at <http://www.networktechinc.com>.

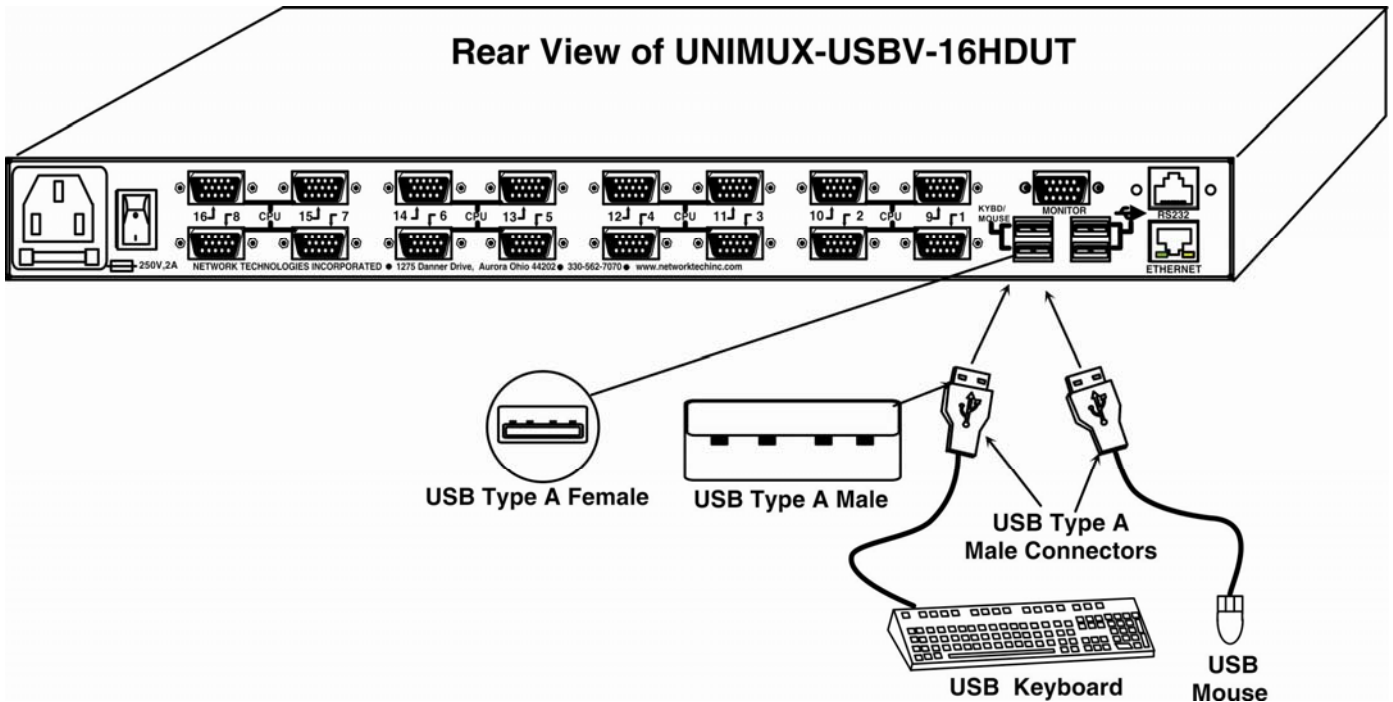


Figure 5- Install user devices (mouse and keyboard)

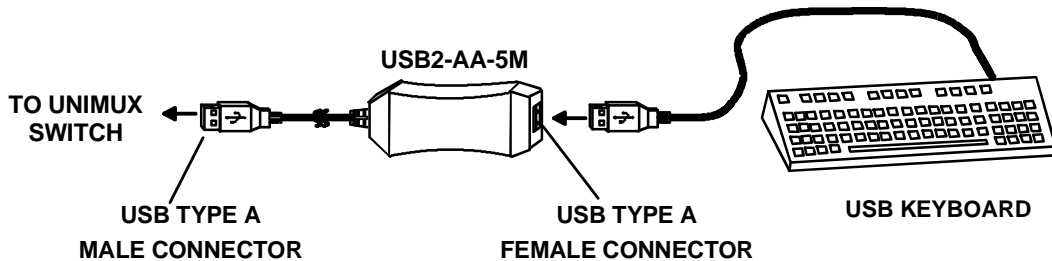


Figure 6- Use USB2-AA-5M to extend a device, or a computer

3. For each CPU:

- Connect a USB type A cable end of a HDUSBVEXT-xx-MM cable to a USB type A female user device port on a CPU.
- Connect the 15HD blue male cable end of a HDUSBVEXT-xx-MM cable to the video port of the same CPU.
- Connect the 15HD yellow male cable end of the HDUSBVEXT-xx-MM cable to a “CPU x” port on the UNIMUX switch. (See Figure 7)

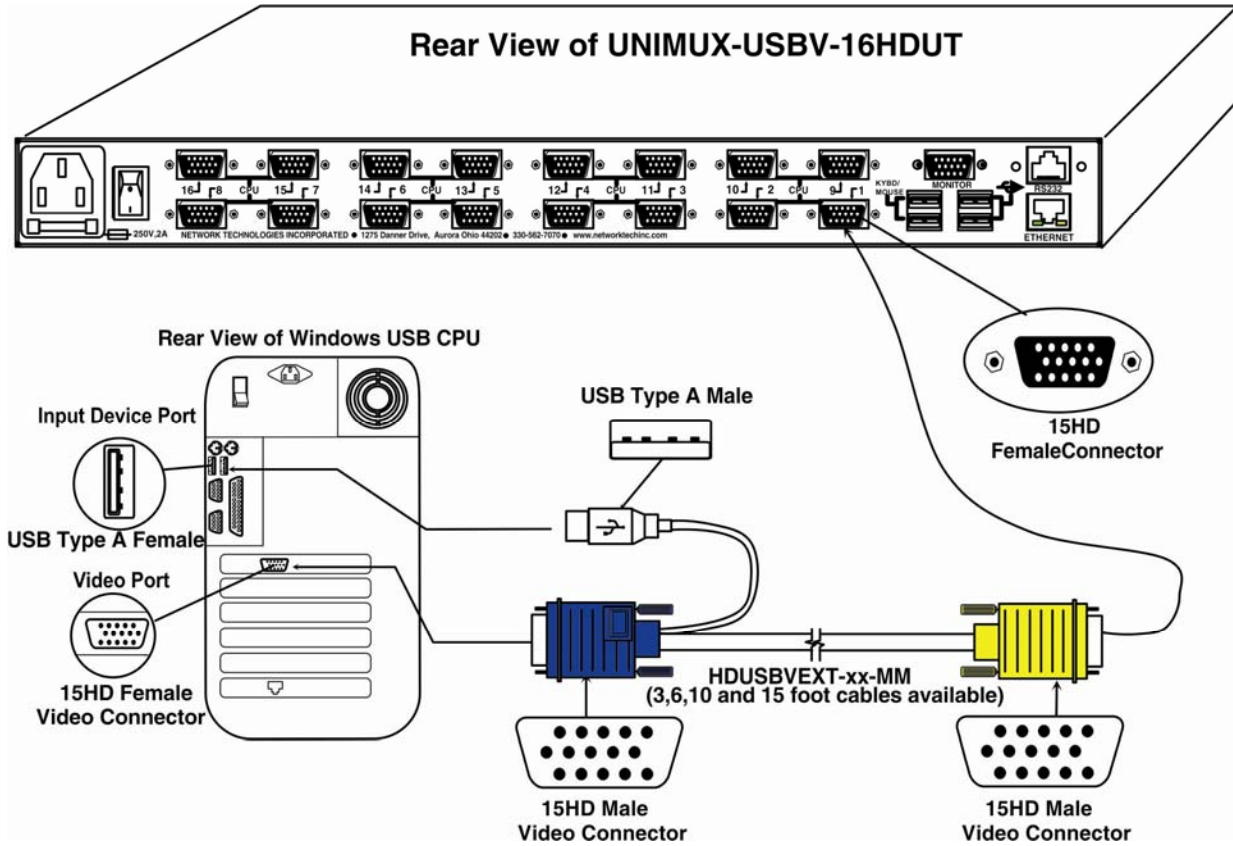


Figure 7- Connect each CPU using a HDUSBVEXT-xx-MM cable

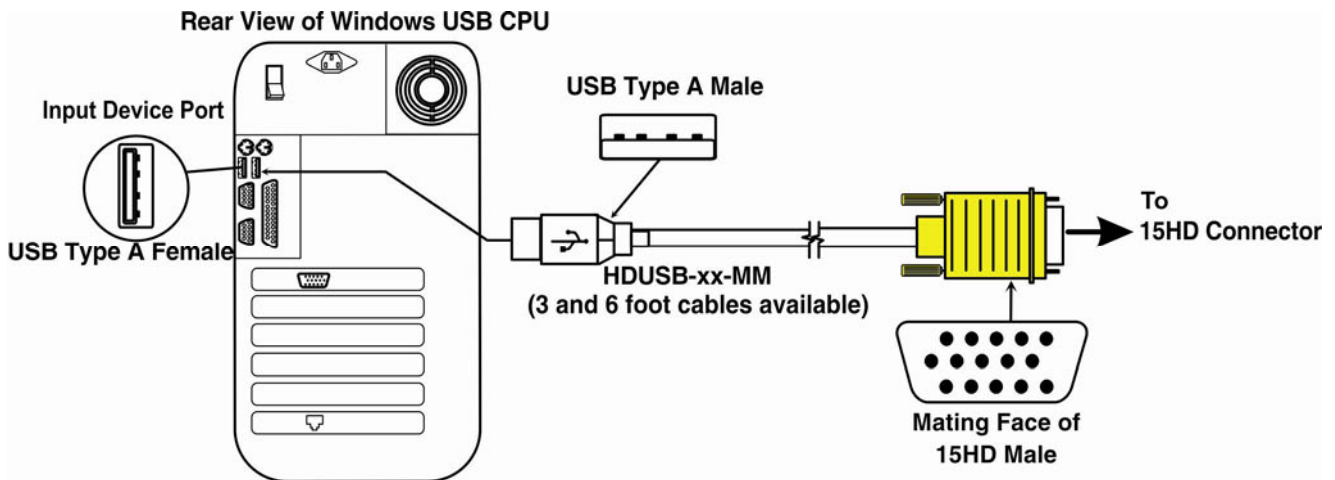


Figure 8- Models without video support, connect using a HDUSB-xx-MM cable

4. Power-up

- The UNIMUX can be powered at any time.
- The CPUs can be powered at any time although if a CPU needs a keyboard and/or mouse at power-ON it should be powered after connecting to and powering-ON the UNIMUX.
- The keyboard and mouse (only) can be hot plugged to and from the UNIMUX at any time.

**Note: The order in which the CPUs and switch are powered up does not matter. A power strip can be used.**

Immediately after powering ON the UNIMUX, the following splash screen will appear on the monitor if the OSD option is built into the switch:



If the security option is enabled (see page 14 for details on the "Security Option"), when the UNIMUX is powered up the user will be prompted for a username and password to continue. If the security option is not enabled the monitor will display the desktop image for the connected CPU and the user can continue with normal operation of the connected CPU.

**RS232 Connection**

If RS232 control will be used, connect one end of the CAT5 patch cable (supplied) to the port labeled "RS232" on the rear of the UNIMUX. Plug the other end of the CAT5 cable into either the RJ45-to-DB9 or RJ45-to-DB25 adapter supplied, and connect the adapter to the RS232 port on the control terminal. Follow the instruction under "RS232 Control" on page 34 for configuration and use of the RS232 control feature.

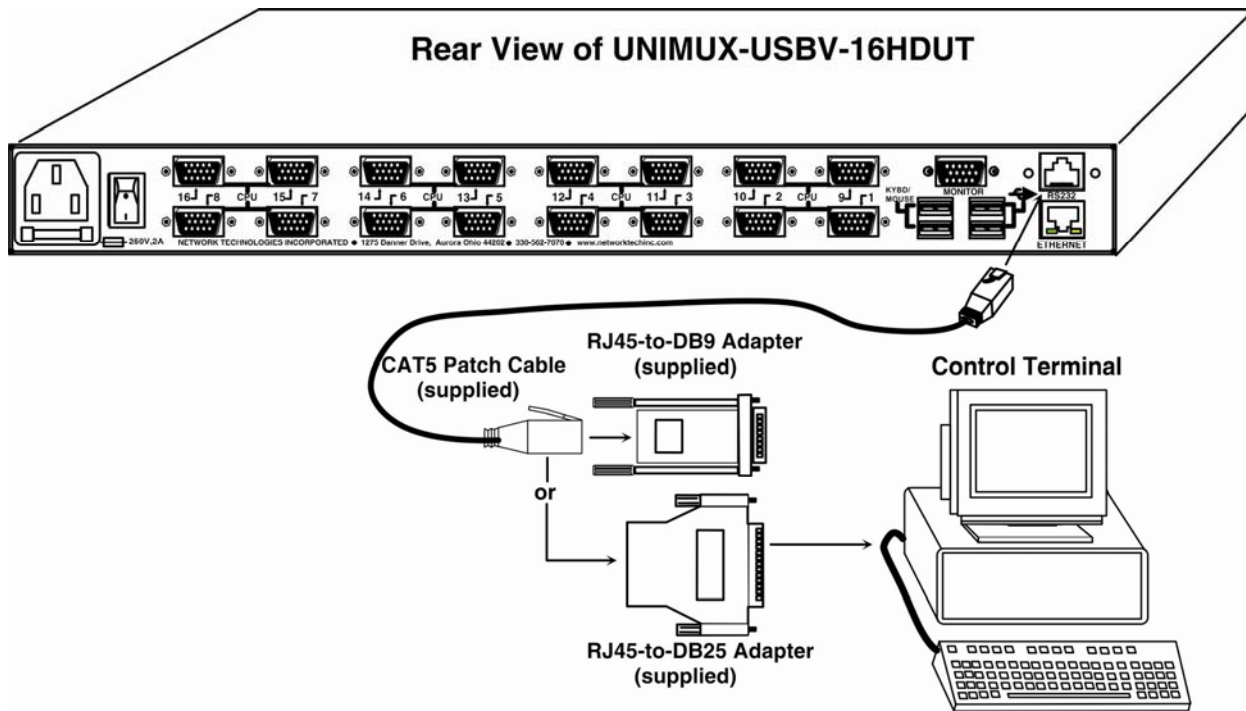


Figure 9- Connect cable for RS232 control

## Ethernet Connection

If the Telnet Interface will be used (page 40), and Ethernet connection to the Local Area Network (LAN) must be made using CAT5 cable with RJ45 connectors attached. Wiring between the connectors should be straight thru (pin 1 to pin 1, pin 2 to pin 2, etc.). Connect a CAT5 cable between the port labeled “ETHERNET” on the rear of the UNIMUX and the LAN.

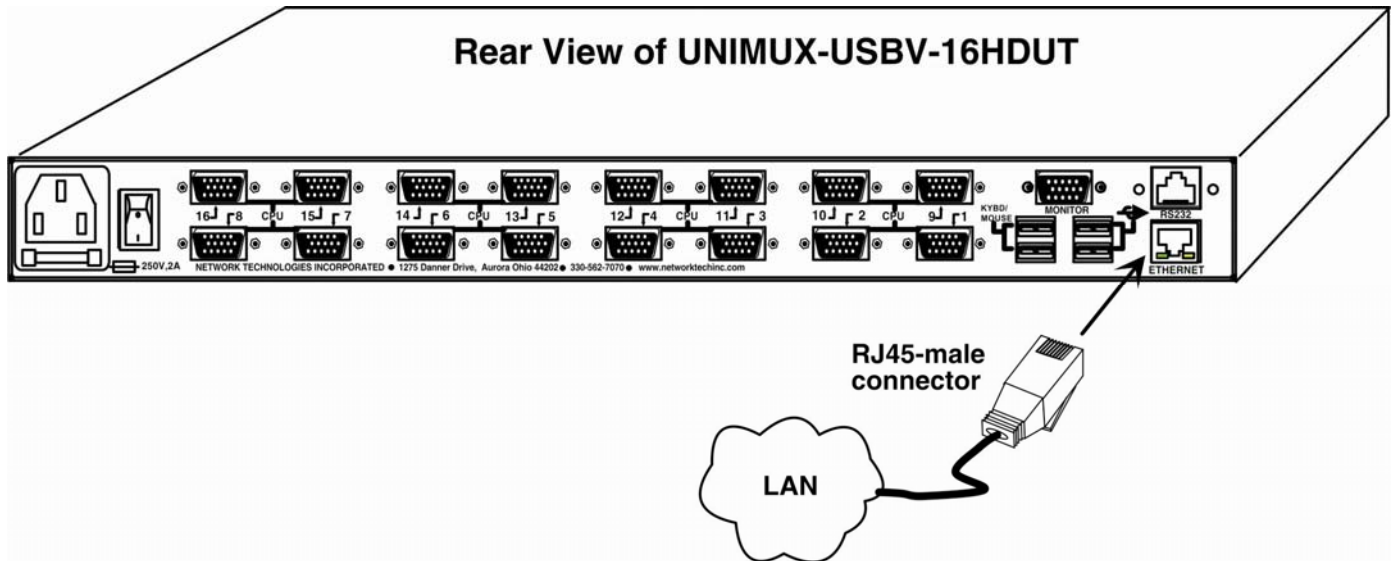


Figure 10- Connect LAN to Ethernet port

## Transparent USB Ports

If the UNIMUX you have purchased includes the transparent USB ports option (UNIMUX-USBV-xHDUT), then it supports the connection of any USB (low- and full-speed) device. Devices such as CAC card reader, flash drives, whiteboards, printers, etc will connect to the PC attached to the selected “CPUx” port.

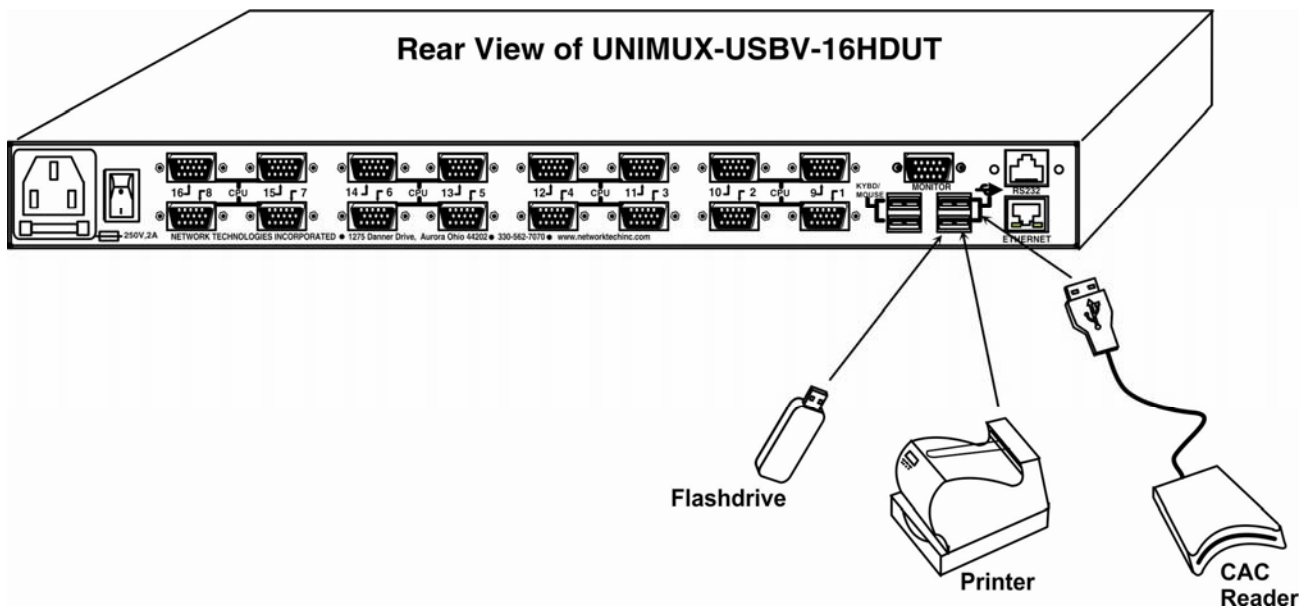


Figure 11- Transparent USB Ports



### Limited Extra USB Support

If the UNIMUX you have purchased includes only one extra USB port for a total of three (UNIMUX-USBV-xHDU), then extra support is limited to the connection of a touch screen monitor, interactive whiteboard, or CAC card reader. When used, the additional USB device will connect to the PC attached to the selected “CPUx” port.

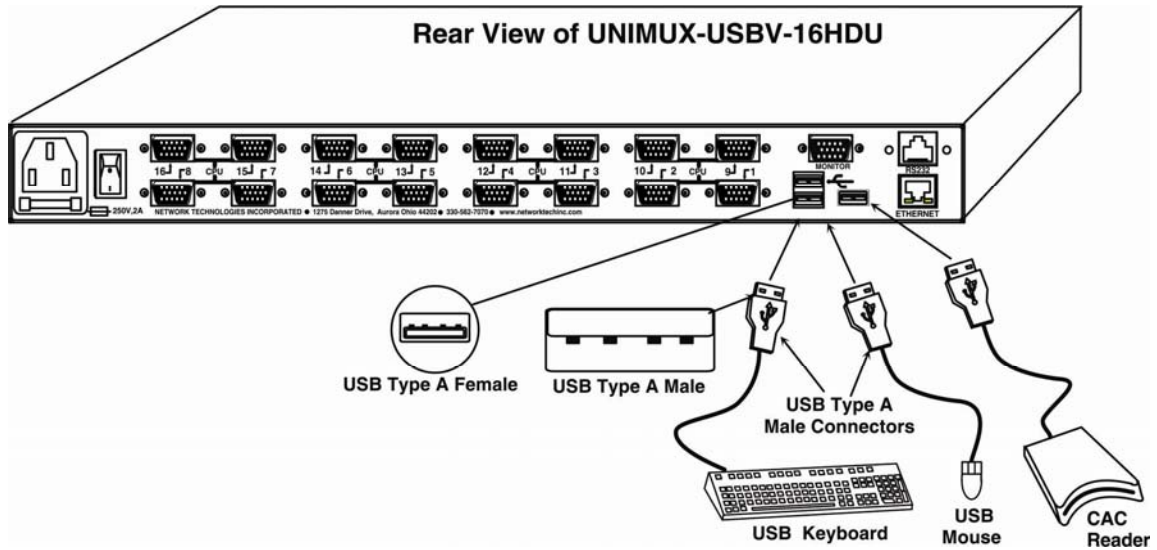


Figure 12- Limited Extra USB Support

### No-Video Models

Some models of UNIMUX Hi Density USB KVM Switch have been specially designed without support for video. As such, the OSD menu control described in this manual cannot be used. To control the No-Video version of this product, use the following control methods described in the manual:

- front panel control using touch-switches and LEDs (see page 13)
- RS232 control (see page 34)
- Telnet Interface- via command line interface (see page 40)

**Note: Ethernet configuration cannot be changed using the OSD menu in the absence of video support. Instead, to change network settings, use the NTI Discovery Tool provided on the CD (page 45). (Default configuration settings can be found on page 27.)**

Cables are available from NTI having only the 15HD high density connector at one end and USB Type A male connector at the other end (HDUSB-x-MM where x = 3 or 6 feet).

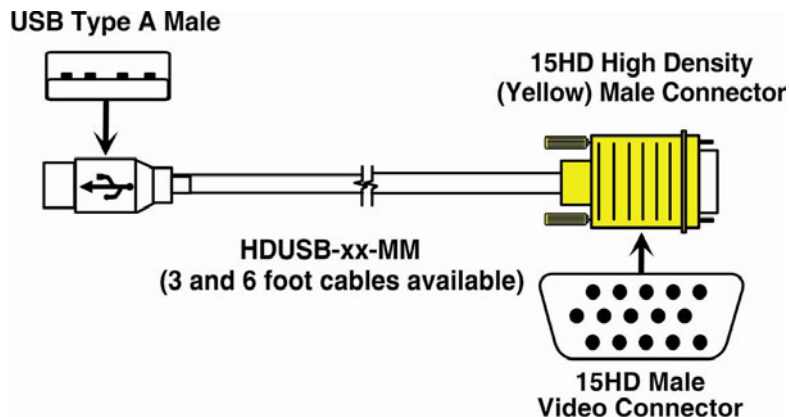


Figure 13- Cable for USB support only

**LIMITATIONS**

- Only two non-HID (Human Interface Device) can be connected at a time (device other than keyboard or mouse)
- A USB hub (single or multi-port) can be used.
- Only a USB Windows or SUN keyboard or USB mouse may be connected to the USB port on a USB MAC keyboard
- A maximum of 5 input devices may be connected to the UNIMUX at the “KYBD/MOUSE” ports either directly or through hubs.

See Figure 14 for some examples of input device combinations that can be used with the UNIMUX.

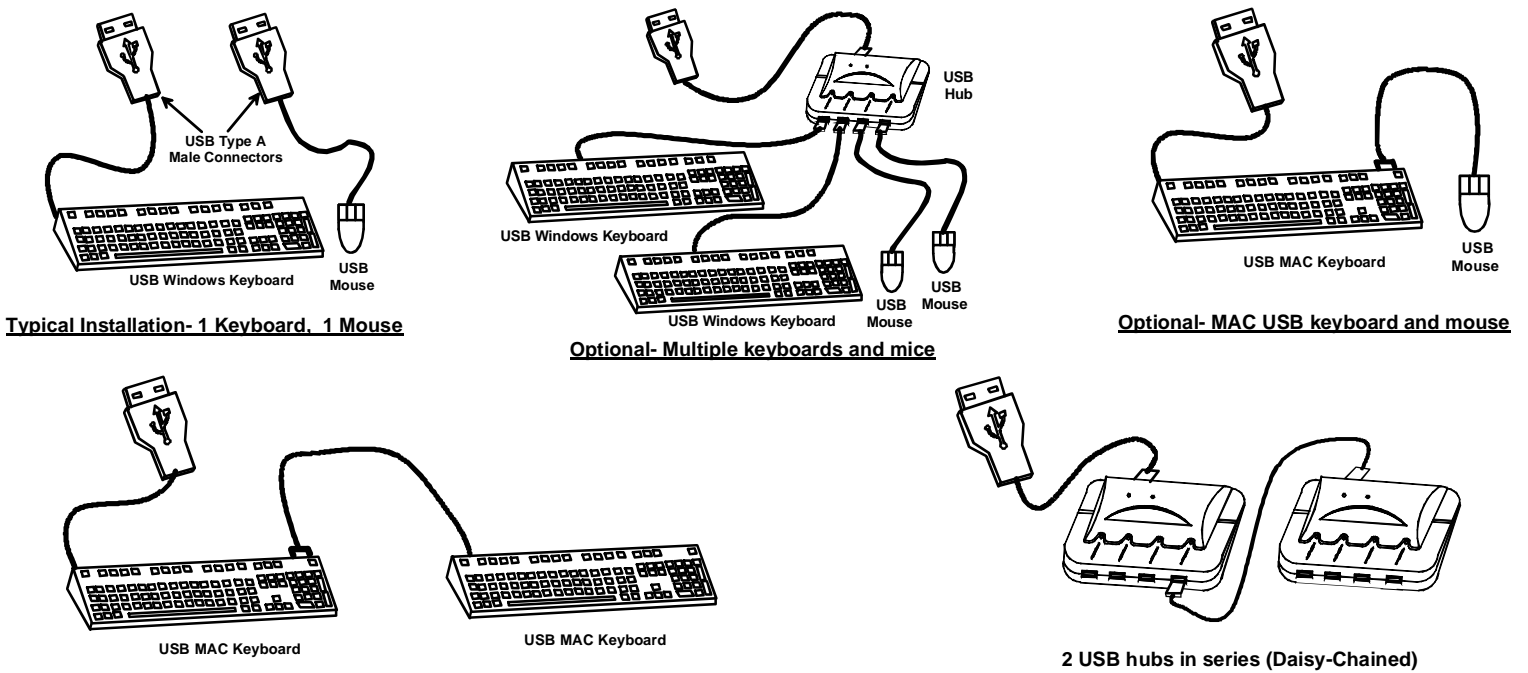


Figure 14- Compatible device combinations

## USING THE UNIMUX USB KVM SWITCH

### Basic Operation

Once the UNIMUX is properly connected, the UNIMUX will enable a connection to be made between the CPUs attached to its VIDEO and CPU ports and the monitor and input devices attached to the MONITOR and DEVICES ports. The LEDs on the control panel of the UNIMUX will illuminate depending on which port (and corresponding CPU) is being connected to the monitor and input devices.

The UNIMUX can be controlled by four methods:

- front panel control using touch-switches and LEDs
- OSD control via the user devices (models with video support only)
- RS232 control (see page 34)
- Telnet Interface- via command line interface (page 40)

### Front Panel Control

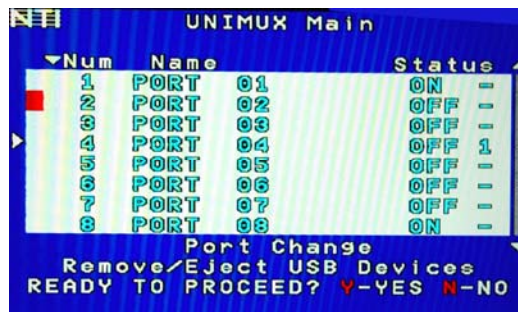
There is a touch-switch and LED on the front panel of the UNIMUX for each CPU the switch will connect the monitor and input devices to. Pressing any touch-switch on the front panel of the UNIMUX will connect the corresponding CPU to the monitor and input devices.

Holding down any front panel touch-switch for more than 2 seconds will cause the UNIMUX to cycle through all modes of operation including COMMAND, BROADCAST, SCAN, and NORMAL (described starting on page 20). The three MODE LEDs on the front panel indicate which mode is selected. Release the touch-switch when the LEDs indicate the desired mode. When no mode LEDs are illuminated the user is in Normal Mode controlling directly the CPU to which the user is connected through the UNIMUX.

If the UNIMUX includes the Transparent USB option (UNIMUX-USBV-xHDUT), and if the USB Device Warning is enabled (Setting, page 18), then pressing any touch-switch on the front panel will not immediately connect the corresponding CPU to the monitor and input devices. With the first press of any touch-switch (momentary or extended), a device warning (below) will pop-up on the user's monitor.

To use COMMAND, BROADCAST, or SCAN mode, we recommend that you disable the device warning first. See page 18.

Device warning →



Select "N" to properly eject your devices through the CPU operating system before switching ports, and then return to the OSD menu to switch ports or press the touch-switch twice more to make the change in port connection.

Select "Y" to proceed with a port change to another CPU. Any devices connected to the transparent USB ports will automatically connect to the newly selected CPU.

If a touch-switch is pressed a second time instead of just once, this device warning will be bypassed and the port change will proceed immediately.

### Keyboard Control

Keyboard control of the UNIMUX can be achieved using OSD Command Mode. Command Mode is operated using the keyboard and mouse in conjunction with OSD menus superimposed onto the monitor. For all models use the menus as instructed on page 12.

By pressing <Ctrl> + <`> (accent key), the user can enter Command Mode. Once in Command Mode, typing a series of commands will cause the UNIMUX to connect the user to any one CPU connected to the switch. Pressing the <Esc> key will exit Command Mode.

## OSD CONTROL

(OSD Control applies only to UNIMUX models with video support)

OSD superimposes a menu system on the user's video screen with a list of all connected CPUs. OSD allows CPUs to be named (with up to 12 character names). OSD then allows selection of CPUs by that name. Connected CPUs can be listed by name or by port number. OSD Search Mode enables the user to type in the first few characters of the CPU's name and the OSD will locate it. HELP screens assist with all OSD functions.

### Guidelines for Navigating OSD Menu

*Throughout this manual, various rules apply to navigating the menus used to control and operate the UNIMUX.*

- *OSD menus can be navigated using the mouse, the arrows on the keyboard, hot keys (highlighted in red) and the <Page Up>, <Page Down>, <Home>, <Tab> and <End> keys.*
  - *The <up arrow> and <down arrow> moves the cursor up or down one line item at a time in a scrollable window, or between menu items in a menu item list*
  - *The <left arrow> and <right arrow> will move the cursor left or right through menu items or while in editable fields (such as when editing port names)*
  - *<Page Up> and <Page Down> increase/decrease the listed ports by one page at a time*
  - *<Home> will jump to the beginning of the list*
  - *<Tab> will jump between selectable fields, left to right to move between menu items*
  - *<Shift>+<Tab> will jump between selectable fields, right to left*
  - *<End> will jump to the end of the list.*
- *Only alphabetic and numeric characters can be typed in the OSD menu fields*
- *Positioning the mouse cursor over a menu function or CPU name will highlight the background (green highlight for menu functions, cyan or light blue for CPUs)*
- *The scroll bar can be used by clicking on the corresponding up and down arrow above and below the scroll bar.*
- *The mouse wheel may be used to move the selection bar*
- *The <Shift> key must be used to enter an uppercase letter within all OSD menus.*
- *Clicking on a listed CPU while in Command Mode will connect the user to that CPU.*
- *Available functions will have white characters with one red character. The red character corresponds to a keyboard "hot key". Hot keys are not case sensitive. Functions that are not available will be transparent.*
- *When changing characters for names, passwords, or values within an edit field, click on the field or select and press <Enter> to enter the field for editing, and press <Enter> again to exit the edit field.*
- *To exit (and step back 1 menu) from any menu, press <Esc> on the keyboard .*
- *All screens that include "F1:Help" for context-sensitive help will also respond to pressing the <F2> key to provide "Global Help" screens with basic menu navigation help.*

### Security Option

The security option in the OSD Control of the UNIMUX USB KVM switch enables an administrator to control access to CPU ports for each user. Up to 63 users can be created. These users have controlled access to any CPU. Only the administrator can activate or deactivate the security features on the user port. Finally, the administrator can set a maximum idle time value after which the current user will be logged out and the login screen displayed again if the user has no activity. The current security status, idle time out, and scan dwell time are all saved and will be restored whenever power to the switch is cycled OFF, then ON. To reset the administrator's password call NTI and have the device serial number of the UNIMUX available. For more on security, see page 22.

## Initial startup

When the UNIMUX is first powered ON, a splash screen similar to the following will appear:



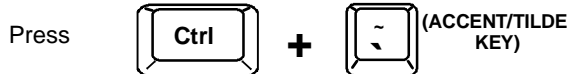
Press any key and the UNIMUX will connect you to the first CPU port with a connected CPU that is powered ON.

To access Command Mode and connect to a different port or perform other user access functions (see below), press <Ctrl> + <~> (accent/tilde key).

## User Access Functions

### Command Mode

In order to control the switch with the keyboard, Command Mode must be enabled. To enable Command Mode from the keyboard:



All the status lights on the keyboard will illuminate to indicate that Command Mode is enabled. At this point, the Command Mode menu will be displayed.

The Command Mode menu (see Figure 15) lists all CPUs by name and port number. Only 8 ports are listed on the screen at a time. To view the other portions of the list, scroll using the arrow keys on the keyboard or use the mouse to click on the arrows on the scroll bar in the OSD menu. When the Command Mode main menu is displayed, the first displayed port in the list will be the port the current user is connected to, followed by the next seven consecutively numbered ports. (Alternatively the list may be sorted alphabetically- press the letter <O> to toggle sort method.) The names of accessible ports are displayed with blue characters. If Security is activated, the access rights for the user logged-in may not include all ports. Names of restricted access ports are displayed in black.

An arrow to the left of a port number in the list indicates the port the user is currently connected to. From left to right, the columns display the following:

- Port Number
- Port Name
- Power Status of the CPU (ON/OFF)

**Note: "NAC" indicates a non-accessible computer for that user**

- The actual user number (1-8) connected to the CPU.
  - If no user is connected to a CPU, the user number is replaced by a "-" (dash).

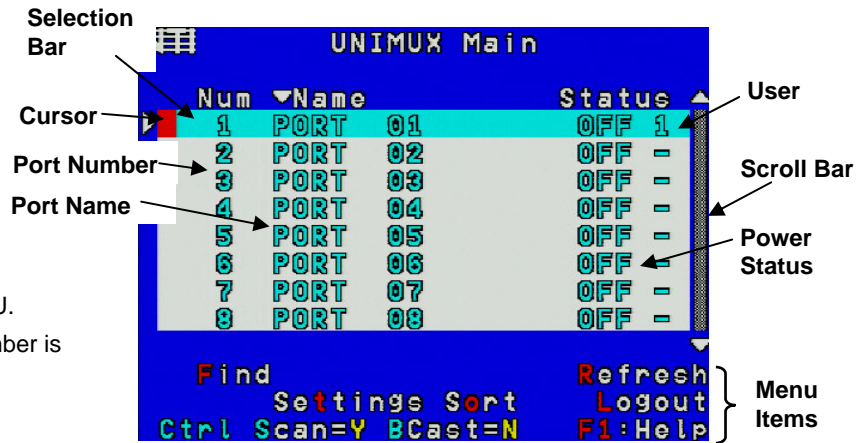


Figure 15- Command Mode main menu-User

**Note: While in Command Mode, the numbers on the NUM PAD on the keyboard are not active. If numbers are required while in Command Mode, use the numbers on the main key bank.**

The list below describes the command functions available from the keyboard within the OSD mode of control after entering into Command Mode:

Function	Keystroke
Select the previous port	up arrow
Select the next port	down arrow
Go to specific port- Press any valid number from 1-1024 to connect to a desired port.	port # - Enter
Increases the ports listed by 1 page	Page Down
Decreases the ports listed by 1 page	Page Up
Enter "Settings" menu	T
Toggle ports listed to view by port number or alphabetically by port name	O (letter, not number)
Enable/disable Scan Mode	Ctrl + S
Enable/disable Broadcast Mode	Ctrl + B
Enter Administrator menu (only available if the Administrator is logged in)	A
Select the first port on the switch	Home
Select the last port on the switch	End
Display Help menu	F1
Global Help- display window navigation tips used throughout all menus	F2

If the USB Device Warning is enabled (page 18), changing ports using the Up Arrow, Down Arrow, or typing the port number and pressing <Enter> will prompt the warning message to pop up (page 17), requiring a response from you before proceeding.

**Note: The user must exit Command Mode to type to a CPU.**

To exit Command Mode press <Esc> on the keyboard.

Function	Keystroke
Enter Find Mode, add a character to search string and select the CPU's name that matches best.  Type any alphabetical or numeric character (A-Z, 0-9)  <i>Note: use is not case sensitive</i>	F
Switch to selected port	Enter
Logout (you will be prompted for confirmation)	L
Exit Command Mode	Esc

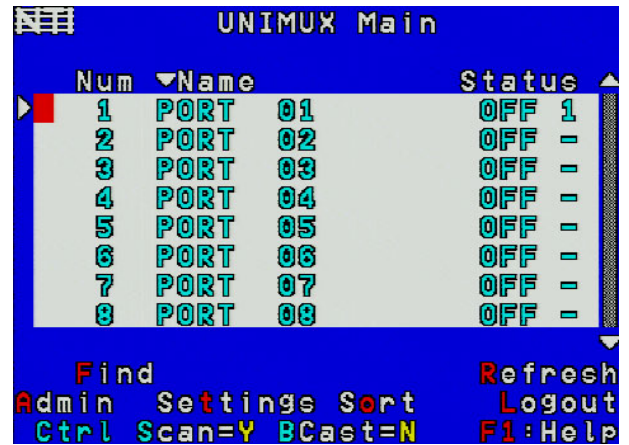



Figure 16- Administrator's main menu

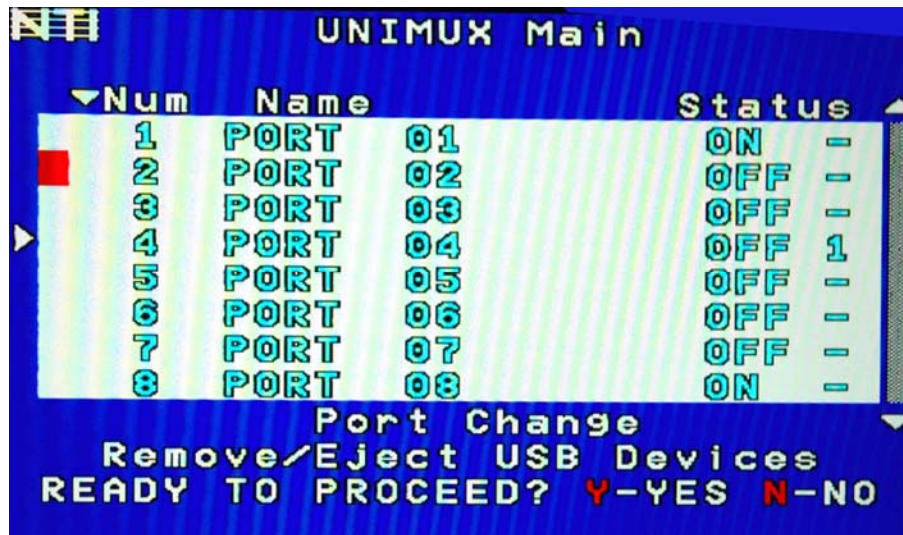
### USB Device Warning

(Applies to models with Transparent USB option only (UNIMUX-USBV-xHDUT))

When you choose to switch ports, if the **USB Device Warning** is enabled (see Settings on page 18), you will be prompted for a confirmation "Y" or "N" to proceed. This provides the user with a reminder and opportunity to close the OSD menu and properly use the operating system to eject any USB device connected to the transparent USB ports (labeled with USB symbol- ) on the UNIMUX. Otherwise, if a flash drive or external hard drive is connected to a USB port, data on it may be corrupted if the device is not safely stopped/ejected before switching ports.

Select "N" to properly eject your devices through the CPU operating system before switching ports, and then return to the OSD menu.

Select "Y" to proceed with a port change to another CPU. Any devices connected to the transparent USB ports will automatically connect to the newly selected CPU.



## Settings

To enter the Settings menu (see Figure 17) press <T> from the Command Mode menu. The list below describes the Settings menu functions available from the keyboard:

Function	Keystroke
Open OSD Settings screen	O
Go to Broadcast list	B
Go to Scan list	S
Change the scan dwell time period Enter any value from 002-255 (for more on this-see "Scan Mode" page 20)	T
Enable/Disable right mouse button click emulation with Apple 1-button mouse (see "Mouse Click Equivalents" on page 32 for more)	R
Enable/Disable reminder warning for ejecting USB device on connected CPU before proceeding to switch to a new CPU (on models with transparent USB port option only) <b>See page 17 for more.</b>	U
Exit from Settings menu Return to Main menu	Esc



Figure 17- Settings menu

When the <T> is pressed, the current value of the scan dwell time is selected with an edit field (see Figure 17) . The user can introduce a new value for scan dwell time and press <Enter> to save it or <Esc> to exit. Any value between 002 and 255 (seconds) is acceptable.

**Note:** When using Scan Mode, we recommend that the USB Device Warning be disabled. Otherwise, when the UNIMUX tries to switch from one port to another, the operation will pause waiting for a "Y" response to proceed to the next port.



## OSD Settings

The OSD Settings screen enables the user to adjust the height of the OSD screen on the monitor and the position of it. The position can be adjusted both horizontally, as well as vertically. Press <O> from the Settings menu (page 18) to open the OSD Settings screen.

Function	Keystroke
Make OSD window taller	T
Make OSD window shorter	S
Move OSD window vertically	up or down arrow
Move OSD window horizontally	left or right arrow
Exit and save OSD Settings	Esc



Figure 18- OSD Settings screen

## Find Mode

Find Mode is enabled by typing any alphabetical or numeric characters while in the Command Mode main menu, or by pressing <F> while in supporting menus.

Find Mode allows the user to enter and maneuver through a list of CPU names. The CPU name best matching the characters typed is selected. The list of CPUs may also be searched for a specific (or similar) name. The Find Mode function is not case sensitive. The following commands are valid when the search option has been invoked from Command Mode.

Function	Keystroke
Erase previous character in search name	Backspace
Add a character to the search string and select the best matching CPU name	A-Z, 0-9 (upper or lower case)
Exit Find Mode	Esc or Enter

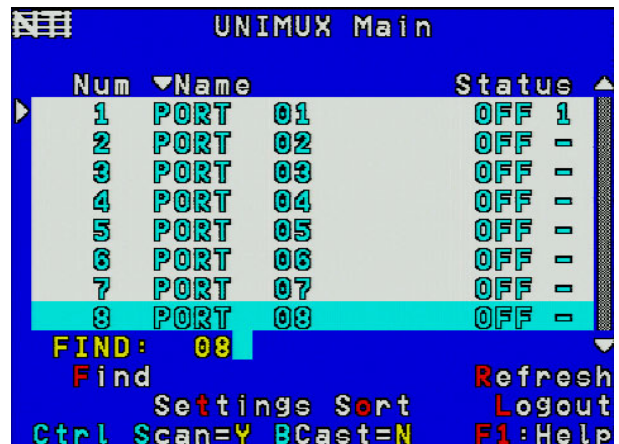


Figure 19- Find Mode in use

### Help Mode

To enter Help Mode press the <F1> key from the Command Mode menu (see page 13).

Help Mode displays a list of commands with a short explanation of their function. The following options allow the user to quickly obtain information on any command.

Function	Keystroke
View the previous page of help if available	Page Up
View the next page of help if available	Page Down
Exit Help Mode	Esc



Figure 20- Main Menu help screen

### Scan Mode

Using Scan Mode, the user can automatically switch from one CPU to another in predetermined configurable time intervals. The CPU ports to be scanned are easily selected provided the user has access to them. At initial startup, the user has access to all CPU ports by default.

To activate or deactivate Scan Mode press <Ctrl> + <s> from the Command Mode menu. The text shown in the menu (see Figure 16) will toggle between “Scan=N” and “Scan=Y”, each time the <Ctrl> + <s> keys are pressed. When “Scan=Y” is shown, Scan Mode is active. When “Scan=N” is shown, Scan Mode is OFF.

From the Settings menu (see page 18) press <s> to access the “Scan List”. The Scan List enables the user to select specific ports to be active in Scan Mode. While active, the user will have full device control of the connected port. Only the selected ports will be scanned in Scan Mode.

The “Scan List” is a check list with all the port numbers displayed

- unchecked box = the corresponding port is **not** in the scan list
- checked box = the corresponding port **is** in the scan list

From the “Scan List” the user can:

- toggle the state of the selected port (press <Spacebar>)
- select all ports to be scanned (press <A>)
- deselect all ports so that none are scanned (press <N>)
- find a specific port to either select or deselect (press <F> , then any alphabetical or numeric character to locate the desired port).



Figure 21- Scan List

A port is skipped from the scan cycle if one of the following conditions is true:

- the port is not in the Scan List
- Security Mode is enabled and the user does not have access rights to the port
- the CPU connected to the port is OFF

When switching to a new port the port name is displayed by OSD in the left upper corner of the monitor for 5 seconds or until a key is pressed or the mouse is moved, whichever comes first. The **scan dwell time** is programmable from 2 to 255 seconds (default time-out period is 5 seconds). While using the mouse, keyboard or touchscreen the scanned port becomes active and scanning is stopped. The switch will resume scanning after a period of user inactivity determined by the scan dwell time. See Settings Menu on page 18 for configuring the scan dwell time.

To return to the Settings menu, press <Esc>. The scan selection list is automatically saved.

**Note:** The scan dwell time set by the user affects all users.

**Note:** The keyboard, mouse and touchscreen must remain idle for the full scan dwell time before the switch selects the next active port.

**Broadcast Mode**

To activate or deactivate Broadcast Mode press <Ctrl> + <B> from the Command Mode menu. The text shown in the menu (Figure 16) will toggle between “BCast=N” and “BCast=Y”, each time the <Ctrl> + <B> keys are pressed. When “BCast=Y” is shown, Broadcast Mode is active. When “BCast=N” is shown, Broadcast Mode is OFF.

Broadcast Mode enables the user to type characters to more computers simultaneously. From the Settings menu (see page 18) press <B> to access the “Broadcast List” where the user can edit the list of ports that receive data in Broadcast Mode.

The “Broadcast List” is a check list with all the port numbers displayed

- unchecked box = the corresponding port is **not** in the broadcast list
- checked box = the corresponding port **is** in the broadcast list

From the “Broadcast List” the user can:

- select all ports to be broadcasted to (press <A>)
- deselect all ports so that none are broadcasted to (press <N>)
- select only a limited number of ports to be broadcasted to
- find a specific port to either select or deselect (press <F> , then any alphabetical or numeric character to locate the desired port).

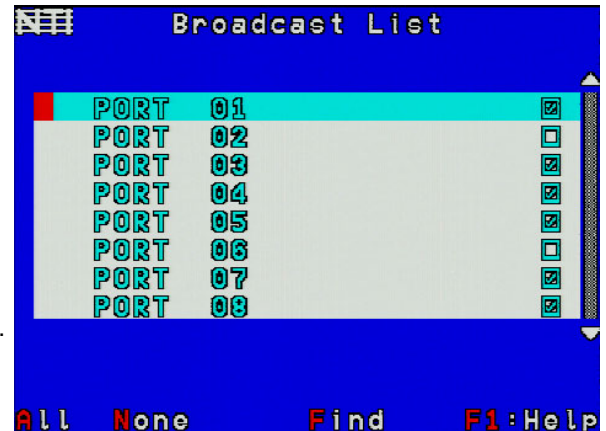


Figure 22- Broadcast List

A port doesn't receive broadcast data if one of the following conditions is true:

- the port is not in the Broadcast List
- Security Mode is enabled and the user does not have access rights to the port

**Note:** The user must type somewhat slowly when in Broadcast Mode (less than 20 wpm) and cannot use the <Backspace> key.

**Note:** The mouse and touchscreen will be disabled while in Broadcast Mode.

To return to the Settings menu, press <Esc>. The broadcast selection list is automatically saved.

**Normal Mode**

When the UNIMUX switch is not in Command, Scan, or Broadcast mode and the OSD control is not active on the monitor, the user is in Normal Mode, controlling the CPU to which the user is connected through the UNIMUX switch.

## Security

### Enabling Security

To enable the security feature the administrator must first enter Command Mode. If the Command Mode menu is not already displayed, press <Ctrl> + <~> (accent/tilde key). The OSD menu will automatically appear on the monitor.

To login as the administrator, the user must first logout by pressing <O>, and then <Y> to confirm. A login prompt will appear.

### Password and User Name

The factory settings are:

- default user name = <root>
- default password = <nti>

*Note: The username for the administrator cannot be changed from "root".*

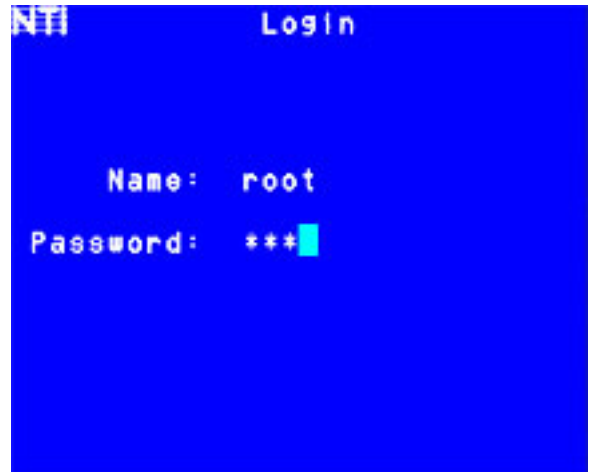


Figure 23- User login screen

*Note: The <F1> Autologin key (see Figure 25) is only for use by users other than the administrator, and is only displayed and available for use if security is not enabled.*

With a valid login, the user will be connected to the first CPU that is powered-ON. To enter Command Mode, press <Ctrl> + <~> (accent/tilde key). The OSD menu will automatically appear on the monitor.

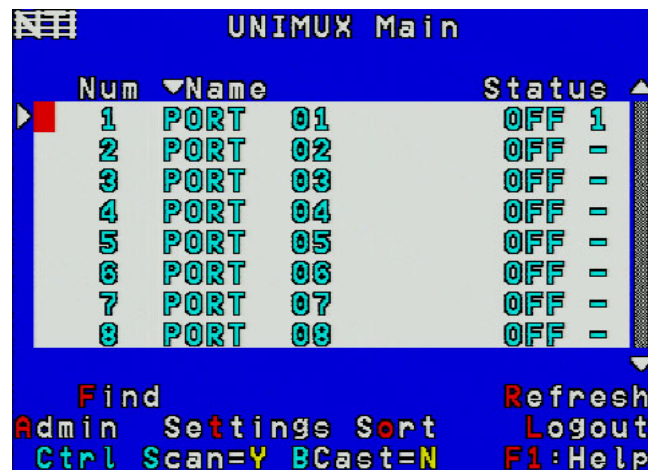


Figure 24- Administrator's main menu

The administrator will activate security (after logging in) by pressing <A>-<S>-<S>-<E> (see page 30).

Once logged-in, follow the instructions on page 23 for setting up users and changing the password. Once the password is setup, if it is lost or forgotten the administrator will have to contact NTI for assistance on clearing the password and set it up again. The administrator can setup each of the users and the limitations of their use of the individual CPUs using the administration menus.

When a standard user powers up the UNIMUX with security enabled, the login screen will appear. Enter the user name and password as set by the administrator. Unless a valid user name and password are entered, the login screen will remain on the monitor. For more on "User Login", see page 23.

## User Login

User Login Mode requires a user to login with a user name and password from the list created by the administrator. The user will only be able to login if security is enabled. With security enabled, the user will be locked to the current CPU and the login screen will remain on the monitor until the user logs in.

Function	Keystroke
Autologin (This is only available (but must be used when available) if security for the connected port is disabled)	F1 <i>See note below</i>
Add a character to the user name/password <i>See note below</i>	A-Z /0-9 or Shift + A-Z (upper and/or lower case characters)
Remove previous character from the user name/password	Backspace
Submit user name/password	Enter
Move from Name to Password field	Tab or Enter



Figure 25- User Login screen with security disabled

If the password submitted is incorrect, the user will not be able to proceed.  
If the password submitted is correct, the user will proceed to Normal Mode (see page 17).

Once a user name and password is accepted, the UNIMUX will connect to the first CPU that is powered-ON and the user has access to. To enter Command Mode, press <Ctrl> + <~> (tilde/accent key).

See the Command Mode functions described on page 15 to control the system of CPUs within the limitations as determined by the administrator.

**Note: If security is not enabled, the message "Press F1 to Autologin" will appear in the login screen. While security is disabled, a standard user must press <F1> (see Figure 25) to access the switch. Only the administrator can login using the name and password when security is not enabled.**

## Additional OSD Modes Available With Security Enabled

### Administration Menu

To access the Administration Menu press <A> from the Administrator's Main menu (see Figure 24). The Administration Menu can be accessed only when the administrator is logged-in. Users other than the administrator are not able to enter the Administration Menu.

If a different user is logged-in, log-out by pressing <L> from the Main menu, then log-in as Administrator. (See page 22, "Enabling Security".)

Administration Mode allows the administrator to use the following functions:

Function	Keystroke
Go to System Configuration menu	S
Go to Ports Configuration menu	P
Go to User Configuration menu	U
Change administrator's password	C
Display Usage Statistics	D
Ethernet Configuration	E
Exit from Administration Menu Return to Command Mode	Esc

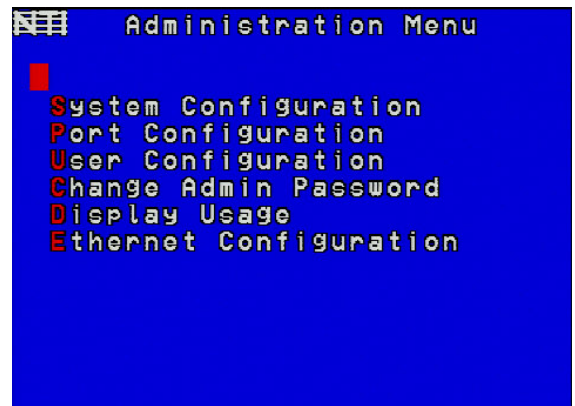


Figure 26- Administration Mode Menu

### System Configuration

To enter the System Configuration menu: press <S> from the Administration menu. The System Configuration menu can only be accessed when the administrator is logged-in.

Function	Keystroke
Change Idle Timeout	I
Change OSD Blank Timeout	O
Change Alternate Command Hot Key (See page 28 for details)	A
Reset the port names to default settings <b>*You will be prompted to confirm this selection*</b> <i>Note: The UNIMUX must be power cycled or the OSD Refreshed (main menu) for the reset to take effect.</i>	R
Configure the Keyboard Language	K
Open Security Configuration menu	S
Serial Baud Rate	B
Serial Address	E
Exit from System Configuration menu and return to Administration Menu	Esc

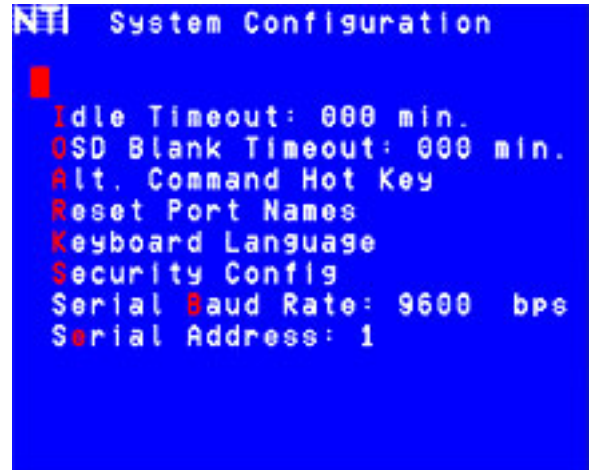


Figure 27- System Configuration menu

### Port Configuration

To enter the Port Configuration menu: press <P> from the Administration menu. The Port Configuration menu can only be accessed when the administrator is logged-in.

The port configuration screen is used to edit the names of ports and to configure ports to be compatible with MAC or non-MAC CPUs. If the port will have a MAC CPU connected, use the mouse to click on the box associated with the port to place a check mark in the box.

*Note: If a port is configured as connected to a non-MAC CPU, but is in fact connected to a MAC CPU, the mouse will still work as a generic mouse. No special functions provided by software drivers will be available.*

Function	Keystroke
Open an edit field for the selected port to rename the port (see Figure 28). Names of CPUs can be up to 12 characters in length. Characters typed can be upper or lower case. Press <Enter> a second time to save the changes.	Enter
Configure all ports for MAC CPU connection	A
Configure all CPUs for non-MAC CPU connection	N
Open field in which you can type characters to quickly locate a specific port to be configured	F
Toggle the selected port between MAC and non-MAC configuration	Spacebar
Open Help window for this topic	F1
Exit from System Configuration menu and Return to Administration Menu. All changes will be saved.	Esc

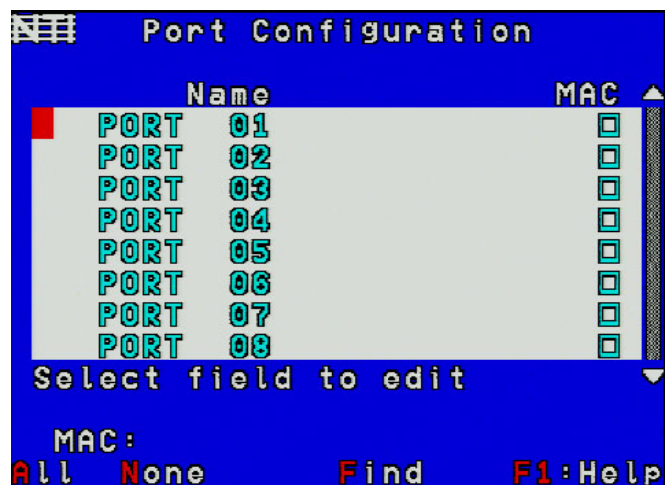


Figure 28- Port Configuration menu

- To save the change to characters in an edit field, press <Enter>.
- To exit an edit field without saving the changes, press <Esc>.

### User Configuration

To enter the User Configuration menu: press <U> from the Administration menu. The User Configuration menu can only be accessed when the administrator is logged-in.

The User Configuration screen lists the users configured to access the UNIMUX. Up to 63 users can be assigned access.

To assign a user name, password, and port access control, select the user number or an empty record and press <Enter>, <E>, or click it with the mouse.

Function	Keystroke
Select previous user in the list	up arrow
Select next user in the list	down arrow
Scroll to previous 8 names	Page up
Scroll to next 8 names	Page down
Edit account for selected user	E
Exit and return to previous menu	Esc

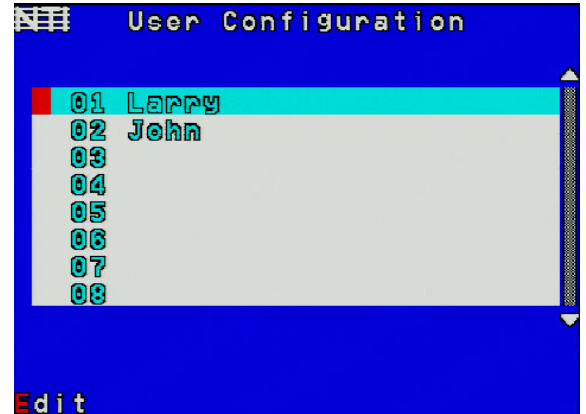


Figure 29- User Configuration

### Edit User Account

The User Account mode (see Figure 30) enables the administrator to:

- add a new user
- remove an existing user
- edit the settings for an existing user

Function	Keystroke
Place edit field around the name- enabling it to be edited If no name is entered, a default name "userXX" (where XX is the user number) will be entered	N
Open an edit field to insert a user password- up to 15 characters in length If no characters are entered, no password will be required for that user	P
Usable characters for Name or Password (Upper and lower case characters can be used)	A-Z /0-9 or Shift + A-Z
Open an edit field to confirm the password by retyping	C
Close an edit field	Enter
Open access control list for the user, to assign ports the user will be able to connect to  For new users, by default, no ports are user accessible unless selected by the administrator	A
Delete all account information for the selected user	D
Exit and return to previous menu Changes made will be saved automatically	Esc

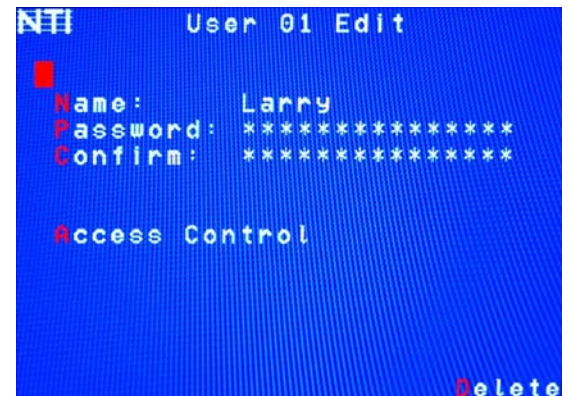


Figure 30- User Account menu

**Note:** To change the characters of a name while in the edit field, type the new characters or use the <Spacebar> to overwrite the existing characters. Pressing the <Delete> key will have no effect on existing characters and the <Backspace> key will only work if the cursor is at the end of the edit field. Use the <left arrow>, <right arrow>, <home> or <end> keys to move the cursor while in editable fields.

## User Access Control

To enter the Access Control list for a user, press A from the User Account screen for that user. From the Access Control list the administrator can:

- select all ports to have access to
- deselect all ports so that none can be connected to
- select only a limited number of ports to be accessed

The Access Control list is a check list with all the port numbers displayed

- unchecked box = the corresponding port is **not** in the access list
- checked box = the corresponding port **is** in the access list

Function	Keystroke
Toggle the state of the selected check box	Spacebar
Select the next or previous port	up or down arrow
Quickly place check marks in all boxes	A
Quickly remove check marks from all boxes	N
Open Help window for this topic	F1
Exit and return to previous menu	Esc
Changes made will be saved automatically	

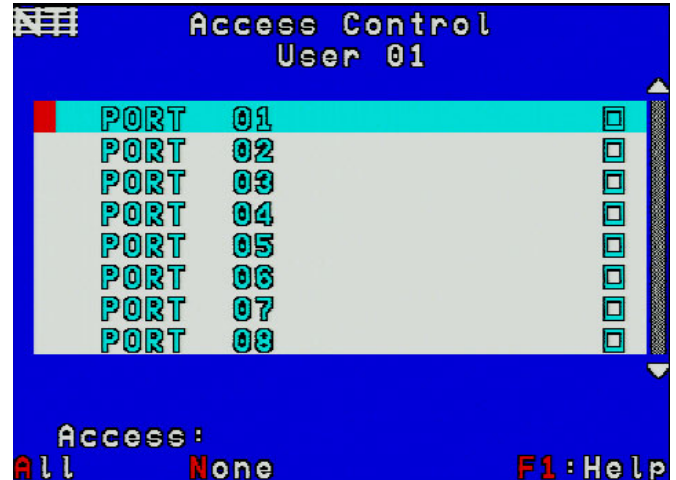


Figure 31- Access Control list

## Change Administrator Password

To change the Administrator Password, press <C> from the Administration menu.

The Admin Password menu (see Figure 32) enables the administrator to change his password. Two edit fields are available, one for password, the other for verify password. The password can be up to 15 characters in length.

**Note: The default password for the administrator is “nti”.**

Function	Keystroke
Switch between Password and Confirm (password) fields	Tab
Add character to password string or confirm string	A-Z, 0-9 (upper or lower case)
Delete previous character in edited string	Backspace
Save new password. (The administrator will be prompted for a Yes or No confirmation)	S
Exit and return to previous menu	Esc

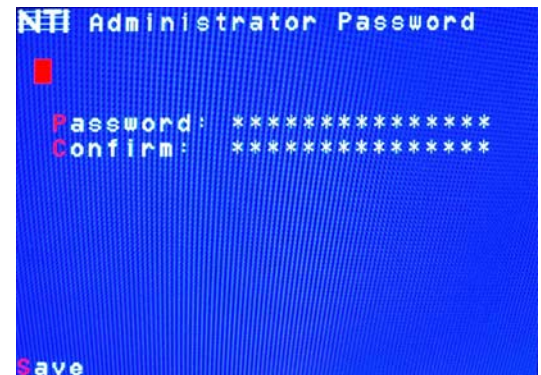


Figure 32- Administrator password menu

**Note: If the confirmation password does not match the first password entered, the message “INVALID PASSWORD” will be displayed when you try to save it.**



## Display Usage

To display usage statistics for the UNIMUX, press <D> from the Administration menu.

The Display Usage page shows the user how many times the UNIMUX has been power cycled and how many total hours it has been powered ON. The counters for these statistics can be reset to 0 by pressing <F7> to reset the number of power cycles or <F8> to reset the hours of usage.

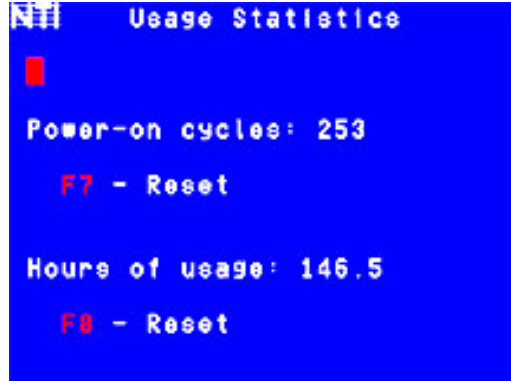


Figure 33- Usage Statistics Page

## Ethernet Configuration

To configure the ETHERNET port settings on the UNIMUX for controlling the switch via Telnet Interface (page 40), press <E> from the Administration menu. The default values are shown in Figure 34.

Function	Keystroke
Change the IP Address	I
Change the Subnet Mask	S
Change the Gateway	G
Change the port number	T
Exit and return to previous menu	Esc

Network settings can also be changed using the NTI Discovery Tool. See page 45.



Figure 34- Ethernet Configuration

If the Ethernet feature is not present in the UNIMUX, the message "Ethernet Card Not Present" will appear at the bottom of this menu in Figure 34.

If the Ethernet port is present but not connected, the message "Ethernet Card Present, Status: Not Connected" will appear at the bottom of the Ethernet Configuration menu (Figure 34).

**Note: The Ethernet port is not available when the CAT5 option is present.**

## Idle Timeout

The idle timeout is the amount of time that the user can be idle while in Command Mode before the user is automatically logged out. The idle timeout can be set to any value from 000 to 255 minutes. A value of 000 will disable it. After the idle timeout period has elapsed, the login screen will appear.

To change the Idle Timeout setting,

1. press <I> from the System Configuration menu (page 24) to display the edit field around the value (see Figure 35)
2. enter the desired value (000-255 minutes)
3. press <Enter> to save it and move to the next field
4. press <Esc> to exit the System Configuration menu



Figure 35- Change value of Idle Timeout

## OSD Blank Timeout

The OSD Blank Timeout is the amount of time that the user can be idle while in Command Mode before the OSD menu will disappear. The time period can be set to any value from 000 to 255 minutes. A value of 000 will disable it. After the OSD disappears when the configured time period has elapsed, the user can make it reappear by either pressing a key on the keyboard or moving the mouse.

To change the OSD Blank Timeout setting,

1. press <O> from the System Configuration menu to display the edit field around the value (see Figure 36)
2. enter the desired value (000-255 minutes)
3. press <Enter> to save it and move to the next field
4. press <Esc> to exit the System Configuration menu

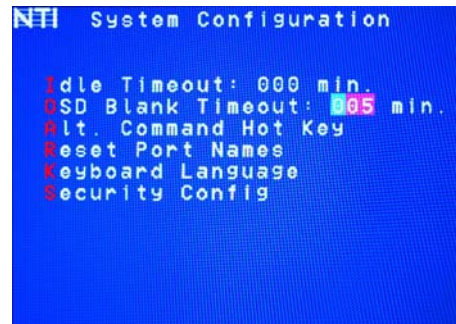


Figure 36- Change the value of OSD Blank Timeout

## Alternate Command Hot Key

To enable the administrator to assign a key in addition to the <`> (accent/tilde key) to use with <Ctrl> to enter into OSD Command Mode, an Alternate Command Hot Key option is provided. The default factory setting for this option is <`> (disabling the option).

To select an Alternate Command Hot Key, press <A> from the System configuration menu (page 23). A window will open and the administrator will be prompted to press a key. Any key **except** Ctrl, Shift, Alt, Tab, Esc, or Enter can be used. After pressing the key, a confirmation message will appear. The administrator should press <Y> (Yes) to validate the key as the Alternate Command Hot Key, or <N> (No) to select another key.

Pressing <Esc> will return to the Administration Mode menu.

Only the administrator is able to set or change the Alternate Command Hot Key. This function must be set individually for each of the USB User Device ports on the UNIMUX USB KVM switch.

**Note: The Alternated Command Hot Key does not replace the <`> (accent) key, it just works as another way to enter into Command Mode. After setting it, the user can enter into Command Mode either with <Ctrl> + <`> or with <Ctrl> + <Alternate Command Hot Key> combination. To disable it, the administrator should set <`> as the Alternate Command Hot Key.**

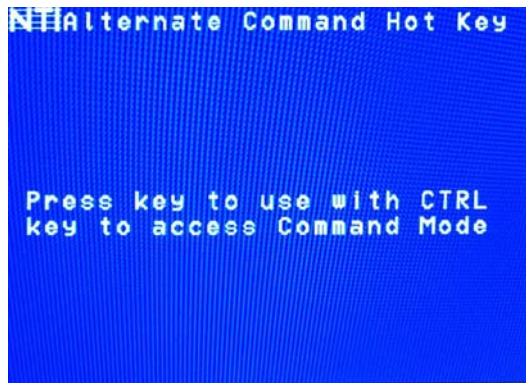


Figure 37- Alternate Command Hot Key selection window

**Reset Port names**

To erase all configured port names and return them to the factory-default names, press <R> from the System Configuration menu. After pressing the key, a confirmation message will appear. The administrator should press <Y> (Yes) to validate the selection or <N> (No) to cancel it.

Pressing <Esc> will return to the Administration Mode menu.

The switch must be power cycled for the reset to take effect.

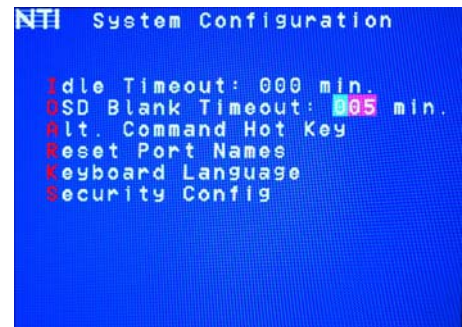


Figure 38- Press "R" to reset port names

**Select Keyboard Language**

To enter the Select Language menu (see Figure 39) press K from the System Configuration menu described on page 24. Only the administrator has the Select Language menu option.

The Select Language menu enables the administrator to select a specific keyboard language (country code) to be used. Typically only SUN CPUs require a specific country code to be registered at boot up. (For other types of CPUs this feature may have no effect.) A list of available languages is displayed and can be scrolled using the mouse (scroll wheel) and/or <up arrow>, <down arrow>, <Home> and <End> keys.



Figure 39- Select Language menu

- To manually program a specific language, select a language and press <Enter> (or click the left mouse button).
- To automatically detect the language of the keyboard, select "AutoDetect" and press <Enter> (or click the left mouse button) . The list will advance to the actual detected keyboard language and that language will be programmed.

Some keyboards don't have a country code. In this case the selection will remain in the "AutoDetect" position and the default country code "00" will be programmed in the UNIMUX. If a specific country code is manually programmed, it will be the country code for the switch, regardless of the actual country code of the connected keyboard. The programmed country code is saved in memory and restored each time the UNIMUX is powered-ON. Because the CPUs that use country code (i.e. SUN CPUs) read it at boot time, it is necessary to boot the CPU(s) after programming the country code.

## Security Configuration

The UNIMUX can be configured to either have no security enabled such that any user can connect to the UNIMUX, or have security enabled such that a user must have a login name and password in order to enter Command Mode and make a connection with an accessible CPU. Only the administrator has access to Security Configuration.

Within Security Configuration, the administrator has three options:

Function	Keystroke
Enable security just for the user port that his currently connected through	U
Enable Global Security- security enabled on all user ports	E
Disable Global Security- security disabled on all user ports	D
Return to previous menu	Esc



Figure 40- Security Configuration

If Security is disabled and the user attempts to login to Command Mode with the command key, the login screen will include the instruction "Press F1 to Autologin".

With security disabled, Autologin provides full access to all connected CPUs and all users except the administrator must use it to login.

When security is enabled, Autologin is not available and the user must login using the administrator assigned user name and password. The user will have access to only those CPU ports as configured by the administrator.



Figure 41- Login screen with security disabled

## Serial Baud Rate

The serial baud rate for the UNIMUX can be changed by pressing <B> from the System Configuration menu. In order to control the UNIMUX via RS232 (page 34), the baud rate must be set the same as the communication port on the control terminal attached to the UNIMUX (page 9)

The baud rate value can be set to 115000, 57600, 38400, 19200, 9600, 4800, 2400, or 1200. A data protocol of 8 data bits, no parity, and 1 stop bit is used for communications. With the edit field highlighted, press the <Left arrow> or <Right arrow> to change the value of the baud rate.

**Note:** The baud rate can also be changed from the RS232 Command Protocol (see page 34).

For more on RS232 Control, see page 34.



Figure 42- Adjust Baud Rate

## Serial Address

To allow multiple UNIMUXs to be controlled from a single control terminal, the RS232 control interface is designed to allow "daisy chaining" up to 15 units. Each unit must be assigned a unique address. The unit address for the UNIMUX can be changed by pressing <E> from the System Configuration menu. With the edit field highlighted, press the <Left arrow> or <Right arrow> to change the value of the unit address. The address range is 1-15. For more on daisy chaining, see page 34.

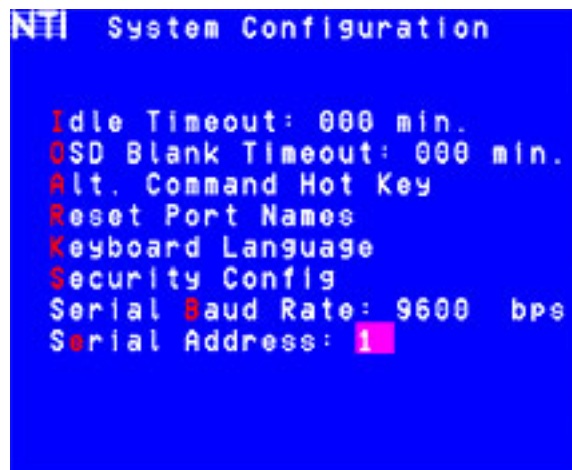


Figure 43- Adjust Serial Address

## Keyboard Mapping

The keyboard configuration of each CPU is saved in the UNIMUX switch. For example, if the CPU attached to Port 4 had CAPS LOCK and NUM LOCK selected the last time that CPU was accessed, then they will automatically be set when that CPU is accessed again.

## Key Equivalents


Using the chart below, find the character needed to be typed on the CPU being accessed, then follow the row across for the equivalent on the keyboard being used. (See Figure 44 on page 33 for reference.)

USB 101	WINxx	MAC (Apple USB)	SUN
L-Ctrl	L-Ctrl	L-Ctrl	L-Ctrl
L-Alt	L-Alt	L-Option	L-Alt
SB+F12	Application	SB+F12	Compose
R-Alt	R-Alt	R-Option	Alt-Graph
SB+Alt	Windows Logo	Command	Meta
SB+R Arrow	SB+R Arrow	Power	Suspend

SB = Space Bar

L and R = Left and Right keys when two keys are marked the same on a keyboard.

## Mouse Click Equivalents

To emulate a right button click using Apple 1 button mouse, hold down the Command key (  ) while pressing the mouse button.

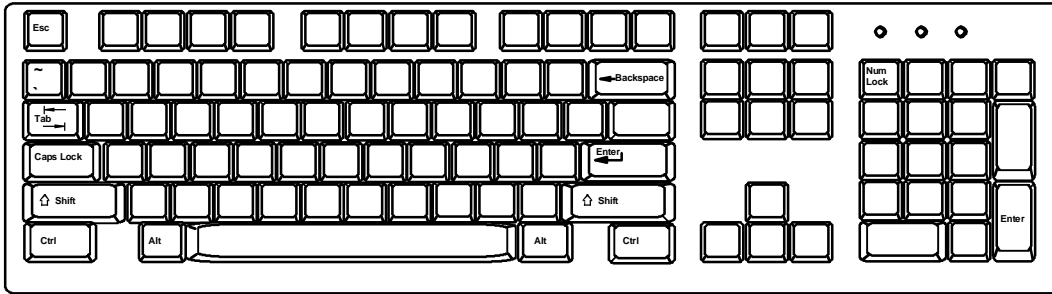
**Note:** Right mouse button emulation must be enabled (see Settings on page 18) for this to work.

## SUN's 16 Extra Keys

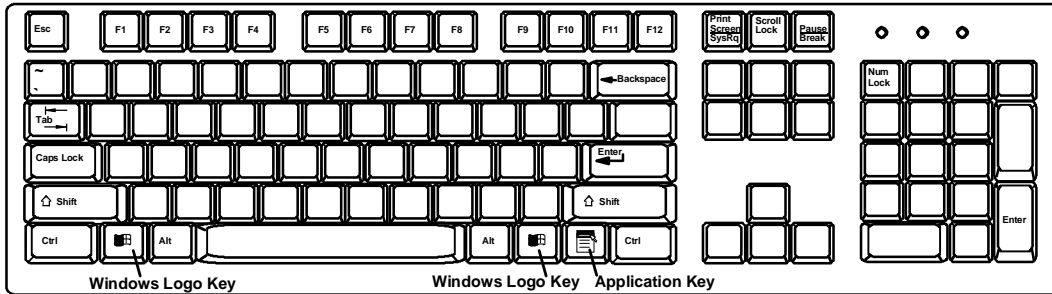
101, WINxx, MAC Keyboards	SUN Extras
SB+F1	Stop (L1)
SB+F2	Again (L2)
SB+F3	Props (L3)
SB+F4	Undo (L4)
SB+F5	Front (L5)
SB+F6	Copy (L6)
SB+F7	Open (L7)
SB+F8	Paste (L8)
SB+F9	Find (L9)
SB+F10	Cut (L10)
SB+F11	Help
SB+F12	Compose
SB + Up Arrow	Vol +
SB + Down Arrow	Vol -
SB + L Arrow	Mute
SB + R Arrow	Suspend

Use the chart to the left to type SUN's additional 16 keys using a 101, WINxx, or MAC (Apple) USB keyboard

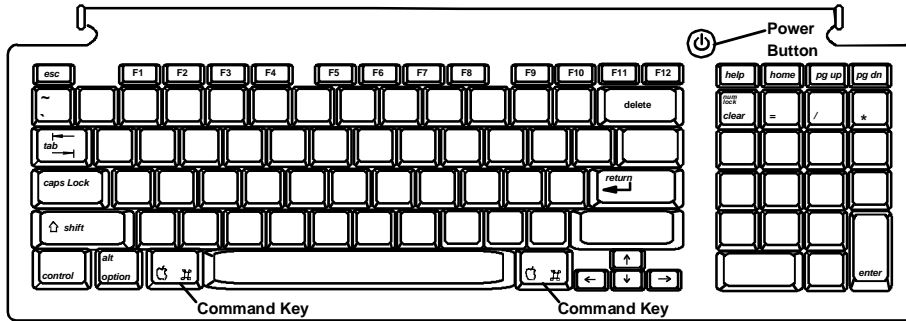
SB= Space Bar



Typical 101 Keyboard



Windows Keyboard



Apple USB Keyboard



SUN USB Keyboard

Figure 44- Keyboard layouts

## SUN RAY SUPPORT

The UNIMUX fully supports SUN Ray CPUs, however, a lack of horizontal mouse movement may be experienced. If this occurs, enable MAC mode (page 24) for the port that the SUN Ray is connected to. This should enable proper mouse movement.

## RS232 CONTROL

RS232 enables the UNIMUX to be remotely controlled via RS232. To control the UNIMUX via RS232 the user has three options:

- write a program that runs on a PC using the Command Protocol (page 36)
- use the NTI Switch Control Program (page 37) provided on the CD
- use the SerTest or RMTEST programs (pages 37 and 39) provided on the CD

### Remote Connection

The RS232 Interface is designed to meet the RS232C standard and can be controlled from any CPU or other controller with an RS232 communications port. The pin-out for the RJ45 connector on the unit is as follows:

#### RS232 (RJ45) CONNECTOR

PIN	SIGNAL	FUNCTION
1	-	No connection
2	-	No connection
3	RX+	Receive data (TXD at host)
4	GND	Ground
5	-	No connection
6	TX+	Transmit data (RXD at host)
7	-	No connection
8	-	No connection

**NOTE: Security must be disabled or user access granted on the port(s) to be selected by RS232 control.**

A 5 foot patch cable and two adapters, RJ45-to-DB9 and RJ45-to-DB25, have been provided for connection to most CPUs (see page 9). To daisy chain multiple units, connect a Matrix-Y-1 cable (sold separately) between the CPU and the first switch, and between each switch (as shown in Figure 45).

### Baud Rate

The baud rate can be changed using the OSD menu (page 34) or from the RS232 commands (page 36). The baud rate can be set to 115000, 57600, 38400, 19200, 9600, 4800, 2400, or 1200. A data protocol of 8 data bits, no parity, and 1 stop bit is used for communications.

### Unit Address and Loop Back

To allow multiple units to be controlled from a single host port, the RS232 control interface is designed to allow "daisy chaining" up to 15 units using an NTI Matrix-Y-1 cable. Connect the Matrix-Y-1 cable between the RJ45-to-DB9 serial adapter and the CPU as shown in Figure 45. By setting the appropriate unit address (page 34), each unit can be given a unique address (1-15). Then the unit will only respond to commands on the bus if its address is embedded in the command.



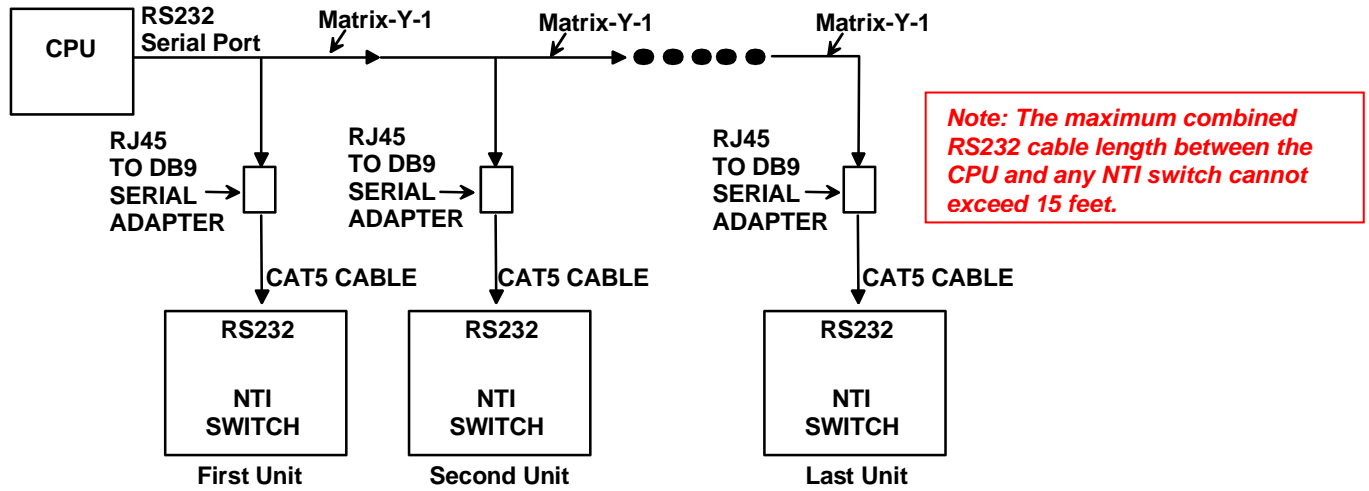


Figure 45- RS232 connection with Matrix-Y-1 cable

**Wiring Schematic of Matrix-Y-1 cable**

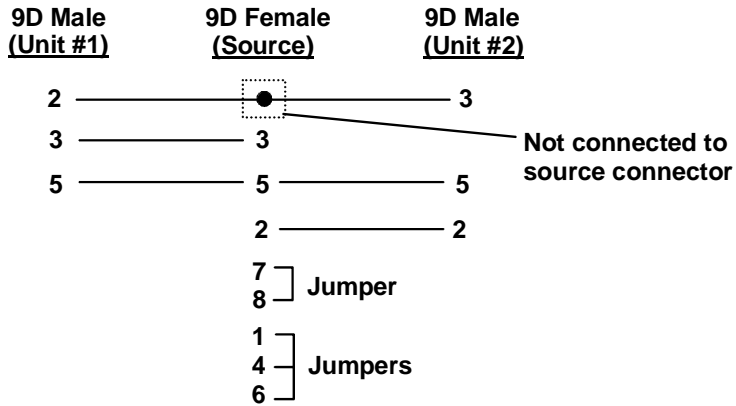


Figure 46- Pinout of Matrix-Y-1 cable

## RS232 Command Protocol

Host controller commands supported by the unit are defined below.

### RS232 Command Protocol Quick Reference

Legend: (All numbers must be two digits)

SW : Switch (01-15)

IP : Input Port/CPU (01-MAXINPUTS)

BR : Baud Rate Code

<CR>: Carriage Return (Hex 0xD)

OP : Output/User Port

Command String	Good Response	Description
CS SW,IP,OP	*<CR>	Connect one User port To CPU port
RO SW,OP	*<CR>IP<CR>	Read Connection For User Port
CB 00,BR	None	Change Baud Rate For All Switches BR = 12 (1200), 24 (2400), 48 (4800), 96 (9600), 19 (19200), 38 (38400), 57 (57600), 11(115000) (9600 is the default)
RV SW,00	*<CR>string\0<CR>	Read NTI Version String
RU SW	*<CR>IP,OP<CR>	Read Unit Size
SS SW,00	*<CR>	Disable Autostatus feature (see below)
SS SW,01	*<CR>	Enable Autostatus feature (see below)
GM SW,00	*<CR>go SW OP IP<CR> (all connections)	List all switch User port connections; all User ports to all CPU ports
RP SW,IP	*<CR>	Refresh Communication with CPU USB port

If the first field is not a known command (as listed above) or SW field is different from the serial address programmed in the switch memory, the command will be ignored. If the SW field corresponds to the serial address, but the syntax is wrong after this field, the switch will answer with ?<CR>.

Syntax example:

CS 01,05,01<CR> (insert the space and commas as shown)

which means "At the switch with unit address 01, connect CPU port 05 to user port 01"

The switch will answer with:

\*<CR>

The HEX code representation of example above is:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'C' (0x43)	'S' (0x53)	Space (0x20)	Switch – 1st digit (0x30)	Switch – 2nd digit (0x31)	',' (0x2C)	Output – 1st digit (0x30)	Output – 2nd digit (0x35)	',' (0x2C)

Byte 10	Byte 11	Byte 12
Input –1st digit (0x30)	Input –2nd digit (0x31)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

**WARNING:** When using RS232 to control the UNIMUX while a flash drive is in a transparent USB port (where applicable), you should eject the USB device within the operating system at the connected CPU before switching ports using an RS232 command. Otherwise, the flash drive could get corrupted.

### Autostatus

When Autostatus is enabled, any output-to-input connection change in the UNIMUX will cause an Autostatus message to be sent via RS232 to the administrator. The format of the message would be "pc SW,OP:IP<CR>"

Example of an Autostatus message:

```
pc 01,01:04<CR>
```

which means "At the switch with unit address 01, the output (01) has changed connection to input 04."

**Notes: Message to the administrator will be delayed by any RS232 traffic being received by the switch from the administrator.**

**Autostatus must be disabled before using SerTest or the NTI Switch Control Program (below).**

By default, Autostatus is disabled and must be manually enabled. Autostatus is also disabled any time the power to the UNIMUX is interrupted.

### NTI Switch Control Program For Windows 9X, NT, 2000, XP, Vista and 7

The NTI Switch Control Program is an easy and powerful graphical program that controls NTI KVM switches through an RS232 interface. The NTI Switch Control Program is included on the CD packaged with the UNIMUX. The NTI Switch Control Program is downloaded by clicking on the link "Download NTI Switch Control Program" found on the webpage the opens when the CD is inserted into the CDROM drive.

To install the NTI Switch Control Program after downloading

1. Locate the **Setup.exe** in the directory the program was downloaded to and double-click on it
2. Follow the instructions on the screen

**Note: In order to use the NTI Switch Control Program to control the UNIMUX, the UNIMUX RS232 port must be set at a baud rate of 9600 bps (see page 34).**

The NTI Switch Control Program performs best on monitors set to a screen resolution of at least 800 X 600. Instruction for using the NTI Switch Control Program is available by opening "MSCP Help" in the "NTI" program group once the program has been installed and is open on the screen.

To open "MSCP Help" from the Windows desktop

1. Click on **START**
2. Click on **PROGRAMS**
3. Click on **NTI**
4. Click on **MSCP Help**

## SerTest- RS232 Interface Test Program

This software allows a user to test the functions of an NTI server switch, matrix switch or Multi-user/Multi-platform switch RS232 interface. The program SERTEST along with the NTI Switch Control Program (page 37) is installed from the CD packaged with this switch. SERTEST generates a main menu with the selections described below:

### Main Options

- Matrix Operations - send commands to the matrix unit.
- Ethernet Operations - set Ethernet connection variables (not applicable to this product)
- Setup Options - set COM port, baud rate, and unit address
- About SerTest - display the program version

### Matrix Operations

Key	Selection	Description
1)	Connect Output/User to an Input/CPU	- connect an output to an input
2)	Connect All Outputs/Users to an Input/CPU	- connect all outputs to an input
3)	Connect Audio Output/User to an Input/CPU	- connect an output to an input (audio ports only)
4)	Connect All Audio Outputs/Users to an Input	- connect all outputs to an input (audio ports only)
5)	Change Mute Status for Audio Output/User	- mute or un-mute the Audio port output
6)	Change Volume for Audio Output/User	- change Audio port output volume
7)	Read Connection for Video Output/User	-read the connection of a specific video output
8)	Read Connection for Audio Output/User	-read the connection of a specific audio output
9)	Read Mute and Volume for Audio Output/User	- read the volume and the mute status of the specified output (audio ports only)
a)	Save I/O Connections into Unit Memory	-save the connections into switch memory bank
b)	Restore I/O Connections from Unit Memory	-restore the connections from switch memory bank
c)	Change All Units Baud Rate (9600/COM1:)	-change RS232 Baud rate of all switches -the current baud rate and serial port are displayed in parentheses
d)	Reset Unit	- send a reset command to the switch (This command does not function at this time)
e)	Reset All Units	- send an internal reset command to all switches
f)	Read Unit Size	- read the switch size (number of inputs and outputs)
g)	Read Unit Version/Revision String	-read a string containing the switch version, type, and size
h)	Save All Units I/O Connections into Units Memory	-save the connections into switch memory bank, command for all switches
i)	Restore All Units I/O Connections from Units Memory	-restore the connections from switch memory bank, command for all switches

Selections in the "Key" column that are gray are not applicable to this product.

### Setup Options

Key	Selection	Description
1)	select Com port current: (COM1:)	- select PC serial port - the current PC serial port is displayed in parentheses
2)	select Baud rate current: (9600)	- select PC serial port baud rate - the current baud rate is displayed in parentheses
3)	set unit Address current: (1)	- select the unit address - the current address is displayed in parentheses

For any selection that requires user input, the user is prompted. When commands are sent to the matrix unit, the command string and matrix unit responses are echoed to the screen. All commands generated by the program are formatted according to the information provided in sections above. If any transmission problems are detected, an error message is displayed.

Press <Esc> or <Enter> to back out to the main menu and press again to exit.

## RMTEST-RS232 Interface Test Program

This software also allows a user to test the functions of an NTI server switch, matrix switch or Multi-user/Multi-platform switch RS232 interface. The RMTEST program is automatically loaded when installing the NTI Switch Control Program as described on page 37. The RMTEST program, located in the NTI program group, generates a main menu with the 3 selections described below:

### MAIN OPTIONS

1. Matrix Options - send commands to the matrix unit.
2. Setup Options - set COM port, baud rate, and unit address
3. Quit - quit the program

If Matrix Options is selected, the following menu, which has 7 options, is displayed:

### MATRIX OPTIONS

1. Reset single unit - reset single matrix to power-up defaults (matrix switch only)
2. Reset all units - reset all daisy chained matrix units (matrix switch only)
3. Change single output - connect an input to one output
4. Change all outputs - connect an input to all outputs
5. Read single output - read which input is connected to an output
6. Read unit size - read how many inputs and outputs the unit has
7. Return to main menu - go back to the MAIN OPTIONS menu

The Setup Options main menu selection only needs to be executed if the switches baud rate or unit address have been changed from the factory defaults (9600 baud, and unit address = 1). When this option is selected, the following menu, which has 4 options, is displayed:

### SETUP OPTIONS

1. Set COM port (default = COM1) - set port to COM1-COM3
2. Set baud rate (default = 9600) - set baud rate (see interface manual for supported baud rates)
3. Set unit address (default = 01) - set the unit address (if multiple units are daisy-chained)
4. Return to main menu - Go back to the MAIN OPTIONS menu

For any selection that requires user input, the user is prompted. When commands are sent to the matrix unit, the command string and matrix unit responses are echoed to the screen. All commands generated by the program are formatted according to the information provided in the sections above. If any transmission problems are detected, an error message is displayed.

## TELNET INTERFACE

The UNIMUX can be controlled via Telnet interface by connecting to the UNIMUX through port 2005 (configurable-page 27).

**Note: The Telnet Interface is not available when the CAT5 option (page Error! Bookmark not defined.) is present.**

The Telnet Interface enables the user to control the switch using a telnet client through an Ethernet connection (page 10). The telnet server listens on port 2005. For telnet control using the telnet interface and the current IP address, type the following in a command shell:

(If default IP address (used in the command below) or port number has been changed (page 27), substitute the current value.)

**telnet 192.168.1.25 2005**

Use the command set below to control and acquire information from the UNIMUX.

**Legend:** (All numbers must be two digits)

- OP : Output Port (01)
- IP : Input Port (01-MAXINPUTS)
- <CR> : Carriage Return (Hex 0xD)
- NN : Connection configuration reference number (00-99)

### Command Summary

Command String	Good Response	Description
RU<CR>	ru OP,IP<CR>	Read unit size
RO OP<CR>	pc OP,IP<CR>	Read connection for OP
CS OP,IP<CR>	*<CR>	Connect OP to IP
CA IP<CR>	*<CR>	Connect all outputs to IP
SS 01<CR>	*<CR>	Enable auto-status mode
SS 00<CR>	*<CR>	Disable auto-status mode
SX<CR>	See details	Examine connections
CC NN<CR>	*<CR>	Save Connections
RC NN<CR>	*<CR>	Read (Load) Connections
RP IP<CR>	*<CR>	Refresh Communication with CPU USB port
XX<CR>	*<CR>	Close connection

**WARNING:** When using Telnet to control the UNIMUX while a flash drive is in a transparent USB port (where applicable), you should eject the USB device from within the operating system at the connected CPU before switching ports using a Telnet command. Otherwise the flash drive could get corrupted.

A <CR> (carriage return, 0x0D) is considered to be the end of the command string. If a string exceeds 16 characters, an end of string will be inserted automatically to avoid buffer overflow. An eventual <LF> (line feed, new line, 0x0A) after a <CR> will be ignored. A bad string will always be responded to with the ASCII character '?' followed by a <CR>.

## Command Detail

### RU-Read Unit Size

Command:

Byte 1	Byte2	Byte3
'R' (0x52)	'U' (0x55)	<CR> (0x0D)

Response:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'r' (0x72)	'u' (0x75)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output-2nd digit (0x30...0x39)	',' (0x2C)	Input – 1st digit (0x30...0x32)	Input – 2nd digit (0x30...0x39)	<CR> (0x0D)

This command will read the size of the unit. The response returns the number of inputs and the number of outputs in two-digit, ASCII code format. If the numbers are smaller than 10, the 1st digit is '0'.

### RO-Read Connection for Output Port

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'R' (0x52)	'O' (0x4F)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output – 2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'p' (0x70)	'c' (0x63)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output-2nd digit (0x30...0x39)	',' (0x2C)	Input – 1st digit (0x30...0x32)	Input – 2nd digit (0x30...0x39)	<CR> (0x0D)

This command will read the connection of an output port. The response returns the output port that is connected to the input port.

### CS- Connect Output Port to Input Port

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'C' (0x43)	'S' (0x53)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output – 2nd digit (0x30...0x39)	',' (0x2C)	Input –1st digit (0x30...0x32)	Input –2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command connects the specified input port to the specified output port.

### CA- Connect All Output Ports to Input Port

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'C' (0x43)	'A' (0x41)	Space (0x20)	Input – 1st digit (0x30...0x32)	Input - 2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command connects all output ports to the specified input port.

### SS\_01- Enable Auto Status Mode

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'S' (0x53)	'S' (0x53)	Space (0x20)	'0' (0x30)	'1' (0x31)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

Auto status mode is disabled by default whenever the connection is established, and this command must be entered to enable it. When auto status mode is enabled, a message will be sent whenever an input/output connection changes from any source. The format of this message is given in the table below. The first two numeric digits are the output port number and the two after the colon are the number of the input port that is now connected to it.

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'p' (0x70)	'c' (0x63)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output – 2nd digit (0x30...0x39)	':' (0x3A)	Input – 1st digit (0x30...0x32)	Input – 2nd digit (0x30...0x39)	<CR> (0x0D)

### SS\_00- Disable Auto Status Mode

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'S' (0x53)	'S' (0x53)	Space (0x20)	'0' (0x30)	'0' (0x30)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command disables auto status mode.



### SX- Examine connections

Command:

Byte 1	Byte 2	Byte 3
'S' (0x53)	'X' (0x58)	<CR> (0x0D)

Response:

Multiple lines, one line for each output:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'p' (0x70)	'c' (0x63)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output – 2nd digit (0x30...0x39)	':' (0x3A)	Input – 1st digit (0x30...0x32)	Input – 2nd digit (0x30...0x39)	<CR> (0x0D)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9
'p' (0x70)	'c' (0x63)	Space (0x20)	Output – 1st digit (0x30...0x32)	Output – 2nd digit (0x30...0x39)	':' (0x3A)	Input – 1st digit (0x30...0x32)	Input – 2nd digit (0x30...0x39)	<CR> (0x0D)

Last line:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

### CC- Save connection configuration into permanent memory at given location

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'C' (0x43)	'C' (0x43)	Space (0x20)	Location – 1st digit (0x30...0x32)	Location - 2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command saves the current connection configuration into permanent memory for further use. Up to 100 configurations can be stored

### RC- Read connection configuration from permanent memory at given location

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'R' (0x52)	'C' (0x43)	Space (0x20)	Location – 1st digit (0x30...0x32)	Location - 2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command loads the connection configuration from permanent memory into current configuration. Up to 100 configurations can be stored

**RP- Refresh Communication with CPU USB Port**

Command:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
'R' (0x52)	'P' (0x50)	Space (0x20)	Input –1st digit (0x30...0x32)	Input –2nd digit (0x30...0x39)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

This command will refresh the USB communication with the CPU in cases where the USB port will be put in standby by the operating system.

**Terminate telnet session**

Command:

Byte 1	Byte 2	Byte 3
'X' (0x58)	'X' (0x58)	<CR> (0x0D)

Response:

Byte 1	Byte 2
'*' (0x2A)	<CR> (0x0D)

The unit will respond with '\*'<CR> and close the connection, terminating the telnet session. The unit is then available for future connections.

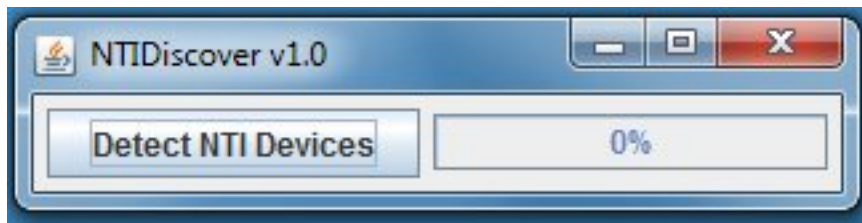
## DEVICE DISCOVERY TOOL

In order to easily locate NTI Devices on a network, the NTI Device Discovery Tool may be used. A link to the Discovery Tool is provided on the web page that appears when you insert the instruction manual CD provided into your CD ROM drive. Either click on the link or browse the CD to locate the `NTIDiscover.jar` file. The Discover Tool can be run from the CD or it can be saved to a location on your PC. Either way, to open it just double-click on the file `NTIDiscover.jar`. This will open the NTI Device Discovery Tool.

**Note:** The Device Discovery Tool requires the Java Runtime Environment (version 6 or later) to operate. A copy of Java version 6 is provided on the CD and a link to the web page from which it can be downloaded and installed is also on the CD.

**Note:** The computer using the Device Discovery Tool and the NTI Device must be connected to the same physical network in order for the Device Discovery Tool to work. If no devices are found, the message “No Devices Found” will be displayed.

**Tip:** If your Windows program asks which program to open the `NTIDiscover.jar` file with, select the Java program.



**Figure 47- Device Discovery Tool**

Click on the “**Detect NTI Devices**” button to start the discovery process. After a short time, the tool will display all NTI devices on your network, along with their network settings.

Device	MAC Address	IP Address	Mask	Gateway		
ENVIROMUX-SEMS-16	00:0C:82:03:03:E8	192.168.3.80	255.255.255.0	192.168.3.3	Submit	Blink LED
ENVIROMUX-5D	00:0C:82:10:00:05	192.168.3.25	255.255.255.0	192.168.3.3	Submit	Blink LED
IPDU-Sx	00:0C:82:08:00:B2	192.168.3.85	255.255.255.0	192.168.3.3	Submit	Blink LED
ENVIROMUX-2DB	00:0C:82:0E:00:08	192.168.3.83	255.255.255.0	192.168.3.3	Submit	Blink LED
VEEMUX-MXN-C5AV	00:0C:82:09:00:25	192.168.3.82	255.255.255.0	192.168.3.3	Submit	Blink LED
VEEMUX-DVI	00:0C:82:07:01:8B	192.168.3.86	255.255.255.0	192.168.3.3	Submit	Blink LED
Submit All    Refresh    Close						

The “**Blink LED**” button is not supported on the UNIMUX

### How to Use the Device Discovery Tool

**To Change a Device’s Settings,** within the row of the device whose settings you wish to change, type in a new setting and click on the **Enter** key, or the **Submit** button on that row. If the tool discovers more than one device, the settings for all devices can be changed and you can click on the **Submit All** button to submit all changes at once.

**To Refresh the list of devices,** click on the **Refresh** button.

**To Blink the LEDs of the unit,** click on the **Blink LED** button (**This feature is not supported on the UNIMUX.**) The **Blink LED** button will change to a “**Blinking....**” button. The LEDs of the unit will blink until the **Blinking...** button is clicked on, or the NTI Device Discovery Application is closed. The LEDs will automatically cease blinking after 2 hours.

**To Stop the LEDs of the unit from blinking,** click on the **Blinking...** button. The **Blinking....** button will change to a **Blink LED** button.

## FIRMWARE UPGRADE PROCEDURE

This procedure describes how to upgrade the firmware in this UNIMUX switch. If you are not certain whether this UNIMUX has the most up-to-date firmware available, see page 51 for instruction on how to determine what version the UNIMUX has. All versions of firmware can be downloaded from the NTI firmware download website at <http://www.networktechinc.com/download/d-srvsw-usbu-hd.html>.

The UNIMUX switch has 3 types of micro-controllers:

1. Main User Controller – there is only one on each UNIMUX and it will be upgraded with a binary file.
  - For switch models **with the Transparent USB** ports (i.e. UNIMUX-8HDUT) the file will be named **unimux-suhdt-csx-x.bin (where x-x is the rev number)**.
  - For switch models **without the Transparent USB** ports (i.e. UNIMUX-8HD) the file will be named **unimux-suhd-csx-x.bin (where x-x is the rev number)**.

**Note: Earlier models of UNIMUX that had the extra USB port for specific devices (i.e. UNIMUX-8HDX) will use the firmware version for models without Transparent USB ports.**

2. HID Port Controller – there is one HID Port Controller for each CPU port available on the switch – it will be upgraded with an Intel hex file named **unimux-suhd-cpkmx-x.hex**. Each CPU port is upgraded independently.
3. Vendor Specific Port Controller – there is one such controller for **each** CPU port available on the switch – it will be upgraded with an Intel hex file named **unimux-suhd-cpvdx-x.hex**. Each CPU port is upgraded independently.

The UNIMUX 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 can be made to the User Controller, HID Port Controller, or Vendor Specific Port Controller on an individual basis as needed. Not all CPU ports must be at the same revision level for the UNIMUX to work, but it is highly recommended that if you upgrade one CPU port, you upgrade all CPU ports on a switch.

## Requirements

- CAT5 Patch Cable (supplied with UNIMUX)
- RJ45-DB9 or DB25 Adapter (supplied with UNIMUX)
- 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 UNIMUX on the computer with the Terminal Console.

## Preparation For Upgrade

1. With the power to the UNIMUX OFF, connect the computer to the UNIMUX as shown in the figure below.

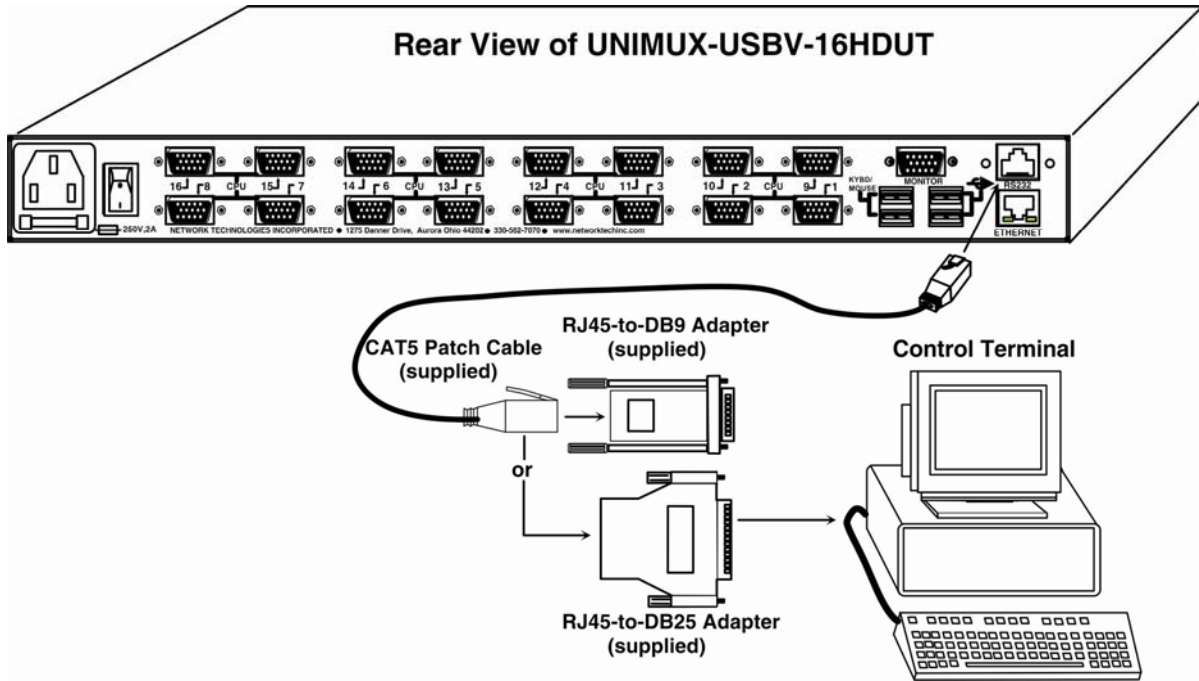


Figure 48- Preparation for firmware upgrade

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 UNIMUX:

Baud rate: 57600

Data bits: 8

Parity: none

Stop bits: 1

Flow control: none

## Upgrade Procedures

### Start the Bootloader

In the HyperTerminal window on the attached computer, press **and hold** the <Tab> key and power ON the UNIMUX. The following message (or one similar) will be displayed on the screen:

```
UNIMUX-HD-NxM Bootloader
Revision: 1.1
Date: 2008/09/11 15:40:16
Copyright (C) Network Technologies Inc.

Press <H> for help..
>
```

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.**

Commands:

-----

```
h, H - Display list of commands
x, X - Exit Bootloader
u, U - Upgrade user controller firmware
p, P - Upgrade HID port controller firmware
v, V - Upgrade vendor specific controller firmware
s, S - Read Checksum of the HID port controller firmware
t, T - Read Checksum of the vendor specific controller firmware
```

## Update the User Controller Firmware

**Note:** *The User Controller Firmware update only needs to be done once, whether the UNIMUX switch is a single-user, or a multi-user model.*

The user controller firmware comes as a file in binary format and has the extension .bin. (i.e. filename.bin). To upgrade the user controller to this file, 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 **unimux-suhd-csx-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>.

## Update the HID Port Controller Firmware

The HID port controller firmware comes as a file in Intel Hex format and has the extension .hex (i.e. filename.hex). To upgrade any of HID controllers (there is one per CPU port) 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 **unimux-suhd-cpkmx-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 the two-digit number of the port to be updated,
<A> to program all or <X> to exit
(the two-digit number should be between 01 and nn,
where nn is the number of available ports):
```

**To program only one device** (CPU port), the corresponding port number must be typed (two-digit number, zero leading, number between 01 and the last CPU port number, depending on switch size). **To program all devices**, just press **<a>**.

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

```
Programming device, please wait...
```

```
Device ID: 0x001E
```

```
Device successfully programmed!
```

The bootloader will then ask again for a port number.

To program another port, type the two-digit number of the port,

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

If **<a>** was pressed instead of a single port number, and all devices were programmed, the message above will be repeated for each port that was programmed. After all are programmed, unless the switch has 32 CPU ports, the following message will be shown on the screen

```
Programming device, please wait...
```

```
Device ID: 0x0000
```

```
Device failed!
```

```
Error Code 1
```

This is shown because the bootloader continues to look for devices until it has found up to 32 (the maximum number of possible CPU ports a single UNIMUX can have). If it doesn't find another port, the procedure will fail and discontinue. On switches with fewer than 32 ports, this is normal.

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

### **Update the Vendor Specific Port Controller Firmware**

Updating the vendor specific port controller firmware is similar to updating the HID port controller firmware (described on page 3). The only differences are that key **<v>** is used to enter this command and the hex file to send will be **unimux-suhd-cpvdx-x.hex**

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



## **Read the Checksum of HID or Vendor Specific Port Controller Firmware**

Reading firmware checksum is useful to determine the version of software running on port controllers. While the firmware revision for user controller can be found on the UNIMUX splash screen when it is powered-ON, the firmware revision of port controllers is not displayed anywhere. Reading checksum is an easy way to identify the current firmware revision in your UNIMUX and to determine if a new firmware revision is available for download.

To read the checksum, type **<s>** for HID port controllers or **<t>** for vendor specific port controllers, at the bootloader prompt. The following message will be displayed:

```
Please, type the two-digit number of the port to be checked,  
<A> to check all or <X> to exit  
(the two-digit number should be between 01 and nn,  
where nn is the number of available ports):
```

To read the checksum for only one device, type the number of the port (two digits, leading 0). To read the checksum for all ports type **<a>**.

The device ID and the checksum will be displayed in the following format:

```
Device ID: 0x001E  
Device Checksum: 0x3AB1
```

The checksums for all revisions of UNIMUX firmware can be found on the NTI download webpage at <http://www.networktechinc.com/download/d-srvsw-usb-hd.html>.

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

## SAFETY STATEMENTS

### Grounding

These products have protective earth ground terminals and are built with full attention to consumer safety. There must be an uninterrupted safety earth ground between the main power source and the product's power cord or supplied power cord set.

If ever the possibility exists for the grounding protection to have been reduced in any way, disconnect the power supply until the grounding connection has been fully restored.

### Servicing

NTI products are not intended to be serviced in the field and contain no user-serviceable parts. In the event repair is needed, all servicing must be performed by factory trained and authorized service personnel. Only those items specifically identified in this manual (if any) may be adjusted by the user of this product and adjusted only as instructed in this manual.

## CABLES

NTI #	DESCRIPTION
HDUSBVEXT-3/6/10/15-MM	Connect each CPU to the UNIMUX-UHD with one
HDUSB-3/6-MM	Connect each CPU to the UNIMUX-UHD with one- NO VIDEO SUPPORT
USBVEXT-3/6/10	VGA and USB extension
USBVEXT-3/6/10/15-MM	VGA and USB interface
USB-AA-5M	Connect up to 5 cables in a series for up to 25 additional meters
USB-A+A-5M	Improved Active USB 5 meter extension
VEXT-3/6/10/15/25/35/50/75/100	VGA extension through 100 feet

Where:

*xx* is the length of the cable in feet

*MM* indicates male-to-male connector

*M* is the length of the cable in meters

**Cables can be purchased from Network Technologies Inc by calling 800-RGB-TECH (800-742-8324) or 330-562-7070.**

## 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.jspx> 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
<b>No mouse or keyboard</b>	<ul style="list-style-type: none"> <li>Cable connections loose</li> </ul>	<ul style="list-style-type: none"> <li>Check all cables for proper connection</li> </ul>
<b>No video</b>	<ul style="list-style-type: none"> <li>Loose video cable</li> <li>Power to monitor OFF</li> </ul>	<ul style="list-style-type: none"> <li>Check video cable connection</li> <li>Make sure monitor is plugged into live outlet and powered ON</li> </ul>
<b>No Keyboard and No Mouse</b>	<ul style="list-style-type: none"> <li>Unit is in Command Mode</li> <li>USB Lockup</li> </ul>	<ul style="list-style-type: none"> <li>Press &lt;Esc&gt; key until Command LED on UNIMUX switch is OFF</li> <li>Hot plug the keyboard/mouse in the device ports on the UNIMUX</li> <li>Hot plug the USB cable from the computer</li> <li>Power cycle the UNIMUX</li> </ul>

## SPECIFICATIONS

Video Connectors	Female 15HD
Video Resolution	1900 x 1200 (max.)
Video Support	SVGA, XGA, VGA, most DVI monitors (when used with NTI DVIF-15HDM adapter)
Video Bandwidth	150 Mhz
USER Keyboard/Mouse connectors	Female USB Type A
Mouse and Keyboard Compatibility	Most USB mice and keyboards
USB Connectors	Female USB Type A
USB Compatibility	USB low and full speed devices
CPU connectors	Female 15HD
CPUs supported	Windows USB, SUN USB, MAC USB
RS232 Connector	Female RJ45
Power required	110 or 220 VAC @ 50-60 Hz
Fuse Protection	2A, 240VAC
Regulatory approval	CE

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## WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at **(800) 742-8324** (800-RGB-TECH) or **(330) 562-7070** or visit our website at <http://www.networktechinc.com> for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.