RACKMUX® Series

RACKMUX-D17HR-N-SUSBHD4
Rackmount KVM Drawer with Built-In Quad Screen Multiviewer and USB KVM Switch Installation Manual

RACKMUX-D17HR-N-SUSBHD4
(Front and Rear View)

TRADEMARK

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CHANGES

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TABLE OF CONTENTS

TABLE OF FIGURES

INTRODUCTION

The RACKMUX® KVM Drawer with Built-In Quad Screen Multiviewer and USB KVM Switch combines a rackmount LCD monitor, keyboard, touchpad mouse, and a Quad Screen Multiviewer with USB KVM switch (SPLITMUX) in a space-saving 1RU industrial strength drawer.

Features Include:
- Available with forward-folding 17.1" Active Matrix LCD DVI flat panel monitor.
- Video Resolution: 1920x1200.
- Integrated HDMI multiviewer and USB KVM switch.
    - Simultaneously display video from four different computers on the KVM drawer's LCD display.
    - Quad, Picture in Picture, Full Screen, and Custom display modes.
- Control up to 4 USB enabled computers with HDMI/DVI outputs.
- Any DVI source or display can be connected by using DVI-HD-xx-MM cable (not included).
    - Use DVIA-HD-CNVTR-LC or DVI-HD-CNVTR DVI + Audio to HDMI Converters to pass and independently switch audio signals to the drawer.
- Torque-friction hinges - monitor does not wobble, spring, or slam shut.
- Compact, heavy-duty tactile keyboard with 17-key numeric keypad.
- Standard 3-button mouse touchpad
    - Touchpad supports single-finger gestures
- Rugged steel construction with durable powder coat finish.
- LCD auto-shutoff in closed position.
- Drawer locks into place when open to prevent it from sliding in and out of the rack.

Materials Included:

- RACKMUX KVM Drawer
- IEC Power cord- country specific
- Single-Person Installation mounting kit
- DB9 Female-to-RJ45 Female adapter
- 5 foot RJ45-to-RJ45 CAT5 patch cable
- URL slip with link to PDF file of this manual
- Cable management tray + 4pc #6-32 x 1/4" flat head black screws
- 6 pcs of 6" cable ties

Material *Not* Supplied, but may need to be ordered

CAT5/5e/6 unshielded twisted-pair cable(s) terminated with RJ45 connectors wired straight thru- pin 1 to pin 1, etc. for Ethernet connection

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*.*
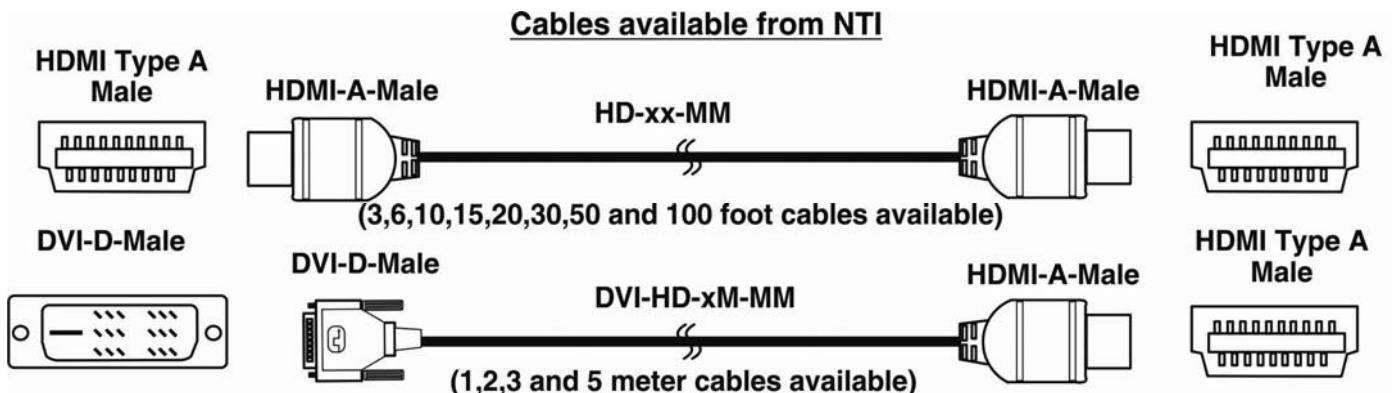
INSTALL CABLE MANAGEMENT TRAY

Your RACKMUX KVM Drawer comes with a cable management tray to provide a means of securing the cables that plug into the rear of the USB KVM Switch.

Install the cable management tray using the 4 #6-32 x 1/4" flat head screws provided.

Use the cable ties (supplied) to secure the cables to the tray.
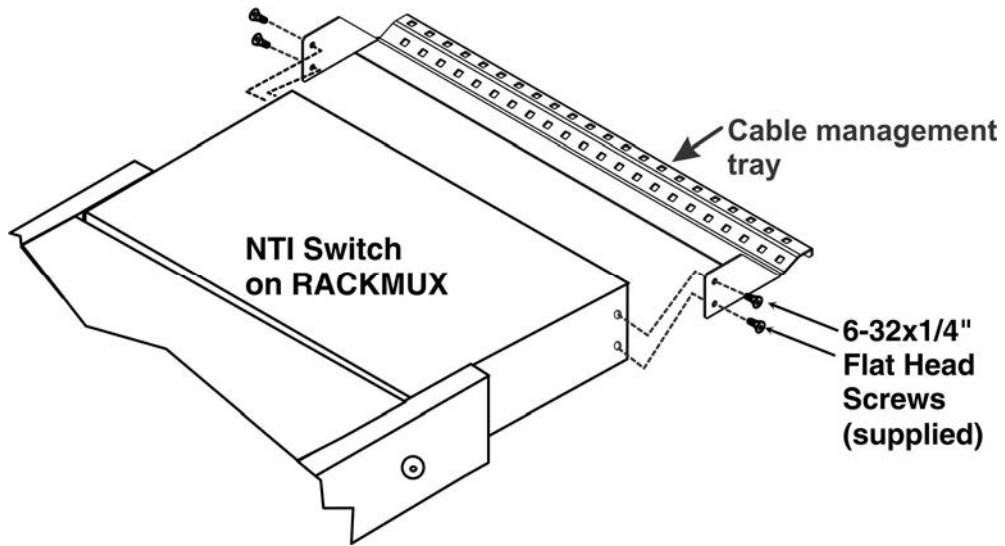
RACKMUX SINGLE-PERSON INSTALLATION

Your NTI RACKMUX Drawer was designed for easy installation by one person with a minimum of tools and effort.   Follow the simple steps below to quickly install your RACKMUX Drawer.

If you would like to see a video of this installation, see the "single-person-installation" video .

1. Locate and unpack the hardware bag.   Your hardware bag will include all items necessary to install the specific RACKMUX model (see the manual that accompanied your RACKMUX drawer), including the following hardware unique to the Single-Person hardware installation:

- 10- #10-32 cage nut
- 2- #10-32 x 1/2" flat-head machine screw
- 8- #10-32 x 3/4" pan-head machine screw

To install the rails you will need only a tape measure and Phillips screwdriver.

2. Unpack the left and right rail assemblies. Each are labeled "Right Front" and "Left Front" to indicate their intended position and orientation.   Extend each rail assembly to the dimension required for your rack.   Rail assemblies are adjustable to fit within a rack between 24" and 40" in depth.
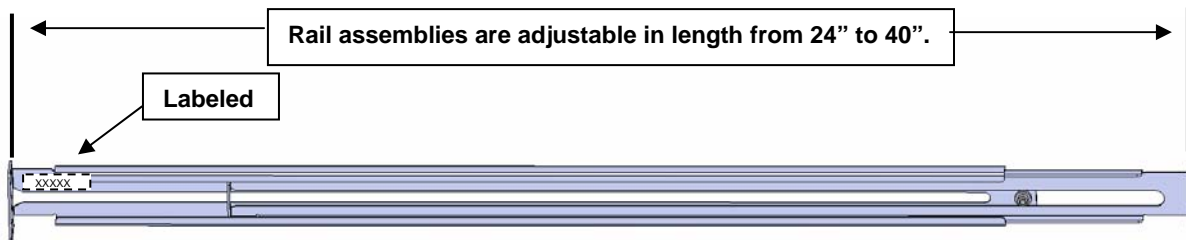
Figure 1- Adjustable rail assemblies

3. Install six #10-32 cage nuts at the front of the rack in positions where the RACKMUX will be mounted (three in each side). Install four more cage nuts at the rear of the rack in positions straight across from the upper and lower cage nuts installed in front.

Extender Rail

Cage Nuts

Rear Rack Support

Extender Rail

Cage Nuts

Front Rack Support
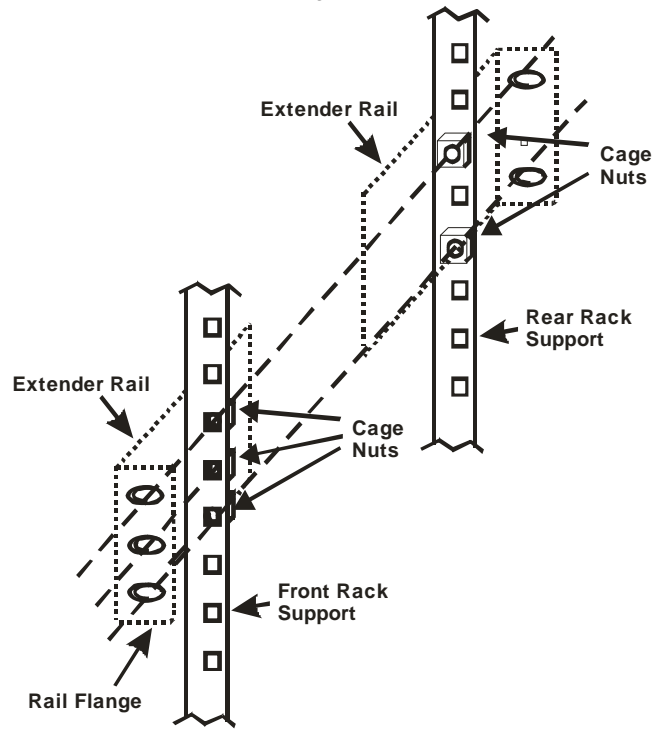
Rail Flange

Figure 2- Install the cage nuts

4. Install the right rail assembly.   The end with the label "Right Front" mounts to the front rack support. Install only the center screw through the rail flange to the rack support and cage nut using the #10-32 x 1/2" flat head machine screw provided. (See image below.)   Do not tighten at this time.   Install the left rail assembly in the same fashion.   The end with the label "Left Front" mounts to the front rack support.

5. Install two #10-32 x 3/4" pan-head screws in the rear of each rail assembly as shown below.   Do not tighten at the time.

Install two screws in each side at the rear

Install one flat head screw in the center in each side at the front

Rack Front

Rack Rear
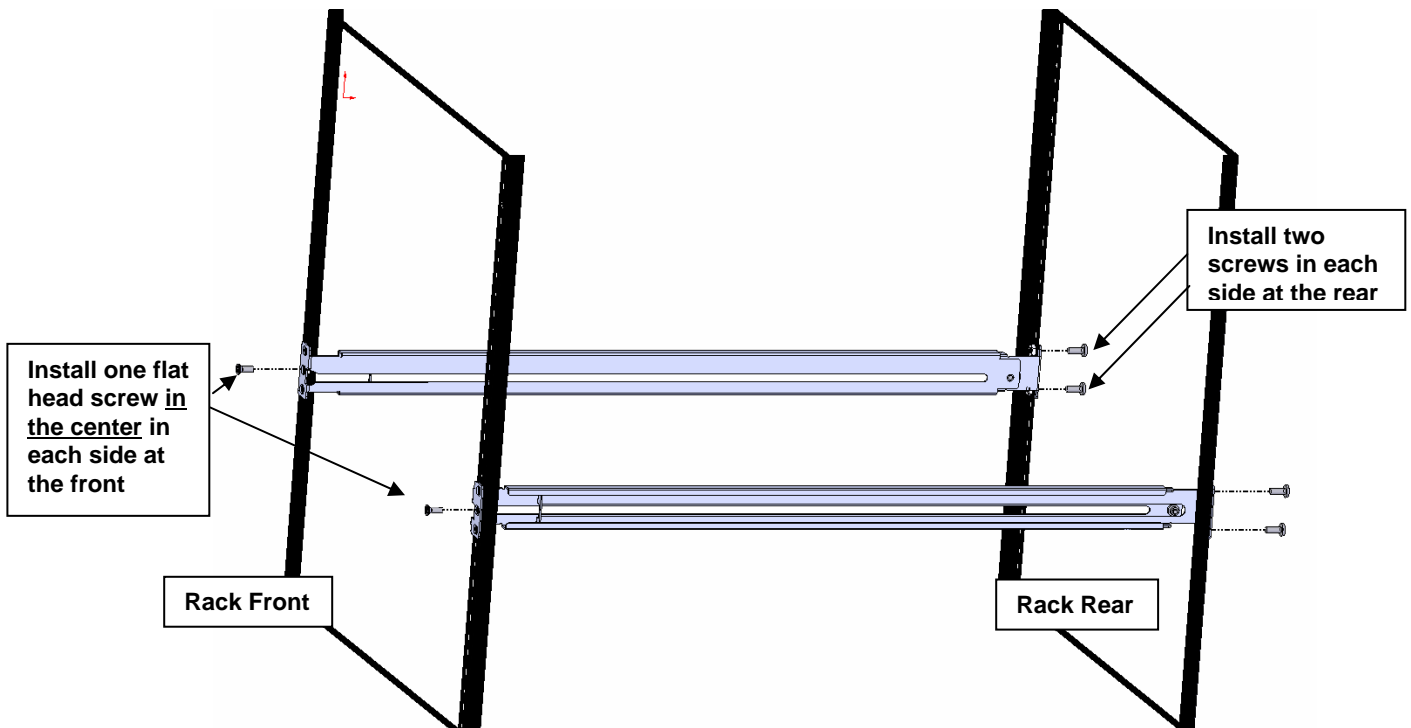
Figure 3- Install the rail assemblies

6. Measure the distance between the inside of the rails at the front of the rack.   Adjust the distance to 17-1/4" and tighten the flat-head screws to the rail flanges securely.

Left Rail

Right Rail

17-1/4"

Front Rack Supports
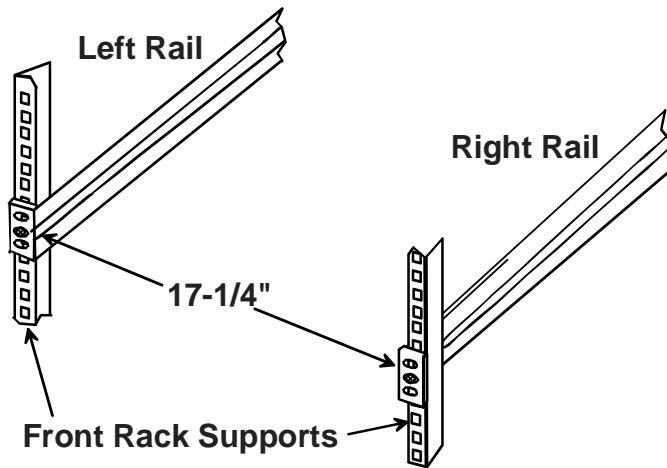
Figure 4- Check spacing of the rails

7. Lineup the rail guides on the RACKMUX drawer with the slots in the front of the left and right rails and slide the drawer into the rack.   The rail guides should be positioned such that the wide lip of the guide is on the backside of the rail. Slide the drawer in completely.

Rail guides

Wide lip of rail guide
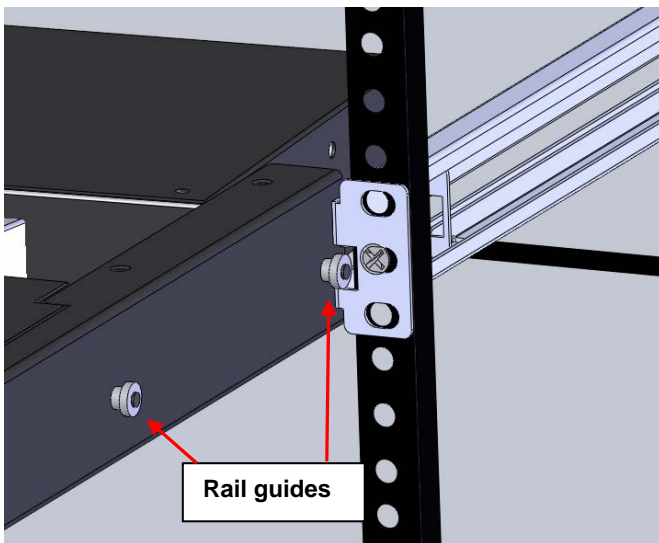
View of rail guide from the front of the rack support   **View of rail guide from the backside of the rail**
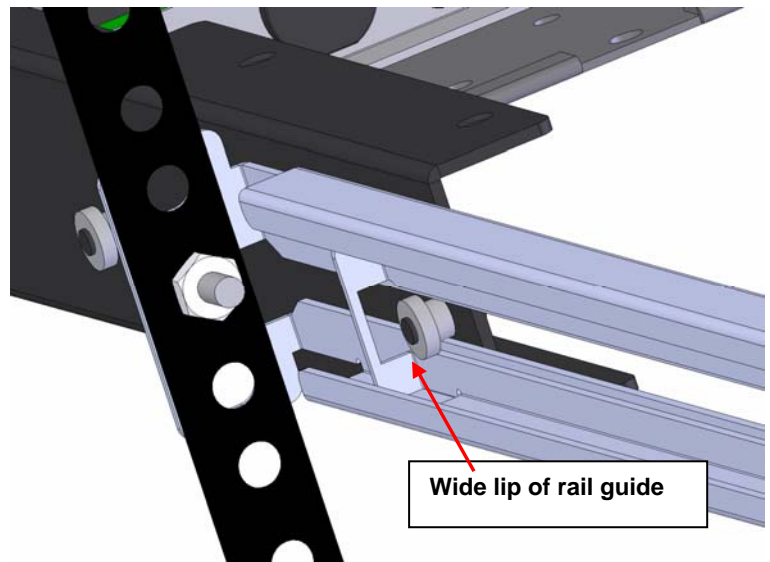
Figure 5- Rail guides

8. Apply four more #10-32 x 3/4" pan-head machine screws (two for each) through the holes in the drawer flanges, through the holes in the left and right rails, into the cage nuts in the rack supports.   Tighten each securely.

Apply two more screws on each side

There should be a total of <u>six screws</u> at the front now.
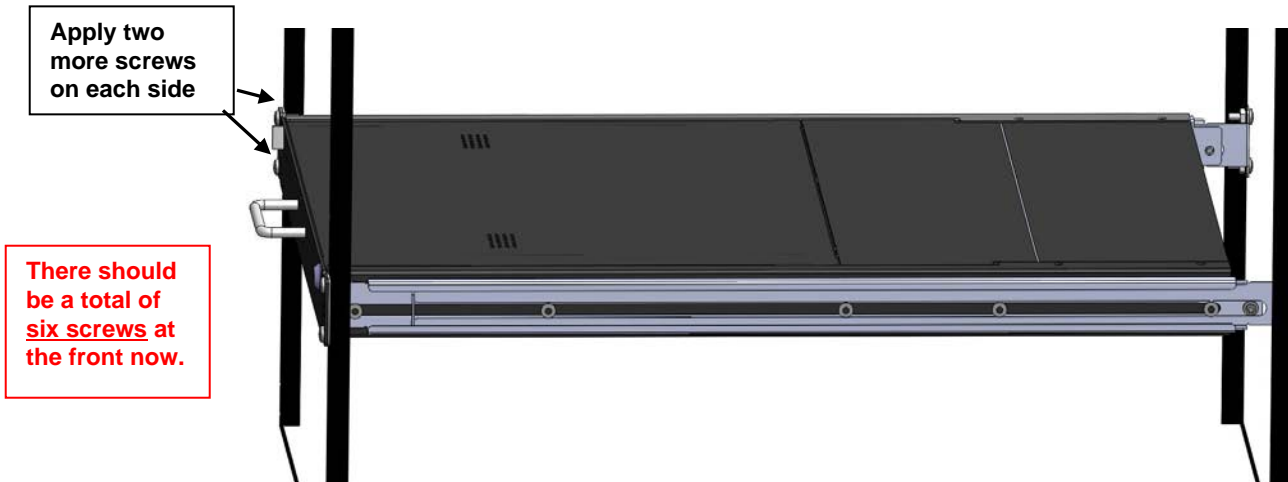
Figure 6- Apply remaining screws to complete installation

9. Tighten securely the four screws applied to the rear rail flanges in step 4.

10. Make your cable connections according to your RACKMUX Drawer instructions.

Your NTI RACKMUX Drawer is now installed and ready for cable connections.

CABLE CONNECTIONS

Connect Video Sources

1. Connect each of the HDMI or DVI video sources to the ports on the multiviewer (SPLITMUX) marked "HDMI Inx" (x = 1-4).
2. Connect the power cord to the AC input and plug it in.
3. Press the switch to power the RACKMUX ON.   In approximately 40 seconds the SPLITMUX will boot up and be ready to use.
4. The RACKMUX keyboard provides keyboard control of the OSD menu of the SPLITMUX. The RACKMUX supports transparent USB device connection such that the keyboard and touchpad mouse will also control the keyboard and mouse functions on any connected PC.
5. For each video source that is a PC, connect a USB2-AB-0-5M-5T cable (sold separately) between a USB type A female user device port on a CPU and a USB Type B female port on the SPLITMUX.
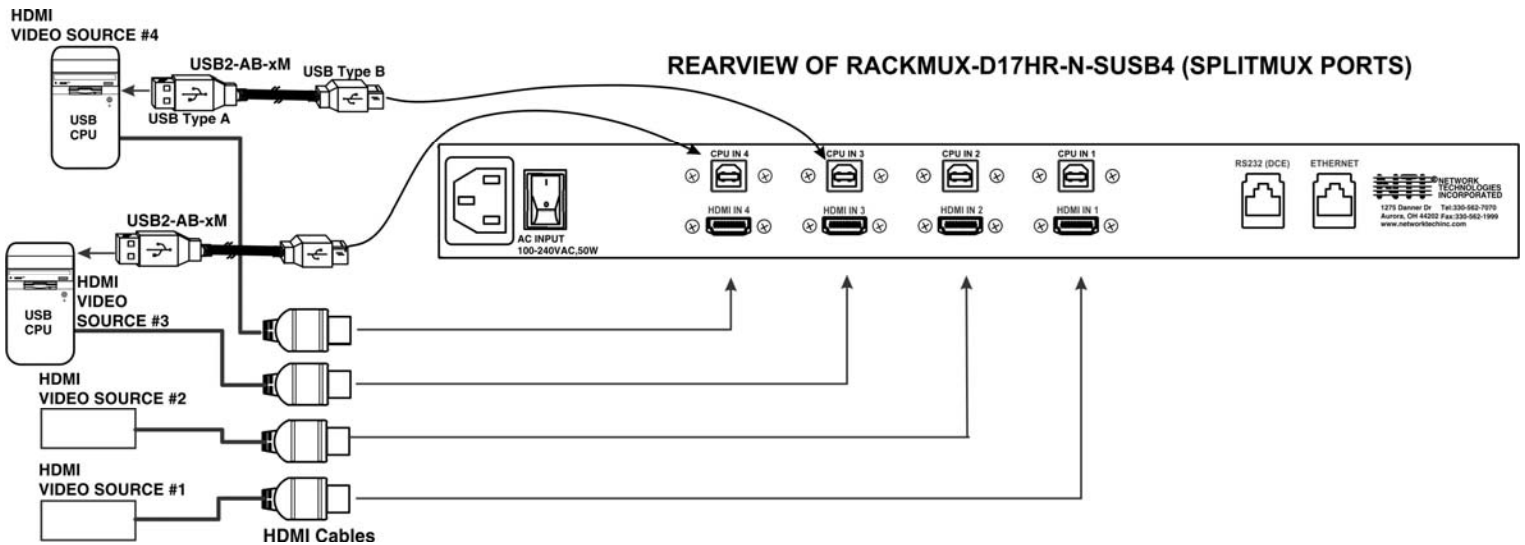
Figure 7- Connect each CPU and video source

6. Power-ON the video sources and CPUs.

- 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 RACKMUX.

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

7. Power-ON the RACKMUX. (The RACKMUX can be powered at any time.)

Terminal Connection for RS232

If control via serial connection is going to be used, serial control can be achieved by connecting a control terminal to the "RS232" port .

<u>To use the "RS232" port</u>, connect one end of a CAT5 patch cable (supplied) to the port labeled "RS232" on the rear of the SPLITMUX. Plug the other end of the CAT5 cable into an RJ45-to-DB9F adapter (supplied), and connect the adapter to the RS232 port on the control terminal.
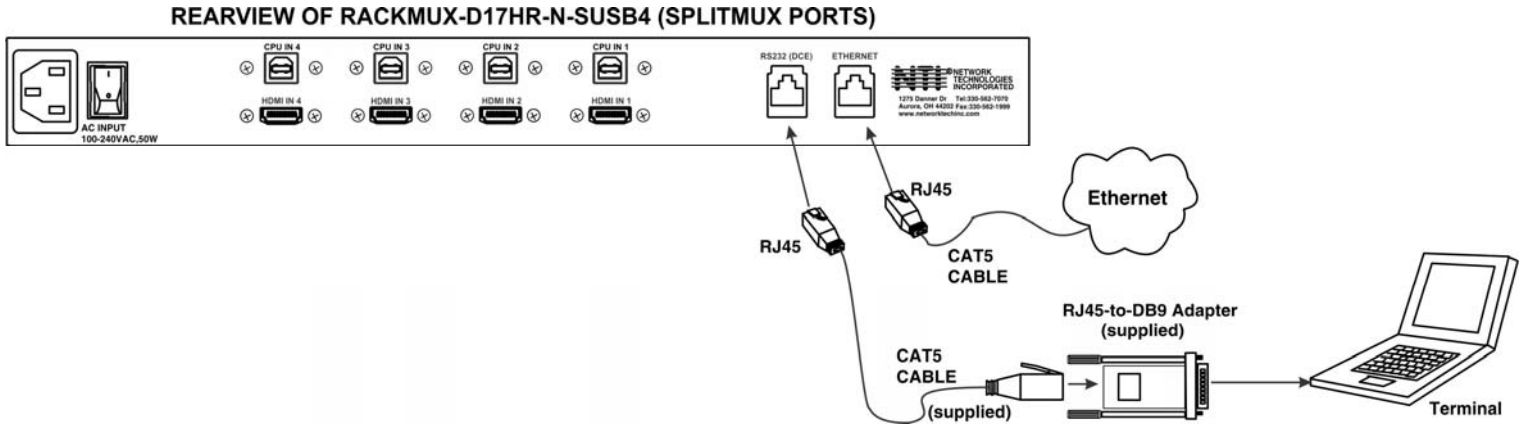
Figure 8- Ethernet and RS232 Terminal Connection

Ethernet Connection for Remote User Control

To make a remote connection, over the Ethernet, from anywhere on the local area network, connect a CAT5/5e/6 Ethernet cable with RJ45 male connectors on the ends, wired straight through (pin 1 to pin 1, pin 2 to pin 2, etc.).   Up to 8 users can connect to the SPLITMUX using the Ethernet at a time.

Note: Alternatively, a direct connection from a computer's Ethernet port to the SPLITMUX "ETHERNET" port may also be made using the same cable.

Connect Extra Device

On the front of the RACKMUX is an additional USB Type A port to be used, if desired, for an extra accessory.   Any low or full speed USB device may be connected to this port to be used.   This port is fully compliant with USB standard 1.1.

Note: In order for the optional USB device port to be usable, the USB port on the rear of the RACKMUX must be connected to a USB enabled CPU (a 2 meter USB cable is supplied).

Note: If a USB keyboard or mouse is connected,   operation of the RACKMUX keyboard or mouse may cause unpredictable results.   Do not try to use both mice or both keyboards at the same time.

Figure 9- Connect a USB 1.1 device to the front (optional)

FEATURES AND FUNCTIONS

Front View
RACKMUX-D17HR-N

REARVIEW OF RACKMUX-D17HR-N-SUSB4 (SPLITMUX PORTS)

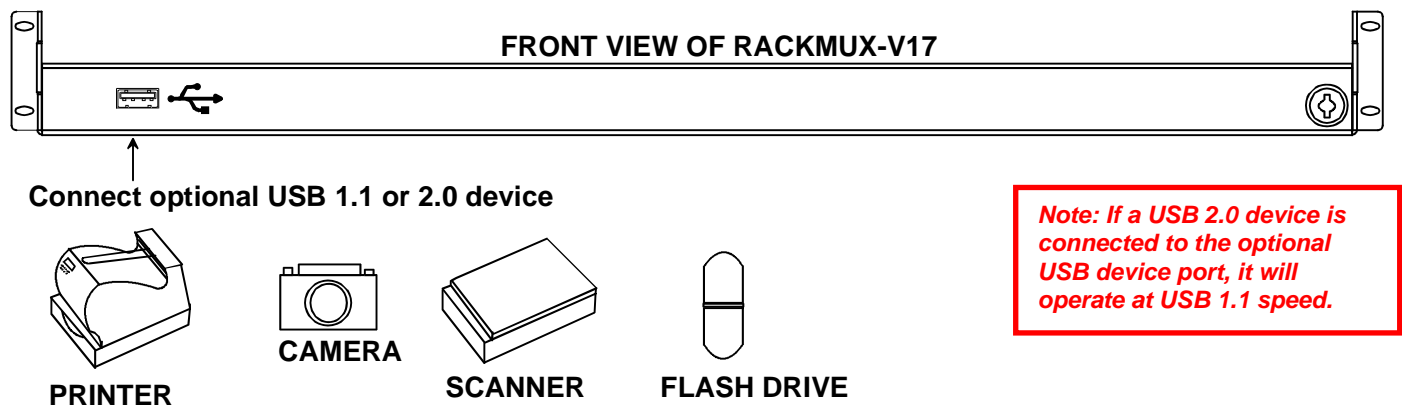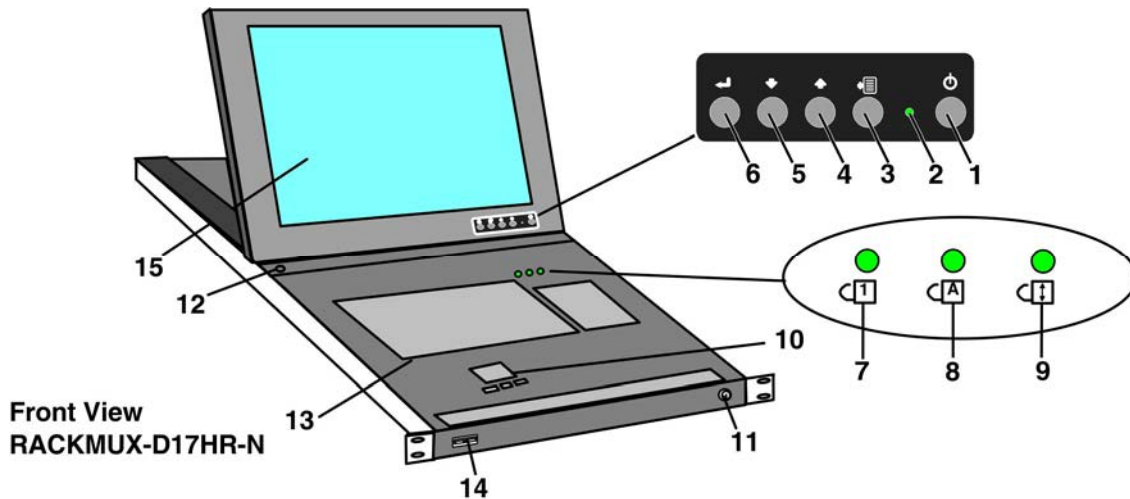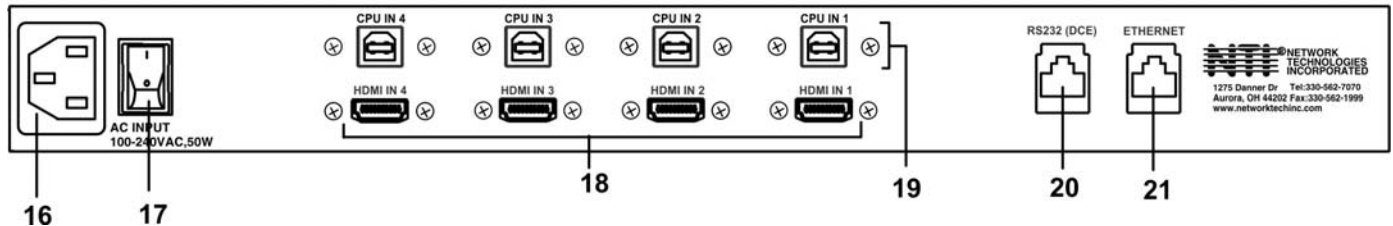| #	LABEL	PHYSICAL	DESCRIPTION
1	Power	Button	press to turn only the LCD monitor ON and OFF
2	---	Green/Red LED	Indicates operation status Green = Power-ON, Video Input Signal OK Red = Suspend / Stand-by, or no Video Input Signal
3	Menu	Button	press to turn ON the OSD menu
4	Up Arrow	Button	press to move the cursor in the OSD menu up
5	Down Arrow	Button	press to move the cursor in the OSD menu down
6	Select	Button	press to select a menu item (when OSD menu is ON)
7	NumLock	Green LED	illuminates when the number lock is ON
8	CapsLock	Green LED	illuminates when CapsLock is ON
9	Scroll Lock	Green LED	illuminates when the Scroll Lock keyboard feature is ON.
10	---	3-button mouse	for controlling mouse movements on the monitor and controlling the computer
11	---	Keylock	to prevent unauthorized use of the RACKMUX
12	---	Auto Shut-OFF	switch automatically shuts OFF the LCD display when the monitor is folded down
13	---	Keyboard	for manual data entry and computer control
14	---	USB Type A	for connection of USB 2.0 device (flash drive, printer, CAC reader, etc)
15	---	LCD Display	for viewing the video signal from the connected CPU
16	---	IEC Connector	for attachment of the IEC power cord to power the RACKMUX drawer
17	---	Main Switch	for powering ON and OFF the RACKMUX drawer
18	HDMI Inx	HDMI female	for connecting video sources
19	CPU IN*x*	USB Type B female	for connection of video cables from video sources supplying Hi-Definition video- to provide control over the sources
20	RS232	RJ45 female	for attaching RS232 interface cable from a CPU to control the functions of one or more switches
21	ETHERNET	RJ45 female	for connection to an Ethernet for remote user control

CONTROL METHODS

The SPLITMUX, when built into a RACKMUX, can be controlled using any of four methods;

- Command Mode using the local keyboard, and touchpad mouse
- Using the Command Line Interface either through RS232 or remote connection
- Using a Text Menu either through RS232 or remote connection
- Remotely through the Web Interface using an Ethernet connection.

Command Mode

The attached keyboard and mouse will, by default, control the PC supplying the active video.   The keyboard and mouse can also be used for controlling Standard Mode functions as well as OSD Mode (see OSD menus on page 57 of the SPLITMUX-USBHD-4RT Quad Screen Video Splitter manual.).

To control the SPLITMUX using the keyboard, press **<Ctrl> + <`>** (accent/tilde key) on the keyboard (press at the same time) to enter Command Mode.   While in Command Mode, all 3 status lights on the keyboard will illuminate to indicate that Command Mode is enabled.

When entering Command Mode, the Standard Mode functions will be controlled as follows:

Keypress	Function
1 thru 4	Select Channels 1 thru 4
F	switch to Full screen mode
Q	switch to Quad mode
P	switch to PIP mode
C	switch to Custom mode
O (Letter "O")	Toggle OSD Menu (Open/ Close)

OSD Menu Navigation:

Down Arrow or Tab	Move down thru OSD menu selections
Enter	Select the Menu item
Left/Right Arrow	Change values of menu item
L / R / U / D	Move the OSD screen on the display

Press <**Esc**> to exit Command Mode.

To control the SPLITMUX using the touchpad mouse, move your finger on the pad from side-to-side rapidly.   This motion will place the SPLITMUX in Command Mode.   While in Command Mode, all 3 status lights on the keyboard will illuminate to indicate that Command Mode is enabled.   The keyboard functions described on page 14 will be active while in Command Mode.
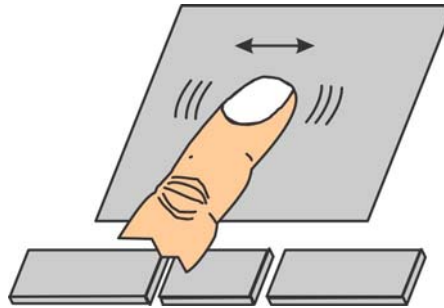
Figure 10- Shake mouse to enter Command Mode

While in Command Mode, Right-click the mouse to open the OSD menu.   To exit the OSD menu, Right-click the mouse once more.

To exit Command Mode after closing the OSD menu, either Left-click the mouse or press <**Esc**> on the keyboard.

For more on using the touchpad (mouse) to control the OSD menu, see page 57 of the SPLITMUX-USBHD-4RT Quad Screen Video Splitter manual.
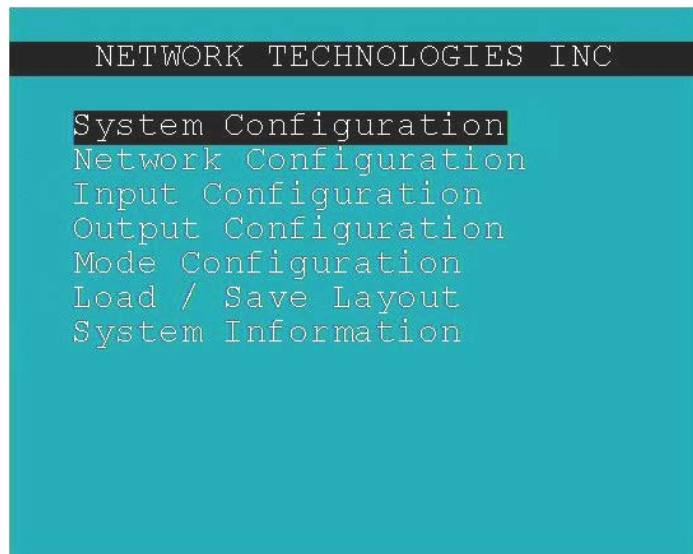
Figure 11- OSD Menu for the SPLITMUX

In FULL screen mode, only the active video source will be displayed.   The image will be viewed at full size and maximum resolution.

In QUAD screen mode, all four video sources share the screen
 equally.   Each video source is displayed completely.

In PIP mode (right) , either 2, 3 or all 4 video sources can be displayed, with the active source being displayed in its entirety on the full screen and the remaining selected images at a reduced resolution for simultaneous viewing. The position of the reduced images can be configured for preferred viewing.

In CUSTOM mode (below) the 4 video sources can be placed where ever you want, at what ever size you want. The amount of each source that is viewed is determined by your configuration.

Much more information on the use of the SPLITMUX features can be found at http://www.networktechinc.com/hdmi-multiviewer.html#tab-6 in **man225.pdf** entitled "SPLITMUX-USBHD-4RT Quad Screen Video Splitter Installation and Operation Manual"

DISPLAY FUNCTIONS

An NTI RACKMUX with a 17" monitor supports resolutions up to 1920 x 1200 with a refresh rate at between 55 and 76Hz. The quality of the image on the LCD monitor is adjustable using an On Screen Display (OSD) menu using the control buttons on the RACKMUX.

Standard Controls

The RACKMUX has 5 standard control buttons and a power LED. The 5 standard control buttons operate as follows:

- The **Power** button turns the RACKMUX LCD Monitor and backlight ON and OFF as desired.

- The **Power LED** located immediately to the left of the Power button is a dual color LED. It will illuminate with a green color when the RACKMUX is powered ON and has video sync. It will illuminate with a red color if the RACKMUX is powered ON but there is no input signal detected.

- The **Menu/Select** button is used to bring up the OSD menu where the various settings of the LCD display can be adjusted. Once the OSD screen is displayed, the Menu/Select button is used to make selections within the menus.   See "OSD Control Menu" (below) for more on LCD display settings.

- The **Up and Down Arrow** buttons are used to navigate through the menus.   Move the cursor up or down as desired to highlight an item for selection.   Once an item is highlighted, pressing the Menu button will select it.

- The **Exit/Auto Adjust** button will exit the OSD menu when visible.   When the OSD menu is OFF, the button will act as an **Auto Adjust** button to keep the user from having to use the menus to adjust the quality of the image on the monitor.

OSD Control Menu- 17 Inch Hi-Resolution Model (-HR)

The OSD (On Screen Display) Menu enables the user to select the desired characteristics of the LCD display.   To activate the OSD Menu,   press the **Menu** button (below).   To turn the Menu back OFF, either press the Exit button or just wait approximately 10 seconds (timing is adjustable) and it will automatically be cleared from the screen.   Any changes made before exiting the menu will be saved.
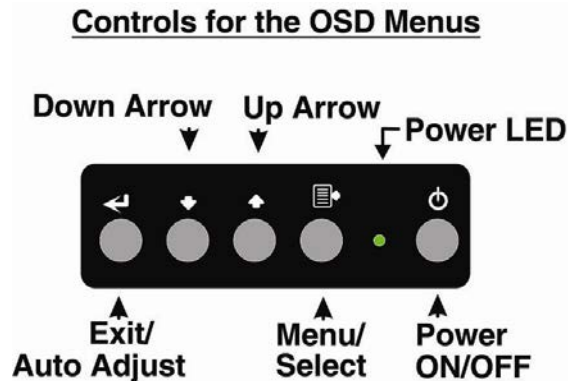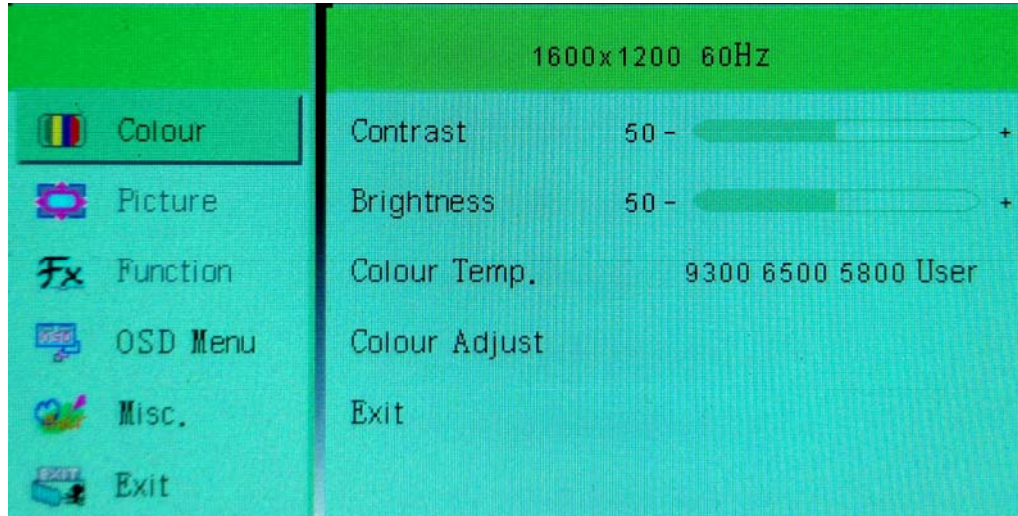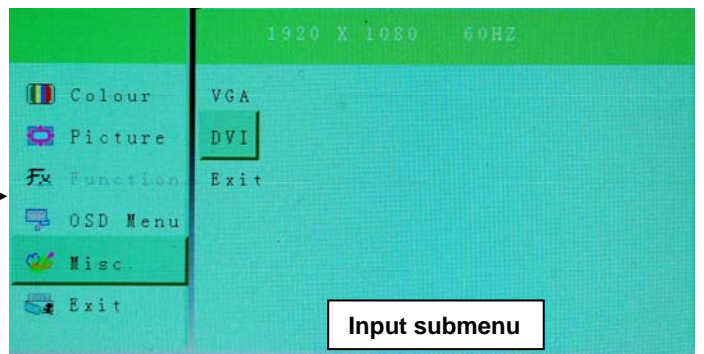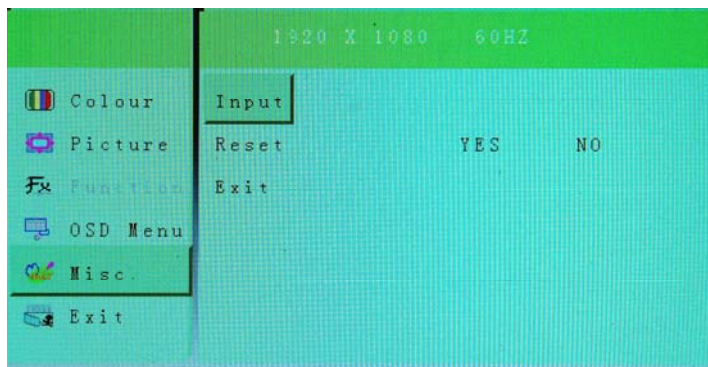

Figure 12- OSD Controls
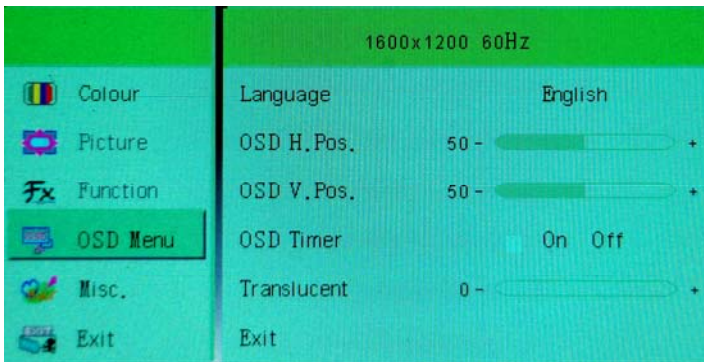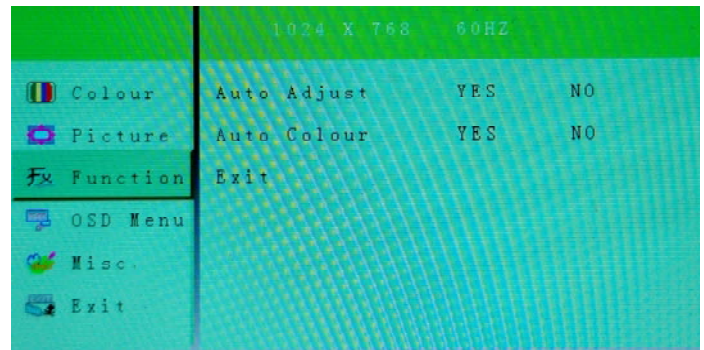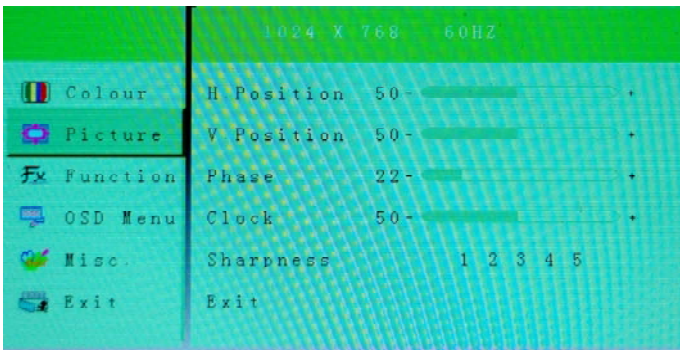
OSD Main Menu

The Main Menu is broken into five sections,   Color, Picture, Function, OSD Menu, and Misc. Press one of the arrow buttons to move between them.   The Picture and Function sections only apply when the RACKMUX is connected as VGA instead of DVI. To select a menu and move to characteristics within them (i.e. CSM, Brightness, or Contrast under the Picture menu), press the **Select** button while the desired menu is displayed.

Characteristics that can be adjusted are described in the chart below.

Selection	Purpose	Range

Colour
   Contrast
   Brightness
   Colour Temp.
   Colour Adjust
	• Increase/decrease panel contrast level
	• Increase/decrease panel brightness level
	• Set panel color temperature
	• Select RGB balance (goes to submenu)
		• 0-100
		• 0-100
		• 5800K,9300K,6500K,User
		• 0-100

Picture (VGA Only)
   H Position
   V Position
   Phase
   Clock
   Sharpness
	• Control Horizontal position of screen
	• Control Vertical position of screen
		• 0-100
		• 0-100
		• 0-100
		• 0-100
		• 1-5

Function (Fx) **(VGA Only)**	To manually force auto adjust of monitor settings	Select Auto Adjust or Auto Color functions

OSD Menu
   Language
   OSD H. Pos.
   OSD V. Pos.
   OSD Timer
   Translucent
	• Select the language of the OSD menu
	• Control Horizontal OSD Image position on screen
	• Control Vertical OSD Image position on screen
	• Control if OSD will time out
	• Adjusts how boldly the menu is displayed
		• English, Spanish, German, Italian, or French
		• 0-100
		• 0-100
		• On/Off If On, select 3-100 seconds.
		• -/+

Misc.	• Select Input • Reset monitor to default settings	• VGA or DVI • Yes/No

Press the **Exit** button or select "Exit" to exit the OSD menu.

1920 X 1080   60HZ

- Colour — Contrast   50
- Picture — Brightness   50-
- Function — Colour Temp   9300   6500   User
- OSD Menu — Colour Adjust
- Misc. — Exit
- Exit

→

1920 X 1080   60HZ

- Colour — Red   100-
- Picture — Green   100-
- Function — Blue   100-
- OSD Menu — Exit
- Misc.
- Exit

Colour Adjust submenu

1024 X 768   60HZ

- Colour — H Position   50-
- Picture — V Position   50-
- Function — Phase   22-
- OSD Menu — Clock   50-
- Misc. — Sharpness   1 2 3 4 5
- Exit — Exit

1024 X 768   60HZ

- Colour — Auto Adjust   YES   NO
- Picture — Auto Colour   YES   NO
- Function — Exit
- OSD Menu
- Misc.
- Exit

1600x1200 60Hz

- Colour — Language   English
- Picture — OSD H.Pos.   50 -
- Function — OSD V.Pos.   50 -
- OSD Menu — OSD Timer   On Off
- Misc. — Translucent   0 -
- Exit — Exit

1920 X 1080   60HZ

- Colour — Input
- Picture — Reset   YES   NO
- Function — Exit
- OSD Menu
- Misc.
- Exit

→

1920 X 1080   60HZ

- Colour — VGA
- Picture — DVI
- Function — Exit
- OSD Menu
- Misc.
- Exit

Input submenu

KEYBOARD FUNCTIONS

Numeric Keypad

This RACKMUX has a standard Windows keyboard with 17-key numeric keypad.
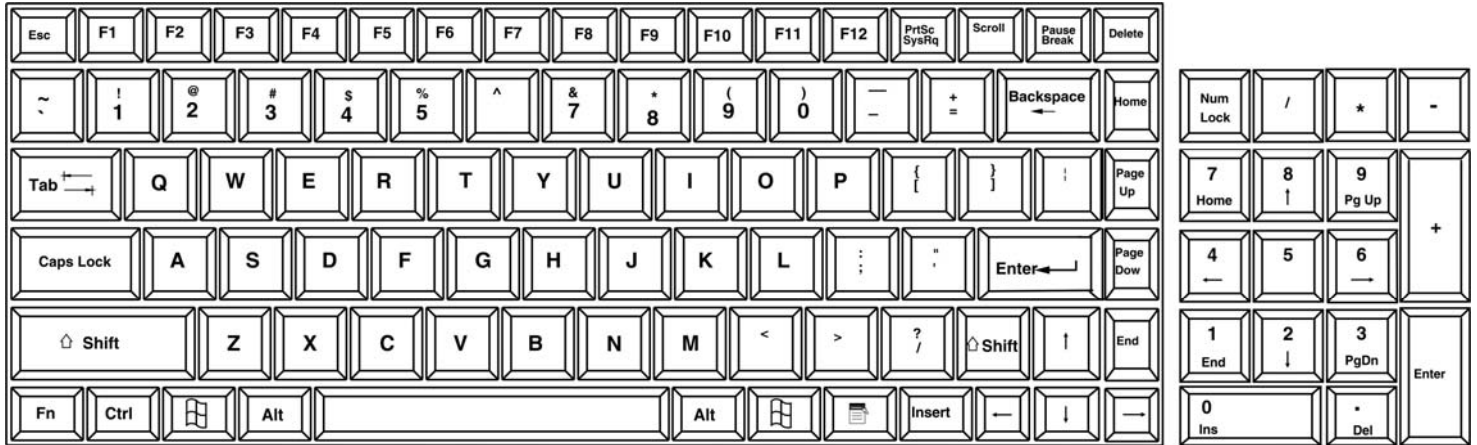

Figure 13- U.S. (English) keyboard with numeric keypad

SAFETY

This NTI product has been designed and fully tested with user safety of the utmost importance.   As with all electronic devices, this NTI product should be handled and operated with care. In order to avoid possible injury and to reduce any risk of damage to this product, please read and follow each of these safety instructions.

- Follow all instructions found in this manual

- Follow all instructions found on the product

- Do not attempt to perform any service on this product unless specifically instructed to in this manual

- Do not remove covers or disassemble

- Objects that can damage or be spilled on this product should be kept away from this product.   Liquids, if spilled, could come into contact with voltage points causing a risk of fire or electrical shock.

- Always unplug this product before cleaning it

- Do not use any liquid or aerosol cleaners to clean this product

- Do not install or use this product near water

- Be sure to mount this product on a solid, stable surface or in a rack (if applicable)

- Route all cables and the power cord away from sharp edges or objects that could cause damage to them

- Use only the power cord or AC adapter that came with this unit or one that meets the requirements specified in this manual

- Use only a properly grounded 3-wire electrical outlet for power connection

- Unplug this product and contact NTI should any of the following conditions occur:

  - The power cord or connection cables have been damaged

  - The product has come into contact with any liquids

  - The product does not operate properly despite having followed all of the instructions

  - The product has been dropped or the case has been damaged in any way

  - The product performs distinctly different than it did when first put into service

RACKMUX-KVM DRAWER STANDARD SPECIFICATIONS

General Specs

Case Material	Electro-galvanized steel black powder coated
Dimensions WxDxH (in.)	19 x **27.5** x 1.75 (add 1.5" for the handle and 3" for the cable tray when installed)
Supported Rack Depths	Adjustable rails 24" – 40"
Weight	26 lbs.
Input Power	AC 100-240V, 50 – 60 Hz
Operating Temperature	0-40˚C
Storage Temperature	-20-60˚C
Relative Humidity	20-90%, non-condensing
Approvals	All parts comply with RoHS

LCD – 17" Hi-Resolution

Display area	379.3mm (W) x 244.6 (H) (17.1 inch diagonal)
Panel Type	TFT Active
Number of Pixels	1920 (H) x 1200 (V)
Color Depth	6 bit,262,144 colors
Pixel Pitch	0.191(H) x 0.191(V)
Brightness	275cd/m2
Operating Lamp Life	10,000 hrs

Display Controller: DVI

Connector	DVI-D, female
Video Format	VGA,SVGA, XGA, SXGA
Signal Input (from Video Source)	Digital TMDS
Sync Range	H: 31 ~ 80KHz, V: 55 ~ 76Hz
OSD Control	Menu, Up, Down, Select, Power (5 keys)
Plug and Play	VESA DDC 2B Ver1.3

OSD Control Board

OSD Control	5 Keys
Power Key	Power ON/OFF
Menu Key	Activates Menu
Up, Down Keys	Navigation Control
Select Key	Select (when in Menu); Auto Adjust (not in menu)
LED	Indicates Operation Status
	Green = Power-ON, Video Input OK
	Red = Suspend / Stand-by, or Input Out of Range

Keyboard

No. Of Keys	104 Keys (US)
Key Switch Type	Membrane switch
Keytop Style	Rectangular Cylindrical
Operating Force	50gf +/- 25gf
Stroke	3.0mm +/- .5mm
Tactile	20 gf typ.
Height	8.5 mm
Operating Life	10M operations, minimum
Interface	Row and column matrix
Key Switch Bounce	10 ms, maximum
Supported Platforms	USB
CPU Connectors	USB Type B (USB);

Touchpad

Motion Detection Method ....capacitance sensing
X/Y Position Sensing Resolution ....40 counts/mm
X/Y Position Reporting...................................Relative (Similar to mouse)
Tracking Speed...Up to 1016 mm/sec
Touch Force..No Contact pressure required
Lifetime (Plastic Overlay) ....Minimum 10,000,000 strokes
Sample Rate ....Up to 100 samples/sec
Gesture support...Single-finger gestures supported

TROUBLESHOOTING FOR KVM DRAWER

Each and every piece of every product produced by Network Technologies Inc is 100% tested to exacting specifications.   We make every effort to insure trouble-free installation and operation of our products. If problems are experienced while installing this product, please look over the troubleshooting chart below to see if perhaps we can answer any questions that arise If the answer is not found in the chart, a solution may be found in the knowledgebase on our website at http://information.networktechinc.com/jive/kbindex.jspa or please call us directly at (**800) 742-8324 (800-RGB-TECH)** or **(330) 562-7070** and we will be happy to assist in any way we can.

Problem/Message	Cause	Solution
"OUT OF FREQUENCY"	Input signal is outside the supported range	Lower or raise video frequency to be within specified range
"POWER SAVER MODE"	The input signal is not present. This message will disappear after 5 seconds.	Check all cable connections- verify that they are secure and that video is available
"NO SIGNAL"	The input signal is not present immediately after power ON.	Check all cable connections- verify that they are secure
"AUTO CONFIGURATION"	The LCD monitor is configuring itself for proper communication with the CPU.	No action necessary
Keyboard/touchpad not functioning	• Keyboard is in the incorrect mode • Cables are not properly connected	• Toggle the keyboard mode from PS/2 to USB. (Press <**Ctrl**> + <**T**> keys for 8 seconds) • Check all cable connections between the RACKMUX and the computer.
LCD is not displaying image	• Image out of range • LCD Auto-Shut OFF button is depressed • LCD is powered OFF	• Lower the resolution • Make sure nothing is resting on the button • Turn power to LCD ON

INDEX

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.

MAN264   Rev.3/22/2022