

# **HDMI 4x4 Matrix Switch**

## **500415**



## **Installation Guide**

P/N: 94-000671-A SE-000671-A

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**MuxLab**

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This product uses an unmodified version of FreeRTOS V6.0.0.

Source code available at [www.freertos.com](http://www.freertos.com)

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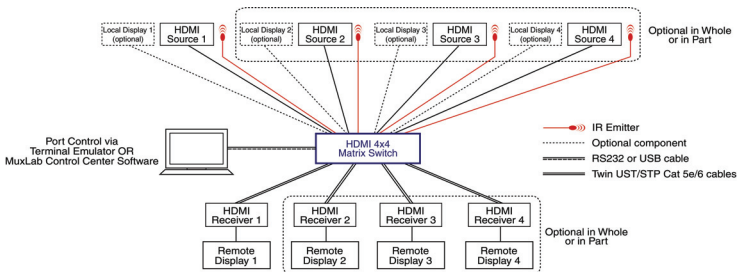
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# 1. Overview

## 1.1. Description

The MuxLab 500415 HDMI 4x4 Matrix Switch allows four (4) HDMI sources to be switched/distributed up to four (4) local displays and up to four (4) remote displays via unshielded twisted pair (UTP) or shielded twisted pair (STP) cables for cost-efficient connectivity. Remote HDMI equipment can be connected up to 150 feet (46 meters) @ 1080p Deep Color via two (2) Cat 6 UTP cables. The HDMI 4x4 Matrix Switch works in conjunction with MuxLab's HDMI Receivers (500407 or 500417).



Applications include commercial and residential AV systems, classroom projector systems, digital signage, boardroom systems, multi-room systems, classroom training, retail systems, collaborative PC systems, and medical information systems.

## **1.2. Features**

- UTP/STP modular RJ45 jacks on four (4) outputs.
- HDMI input and HDMI local output.
- IR support for remote control of all four (4) HDMI sources.
- Support for 1080p Deep Color up to 150 ft (46 m) via Cat 6 UTP cables.
- Seamless integration with MuxLab's HDMI Receivers (500407 or 500417).

# 2. Technical Specifications

<b>Environment</b>	HDMI 1.3A		
<b>Devices</b>	LCD and Plasma TVs, DVD and Blu-Ray players, monitors, projectors, PCs, laptops, home theatre systems, home theater PCs, game consoles, servers that support HDMI.		
<b>Transmission</b>	Transparent to the user		
<b>Bandwidth</b>	Video: 225 MHz		
<b>Signals</b>	HDMI 1.3a protocol		
<b>Connectors</b> <i>HDMI Cables not included.</i>	Source Input:	Four (4) HDMI receptacles	
	Local Output:	Four (4) HDMI receptacles	
	Distributed Output:	Four (4) UTP/STP outputs via eight (8) RJ45S connectors for Cat 5e/6 UTP/STP cabling	
<b>Maximum Distance</b> <b>HDMI Switch to Display</b> <i>Based upon a maximum length of 6.6 ft (2 m) of HDMI cable per end.</i>		<b>Cat 5e</b>	<b>Cat 6</b>
	<b>480i/p</b>	300 ft (91 m)	300 ft (91 m)
	<b>720p, 1080i</b>	300 ft (91 m)	300 ft (91 m)
	<b>1080p</b>	150 ft (46 m)	200 ft (61 m)
	<b>1080p Deep Color</b>	90 ft (27 m)	150 ft (46 m)
	<i>NOTE: STP cables must be used in an electrically noisy environment. Also, cross-connection reduces the effective distance depending on the grade of twisted cable used.</i>		
<b>RJ45 Pin Configuration</b>  <i>Reverse Polarity Sensitive</i>  <i>Use EIA/TIA 568A or 568B straight-through wiring</i>	<b>RJ45 A (HDMI A)</b> Pin 1 (R) Pin 2 (T) Pin 3 (R) Pin 6 (T) Pin 4 (R) Pin 5 (T) Pin 7 (R) Pin 8 (T)	<b>RJ45 B (HDMI B)</b> Pin 1 (R) Pin 2 (T) Pin 3 (R) Pin 6 (T) Pin 4 (R) Pin 5 (T) Pin 7 (R) Pin 8 (T)	
<b>Cable</b>	Two (2) Cat 5e/6 UTP/STP cables (or better) required per port		
<b>Power Supply</b>	One (1) 110-240V/12VDC, 2.5A power supply with three interchangeable blades		
<b>Compatible Receivers</b>	500407, 500417		
<b>Power Consumption</b>	30 Watts		
<b>LED Diagnostics</b>	Power (Blue) Interconnection Matrix (Green)		
<b>Temperature</b>	Operating: 0°C to 40°C Storage: -20°C to 85°C Humidity: Up to 95% non-condensing		
<b>Dimensions</b>	1U Rack Mountable: 19.00" x 7.50" x 1.75" (48.26 cm x 19.05 cm x 4.45 cm)		
<b>Weight</b>	4.0 lb (1.8 kg)		
<b>Regulatory</b>	FCC, CE-EMC Directive 89/336/EE, RoHS, WEEE		
<b>Warranty</b>	Two (2) years		
<b>Order Information</b>	500415: HDMI 4x4 Matrix Switch (includes four [4] IR Emitters)		

## **3.** **Installation Procedure**

### **3.1. Parts List**

The HDMI 4x4 Matrix Switch (500415) comes with the following parts:

- Base Unit
- Four (4) IR Emitters
- One (1) 110-240V/12VDC, 2.5A Power Supply with three interchangeable blades
- One (1) USB Type A – Type B Cable
- One (1) USB flash drive with Port Control Software
- Four (4) rubber feet for set-top operation
- One (1) infrared remote
- Installation Guide

Please verify that all parts are present before proceeding.

### 3.2. Product Overview

The external connections and connection indicators of the HDMI 4x4 Matrix Switch are detailed in Figure 1 and Figure 2. Please familiarize yourself with them before installing the unit.

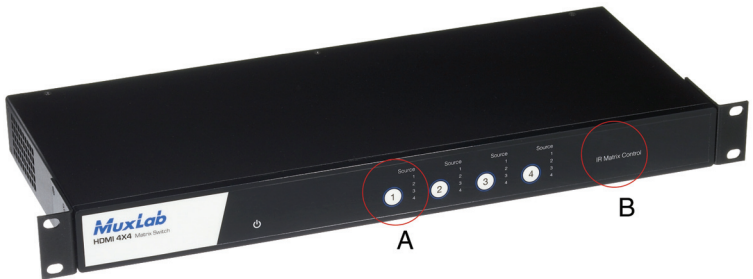


Figure 1: Front Panel of Matrix Switch

Detail A



Display Push Button & HDMI Source LEDs

Detail B



IR Matrix Control LED



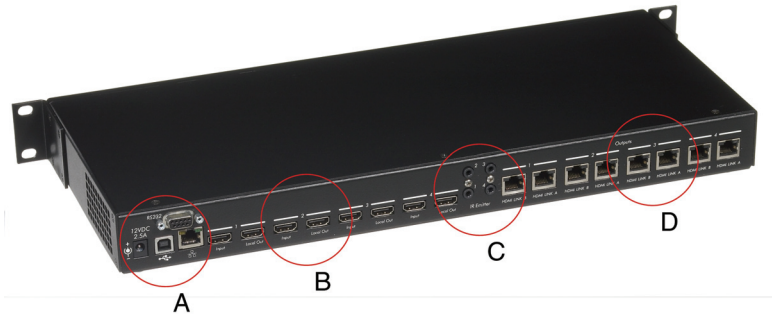
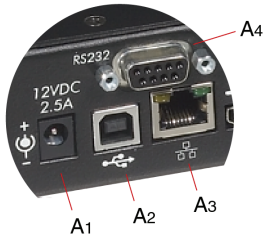


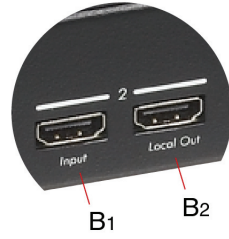
Figure 2: Back Panel of Matrix Switch

Detail A



A1 = Power Supply Port  
A2 = USB Port  
A3 = Ethernet Port  
A4 = RS232 Port

Detail B



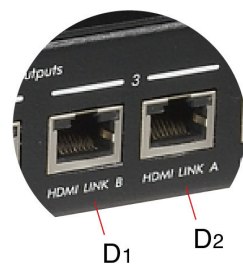
B1 = HDMI Input  
B2 = HDMI Local Out

Detail C



IR Emitter Jacks

Detail D



D1 = RJ45 Output Jack B  
D2 = RJ45 Output Jack A

### **3.3. Pre-Installation Checklist**

The HDMI 4x4 Matrix Switch provides a centralized HDMI switching center via copper UTP/STP cables.

1. The HDMI 4x4 Matrix Switch is used in conjunction with MuxLab's HDMI Receivers (500407 or 500417).
2. The HDMI 4x4 Matrix Switch is typically installed in a remote telecom room and is connected to the HDMI video source and display devices via Cat 5e/6 UTP/STP cables. A MuxLab HDMI Receiver is installed at each HDMI display to support the connection to the Matrix Switch via Cat 5e/6 cables.

### 3.4. Physical Installation

MuxLab’s HDMI 4x4 Matrix Switch comes with mounting brackets for standard 19” rack mounting. Select the final destination for the product and install the unit using standard rack-mount screws.

For set-top installation, the L-brackets on the side of the unit may be removed and the included rubber feet placed on the bottom of the unit. When removing the L-brackets, be careful to keep and reinstall the four screws on each side of the unit.

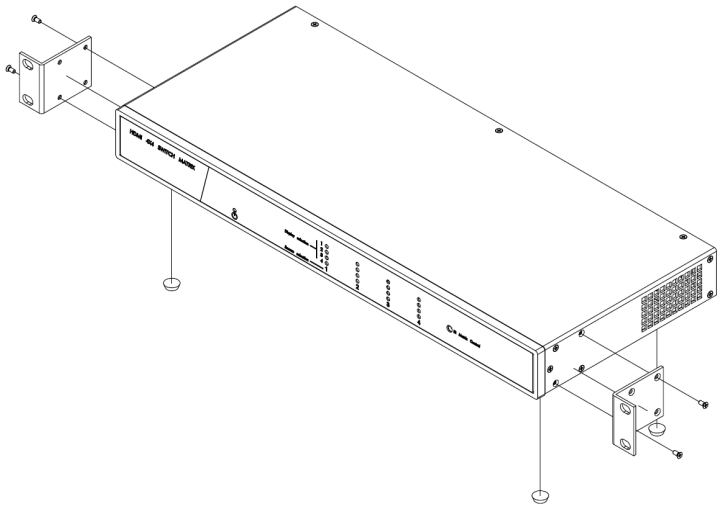


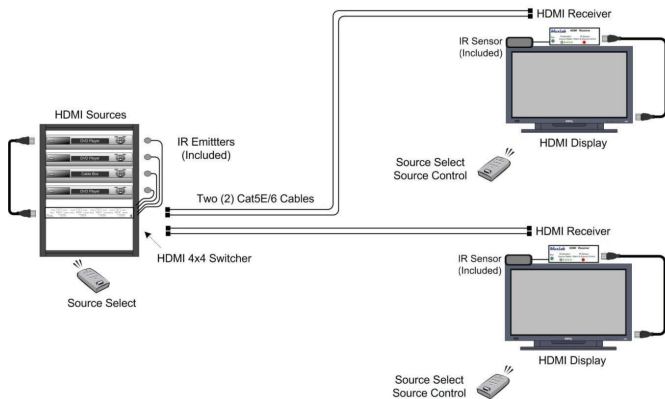
Figure 3: Procedure for Set-Top Installation

## **3.5. Installation Procedure**

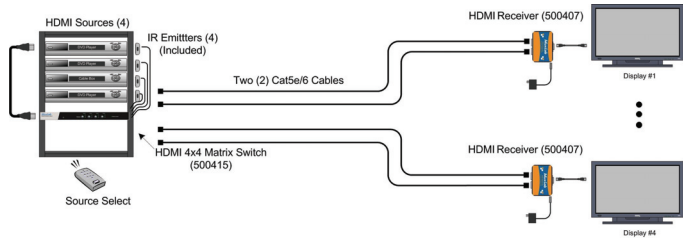
In order to install the product, please follow the steps below:

1. Place the HDMI 4x4 Matrix Switch in its final location.
2. Ensure that the power is turned off on the HDMI source and displays.
3. In order to distribute the HDMI, one (1) HDMI Receiver (500407 or 500417) must be connected at each HDMI display. To install the Receivers, complete Steps 4, 5, and 6.
4. Identify the pin configuration of the Receivers. Two (2) Cat 5e/6 UTP/STP cables are required for each HDMI connection. The pin configuration follows the EIA/TIA 568A/B standard. The HDMI Receiver is reverse-polarity sensitive. Please ensure that the wiring is straight-through (Ring to Ring, Tip to Tip), and that the two HDMI twisted pair links are not crossed.
5. Using an HDMI cable (not supplied), plug each HDMI source to an HDMI input of the Matrix Switch.
6. Using an HDMI cable (not supplied), connect an HDMI Receiver (500407 or 500417) to each HDMI display.
7. Complete the connection between the Matrix Switch and each HDMI display using standard straight-thru

- Cat 5e/6 UTP/STP cables and connecting hardware, terminated on RJ45 plugs at both ends. Ensure that there are no split pairs or taps.
8. Optional: Local televisions may be connected using HDMI cables (not supplied).
  9. Power up the Receivers and HDMI equipment first.
  10. Connect the external 12VDC power supply to the Matrix Switch and plug the power supply into an AC power outlet. If power is present, the blue power LED will be ON.
  11. Ensure that the source and appropriate display LEDs are ON. Images should appear on the displays within 10 seconds. Check the image quality and refer to the troubleshooting table in Section 4 if image quality is unsatisfactory.
  12. Figures 4 and 5 show some typical configurations:



**Figure 4: Typical Configuration (I)**



**Figure 5: Typical Configuration (II)**

Please note that Figure 5 is for users who do *not* require control of the Matrix Switch from a remote location. In such a case, MuxLab’s HDMI Receiver (500407) may be used.

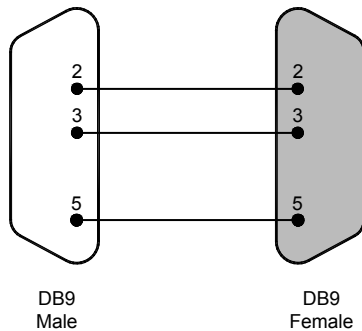
The IR Emitters included with the Matrix Switch are used to control HDMI sources. Simply insert the plug of an IR Emitter into any one of the 4 “IR Emitter” jacks located on the back panel of the Matrix Switch. The number of the jack (1, 2, 3, or 4) into which a specific Emitter is plugged determines which HDMI Source that Emitter will control. For example, an IR Emitter plugged into IR Emitter jack 3 will control HDMI Source 3.

For more information on installing and using IR Emitters, please refer to MuxLab’s *IR Emitter Quick Installation Guide*.

## 3.6. Port Control Operation

### RS-232/USB Control

The HDMI 4x4 Matrix Switch features built-in firmware that allows commands from an ASCII terminal to be sent directly to the device via either a USB or RS-232 connection (not both simultaneously). If connecting with an RS-232 cable, ensure that the cable has the straight-through configuration shown in Figure 6.



**Figure 6: RS-232 Cable Configuration**

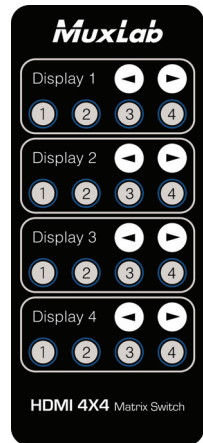
Port Control is performed with either the MuxLab Control Center software, described in Section 3.7, or with a terminal emulator such as the one available under Windows with the ASCII Command Set described in Appendix A. Please note that USB to RS-232 converter cables could result in problems, depending on the quality of the product.

### Manual Control

The HDMI 4x4 Matrix Switch may be controlled manually by using the push buttons located on its front panel. Each “Display” push button controls the particular display corresponding to its number (1, 2, 3, or 4). By pressing on a given Display push button, the user can choose which HDMI Source to send to that display. The number of the HDMI Source being sent to a particular display at any given time is indicated by an illuminated LED next to the “Source” number (1, 2, 3, or 4).

### IR Remote Control

The Remote Control (shown on right) is divided into 4 sections, with each section controlling a particular display. For any given display, the user can choose which HDMI Source to send to that display, either directly by clicking on push buttons 1, 2, 3, or 4, or indirectly by pressing on the left & right arrow push buttons to cycle through HDMI Sources. Note that when the Remote Control is used in conjunction with MuxLab’s HDMI Receiver (500417), the user will only be able to control the display which is connected to the local HDMI Receiver.





### 3.7. Driver Setup

When interfacing a MuxLab device with Windows 2000 (or more recent) operating system, a driver setup file will be required.

To install the MuxLab Control Center software, insert the USB flash drive into the PC. Plug the USB cable between the device and the PC, and power up the device. The **Found New Hardware** wizard will open (Figure 7). Select **Locate and install driver software**.

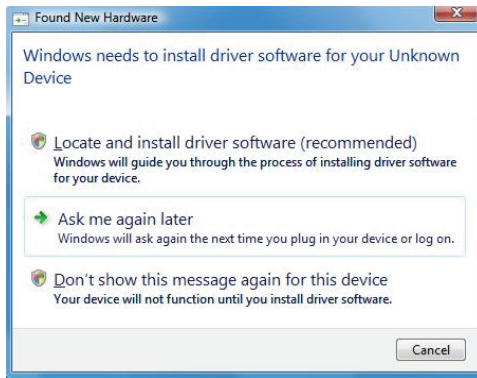
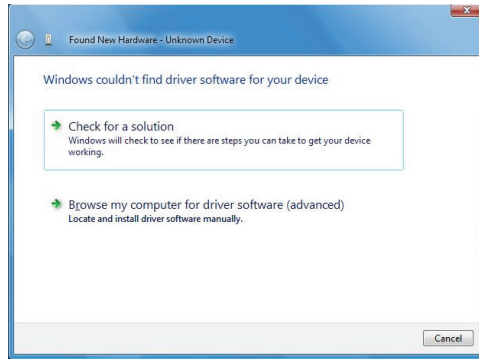


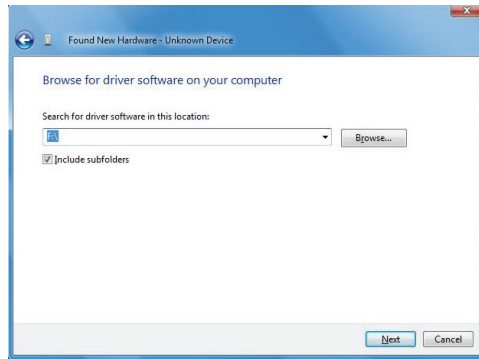
Figure 7: Found New Hardware Wizard

A new dialog box will open (Figure 8). Select **Browse my computer for driver software**.



**Figure 8: Found New Hardware Dialog Box**

Another dialog box will open (Figure 9). Click **Browse** and locate the USB flash drive. Once found, click **Next**.



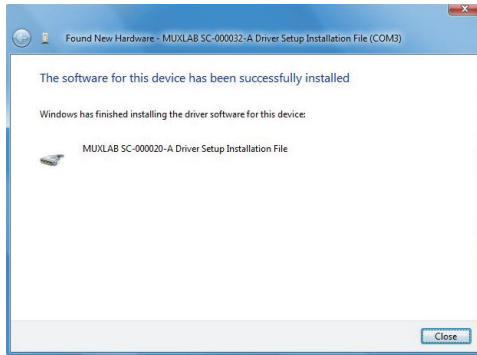
**Figure 9: Browsing for Unknown Device**

A security window will now appear, indicating that the driver software is unsigned (Figure 10). Select **Install this driver software anyway**.



**Figure 10: Windows Security**

A window will appear instructing that the software for the driver has been successfully installed (Figure 11). Click **Close**. You are now ready to launch the MuxLab Control Center software.



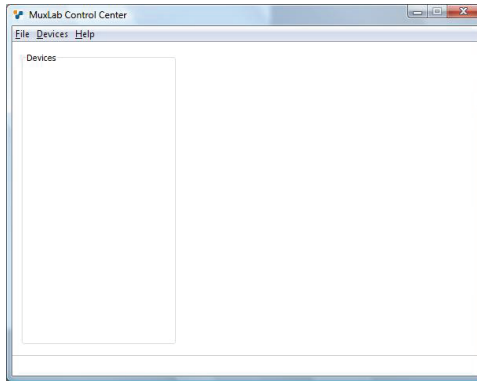
**Figure 11: Successful Installation Dialog Box**

### 3.8. MuxLab Control Center Software

MuxLab provides the user with software for operating the HDMI 4x4 Matrix Switch via a PC. Each Matrix Switch has 4 input ports and 4 output ports, and the MuxLab Control Center software enables the user to select which input port to feed to the output port.

To install MuxLab's Control Center software, insert the USB flash drive into the PC, open the folder, and double click the SC-000032 file.

When running MuxLab's Control Center software for the first time, the main window will appear (Figure 12).



**Figure 12: MuxLab Control Center Main Window**

On the left is the **Devices** tree, which by default is empty. A device may be a Matrix Switch or any other software-controllable MuxLab product. For the purpose of the following discussion, we will consider a Matrix Switch as the device in question.

Once all hardware has been connected, the user must perform the following three steps:

1. Load the Matrix Switch (automatically or manually)
2. Configure the Matrix Switch
3. Control the Matrix Switch

### 1. Loading the Matrix Switch

Loading consists of detecting the Matrix Switch (or any other software-controllable MuxLab device) connected to a PC. Loading can be done either automatically or manually. If done automatically, every device is loaded simultaneously by the software. If done manually, each device must be individually loaded by the user.

Once the Matrix Switch has been successfully loaded, it will be displayed in the **Devices** tree.

To load a device automatically, select **Devices>Load All Connected Devices...** (Figure 13).

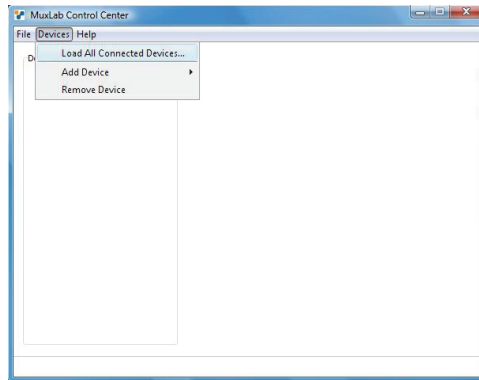
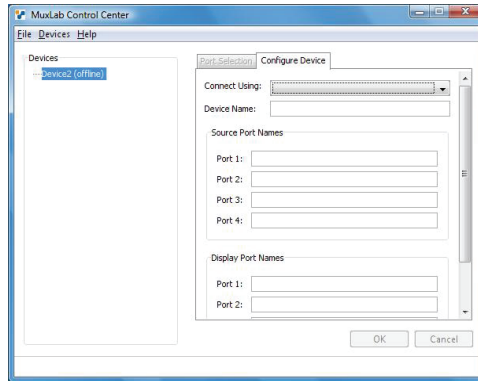


Figure 13: Loading All Connected Devices

Automatic loading detects all devices connected to the PC, as well as the COM port on the PC to which each device is connected.

To load a device manually, select **Devices>Add Device...** This loads devices one at a time, and does not automatically detect the COM port on the PC to which a device is connected. This COM port assignment must be completed in the **Configure Device** tab. Until this assignment is completed by the user, the loaded device will appear in brackets as “offline” in the **Devices** tree (Figure 14).



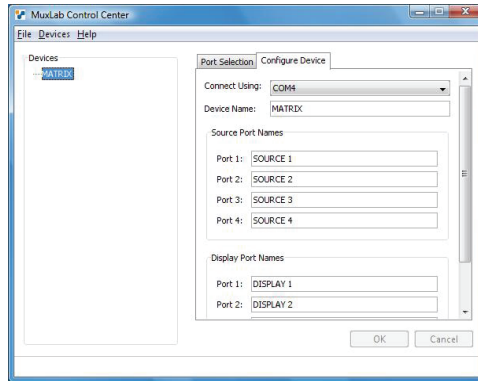
**Figure 14: Offline Device**

## **2. Configuring a Matrix Switch**

Configuring a device consists of three operations:

- (i) Assigning a PC COM port to the Matrix Switch (if Matrix Switch was loaded manually)
- (ii) Naming the Matrix Switch
- (iii) Naming the four input ports and the four output ports on the Matrix Switch

To configure a Matrix Switch, select the device in the **Devices** tree and click the **Configure Device** tab (Figure 15).



**Figure 15: The Configure Device Tab**

If the Matrix Switch has been loaded manually, a COM port on the PC must be selected by clicking the down arrow next to **Connect Using**. The user can select a COM port and then name (or rename) the Matrix Switch (**Device Name**), its source ports (under **Source Port Names**), and its display ports (under **Display Port Names**).

### **3. Choosing a Port Selection Method**

Once the Matrix Switch has been loaded and configured, it can be controlled by the user via the **Port Selection** tab. This consists of selecting which of the Matrix Switch's source ports will be assigned to its display ports.

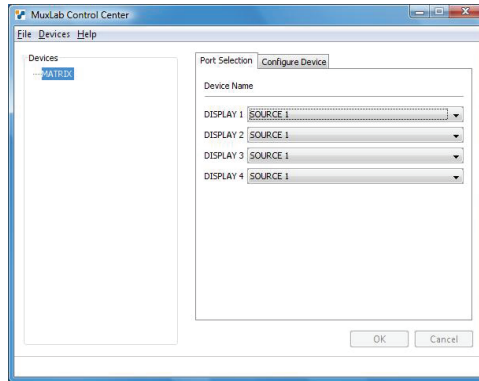


Figure 16: The Port Selection Tab

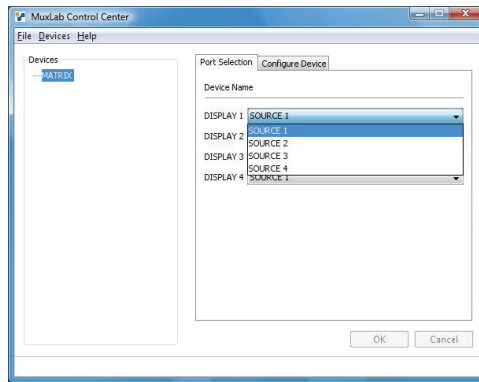


Figure 17: Mapping Displays to Sources



### 3.9. Ethernet Web Interface

MuxLab offers users an Ethernet Web interface that provides the same functionality as our Control Center Software, with speeds between 10 Mbps and 100 Mbps.

For the Ethernet Web interface to function, the Matrix Switch must first be physically connected to an Ethernet network. To do this, locate the RJ45 Ethernet jack on the back panel of the Matrix Switch, then connect it to an Ethernet network using a straight UTP cable (max. length 333 ft [100 m]). There are two LEDs at the top of the RJ45 Ethernet jack: A yellow LED will go on if a link is detected, and a green LED will blink if Ethernet activity is detected.

Once the Matrix Switch has been physically connected to an Ethernet network, go to <http://AAA.BBB.CCC.DDD> (where AAA.BBB.CCC.DDD is the IP address assigned to the device).

The home screen presents users with the option of using a password (Figure 18).

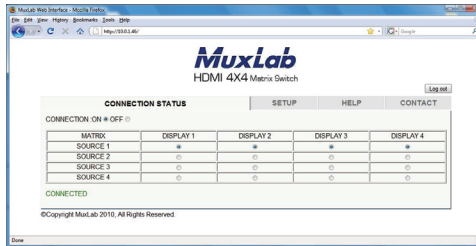


**Figure 18: Web Interface Home Screen**

Passwords are blank by default, meaning that the user just needs to click on **Enter** when logging on for the first time.

**NOTE:** Users who have previously logged on and chosen a password, but subsequently forgot it, may click on **Forgot your password?** in order to retrieve it.

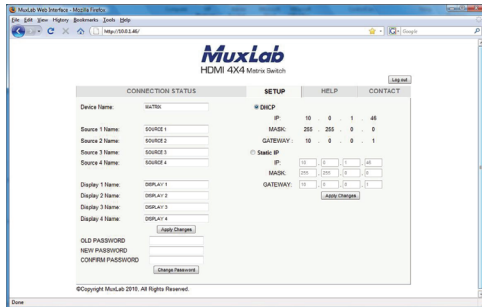
The main window now appears (Figure 19). It contains four tabs and a **Log out** button. The **Connection Status** tab is active by default.



**Figure 19: Connection Tab Screen**

The **Connection Status** tab screen allows the user to understand how sources are mapped to displays. The **Connection On Off** radio buttons on the top left of the tab screen allows the user to halt communication between the Web interface and the device.

The **Setup** tab screen (Figure 20) allows the user to perform three kinds of operations. On the top left, the user can name devices, sources, and ports. Please note that names must alphanumeric and no more than 20 characters long.



**Figure 20: Setup Tab Screen**

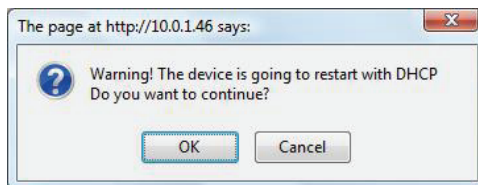
On the bottom left, the user can change passwords (default password is nothing).

On the top right, the user can assign an IP address in either one of two ways:

**DHCP** This tells the network to assign an IP address automatically.

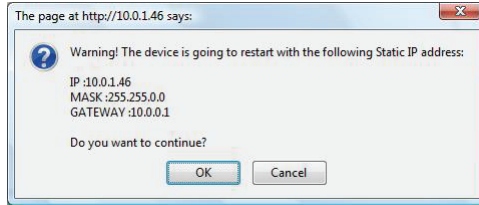
**Static IP** This allows the user to explicitly assign an IP address. Please note that the left-most input fields on the Gateway and IP addresses must be between 1 and 223 inclusively.

Once an IP address has been assigned, the user can click on Apply Changes. If DHCP was used, the dialog box shown in Figure 21 will appear.



**Figure 21: IP Address Assigned by Network**

If a Static IP was used, the dialog box shown in Figure 22 will appear.



**Figure 22: IP Address Assigned by User**

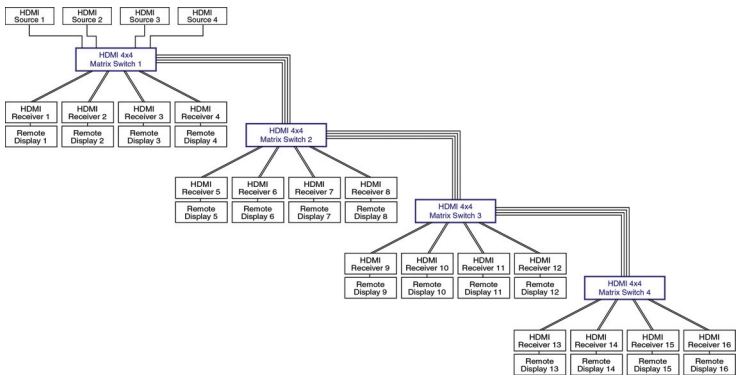
In order to determine an IP address, the user must go to a terminal program and type **ipconfig**. Note that the terminal program uses either a USB or RS-232 serial port.

To determine if DHCP mode is enabled, the user must type **DHCP**. By default, it is enabled.

### 3.10. Cascadability

HDMI 4x4 Matrix Switches may be cascaded in order to send an HDMI signal to more than four (4) displays. In fact by using the local output ports of the Matrix Switch, in theory an unlimited number of Matrix Switches may be connected in a daisy-chain configuration. This is possible because a clean video signal is regenerated at each Matrix Switch.

In more practical terms, up to four (4) Matrix Switches can be cascaded to create a 4x16 matrix. These units would typically be connected in the following way:



When cascading multiple Matrix Switches to create a 4 x  $n$  matrix, it is recommended to name the ports on every Matrix Switch. All the input port names of the matrices should be the same in regards to a given source. For example, imagine an HDMI source designated as “Blu-Ray DVD,” and connected to Input Port 2 of the first Matrix Switch in the chain. Input Port 2 on every other Matrix Switch in the chain should also

be designated as “Blue-Ray DVD.” Each display port name of every Matrix Switch must have a unique name that represents the location of the display (e.g. “Dinner Room, East Wall”). The name of every Matrix Switch should also be unique and indicative of its location.

In terms of the actual physical connections required to cascade multiple Matrix Switches, please follow the steps below:

1. Use an HDMI cable to connect HDMI Source 1 to Input Port 1 of the first Matrix Switch in the chain (“Matrix Switch 1”).
2. Use an HDMI cable to connect HDMI Source 2 to Input Port 2 of Matrix Switch 1
3. Repeat Step 2 for more HDMI sources and the remaining input ports of Matrix Switch 1. The HDMI sources are now all connected to Matrix Switch 1.
4. Use STP/UTP cables to connect the Output Ports on Matrix Switch 1 to the HDMI Receivers (500417 or 500407) located at the Remote Displays for Matrix Switch 1. (This procedure is the same as when connecting a Matrix Switch to Remote Displays in a non-cascaded setup.)

Now to connect Matrix Switch 1 to the second Matrix Switch in the chain (“Matrix Switch 2”).

5. Use an HDMI cable to connect the Local Out 1 port on Matrix Switch 1 to Input Port 1 of Matrix Switch 2. HDMI Source 1 can now transfer signals to Matrix Switch 2.

6. Use an HDMI cable to connect the Local Out 2 port on Matrix Switch 1 to Input Port 2 of Matrix Switch 2. HDMI Source 2 can now transfer signals to Matrix Switch 2.
7. Repeat Step 6 for any remaining HDMI source. All HDMI sources connected to Matrix Switch 1 can now transfer signals to Matrix Switch 2.
8. Use STP/UTP cables to connect the Output Ports on Matrix Switch 2 to the HDMI Receivers (500417 or 500407) located at the Remote Displays for Matrix Switch 2.

Repeat Steps 5-8 for the remaining Matrix Switches being cascaded.

# 4. Troubleshooting

The following table describes some of the problem symptoms, the probable causes and possible solutions. If the information below does not solve the problem, the technical support contact information can be found at the end of this section.

PROBLEM	POSSIBLE SOLUTIONS
No Image	<ul style="list-style-type: none"> <li>• Check that the <b>Power LED</b> (blue) is ON. If not, check power supply.</li> <li>• Check that the source displays are powered.</li> <li>• Check that display devices are ON and Receivers are ON.</li> </ul>
No Image	<ul style="list-style-type: none"> <li>• Check that each display has a source selected.</li> </ul>
No Image	<ul style="list-style-type: none"> <li>• Check that Receivers' <b>Sync LED</b> (green) is ON. Otherwise, check UTP/STP cables.</li> </ul>
No Image	<ul style="list-style-type: none"> <li>• Check that the HDMI source is plugged to the Matrix Switch input, not the local monitor out.</li> <li>• Power down and then power up the Matrix Switch.</li> </ul>
No Image	<ul style="list-style-type: none"> <li>• Connect the display devices directly to the HDMI source to ensure that this works.</li> <li>• Ensure that HDMI cables are less than 6 ft (1.8 m) long.</li> <li>• Ensure that Receivers are powered up and work on their own.</li> <li>• Ensure that Power Supplies are not mixed-up (Matrix Switch requires 2.5 A; Receivers require 500 mA).</li> </ul>
White Dots in image Flickering Image Choppy Sound	<ul style="list-style-type: none"> <li>• Verify cable lengths.</li> <li>• Use STP cables if equipment is located in electrically noisy environment.</li> <li>• If cascading multiple Matrix Switches, ensure that HDMI cables are less than 6 ft (1.8 m) long.</li> </ul>
Wrong Image Appears	<ul style="list-style-type: none"> <li>• Only one source may be connected to the Matrix Switch at any one time. MuxLab does not support switching between input ports.</li> </ul>
Not All Display Devices Work	<ul style="list-style-type: none"> <li>• Ensure that all cable lengths are within specification.</li> <li>• Ensure that the HDMI source is outputting a signal compatible with all the display devices (try 1080i or 480p).</li> </ul>



When contacting your nearest MuxLab dealer or MuxLab Technical Support at 877-689-5228 (toll free in North America) or (+1) 514-905-0588 (International), please have the following information ready:

- Unit model number.
- Cabling layout. Please include the model of the HDMI source and receiver, cable length and type.
- Description of problem.
- List of tests performed.

# 5. Appendix

## A. ASCII Command Set

Ensure that the terminal emulation program parameters are set to the following:

BAUD Rate:	9600
Data bits:	8
Stop bits:	1
Parity:	None
Flow control:	None

It should be noted that commands are case sensitive and arguments must be separated by a single space. Characters that are not supported will be rejected by the response: **ILLEGAL CHARACTER**. Commands must be entered in the following way and ended with a carriage return:

### version

<i>Description:</i>	Returns MuxLab product number & firmware version
<i>Example:</i>	version
<i>Arguments:</i>	[none]
<i>Response:</i>	<b>500XXX Version Y.Y.Y</b> <b>500XXX</b> MuxLab part number <b>Y.Y.Y</b> Firmware version
<i>Example:</i>	500415 Version 1.0.0

**get -a**

*Description:* Returns complete device configuration

*Example:* get - a

*Arguments:* [none]

*Response:*

```
Version X.X.X  
DEVICE: YY..Y  
PORT1 IN: YY..Y  
PORT2 IN: YY..Y  
PORT3 IN: YY..Y  
PORT4 IN: YY..Y  
PORT1 OUT: YY..Y  
PORT2 OUT: YY..Y  
PORT3 OUT: YY..Y  
PORT4 OUT: YY..Y  
STATE PORT1: Z  
STATE PORT2: Z  
STATE PORT3: Z  
STATE PORT4: Z  
X      Firmware version  
YY..Y  Name (up to 20 characters long)  
Z      Port currently selected (1, 2, 3, 4 or  
          0 when no port is selected)
```

*Example:*

```
Version 1.1.0  
DEVICE: R&D MATRIX  
PORT1 IN: CABLE RCV 1  
PORT2 IN: CABLE RCV 2  
PORT3 IN: DVD  
PORT4 IN: PORT4  
PORT1 OUT: BAR 1  
PORT2 OUT: BAR 2  
PORT3 OUT: BAR 3  
PORT4 OUT: DINING  
STATE PORT1: 1  
STATE PORT2: 2  
STATE PORT3: 3  
STATE PORT4: 1
```

**get -n**

*Description:* Returns the name of the device  
*Example:* get -n  
*Arguments:* [none]  
*Response:* **DEVICE: ZZ..Z**  
**ZZ..Z** Name (up to 20 characters long)  
*Example:* DEVICE: MATRIX

**get -p {port number} {type}**

*Description:* Returns the name of a specific port  
*Example:* get -p 2 o  
*Arguments:* **port number**  
Number of port in context (1, 2, 3, or 4)  
**type**  
Type of port in context (i for input, o for output)  
*Response:* **PORTX Y: ZZ..Z**  
**X** Port number (1, 2, 3, or 4)  
**Y** Port type (IN for input, OUT for output)  
**ZZ..Z** Name (up to 20 characters long)  
*Example:* PORT2 OUT: BAR 1

**get -s {output port number}**

*Description:* Returns the current state of a specific output port  
*Example:* get -s 2  
*Arguments:* **output port number**  
Number of port in context (1, 2, 3, or 4)  
*Response:* **STATE PORTX: Y**  
**X** Port number (1, 2, 3, or 4)  
**Y** Port currently selected (1, 2, 3, 4 or 0 when no port is selected)  
*Example:* STATE PORT2: 1

**set -d**

*Description:* Resets ports and device names to default settings

*Example:* set -d

*Arguments:* [none]

*Response:* [Names reset to default values]

**set -n {name}**

*Description:* Sets a device's name to a new specified name

*Example:* set -n R&D MATRIX

*Arguments:* **name** new specified name

*Response:* **DEVICE: YY..Y**  
**YY.. Y** Name (up to 20 characters)

*Example:* DEVICE: MATRIX

**set -p {port number} {type} {name}**

*Description:* Sets the specific port's name to a new specified name

*Example:* set -p 2 o Bar's TV

*Arguments:* **port number**  
Number of port in context (1, 2, 3, or 4)  
**type**  
Type of port in context ('i' for input, 'o' for output)  
**name**  
New specified name

*Response:* **PORTX Y: ZZ..Z**  
**X** Port number (1, 2, 3, or 4)  
**Y** Port type (IN for input, OUT for output)  
**ZZ..Z** Name (up to 20 characters)

*Example:* PORT2 OUT: Bar's TV

**select {output port number} {input port number}**

*Description:* For a given output port, selects the appropriate input port

*Example:* select 2 1

*Arguments:* **output port number**  
The output port number (1, 2, 3, or 4)

**input port number**  
The input port number for selection (1, 2, 3, or 4)

*Response:* **PORTX OUT: PORTY IN SELECTED**  
**X** Output Port in context (1, 2, 3, or 4)  
**Y** Input currently selected (1, 2, 3, or 4)

*Example:* **PORT2 OUT: PORT1 IN SELECTED**

## B. Serial Port and LAN Setup

### 1. SERIAL PORT COMMANDS

#### Console

*Description:* Sets or displays the console configuration

*Usage:* console [-<opt> <value>]

*Options:* -d Default Setting  
-s <9600/19200/38400/57600> Communication Speed

*Example:* Console Configuration

-----	
Baud Rate	9600, N, 8, 1

### 2. LAN COMMANDS

#### dhcp

*Description:* Sets or displays the dhcp configuration

*Usage:* dhcp [-<opt> <value>]

*Options:* -d Default Settings  
-i <nnn.nnn.nnn.nnn> Server IP Address  
-m <enable|disable> Power-up mode

*Example:* DHCP Client Configuration

-----	
Power Up Mode	Enabled

#### ipconfig

*Description:* Displays the current LAN interface configuration

*Usage:* ipconfig

*Example:* Ethernet Interface Configuration

-----	
MAC Address	00A0E50000A9
IP Address	010.000.101.016
Subnet Mask	255.255.000.000
Default Gateway	010.000.101.001

## 2. LAN COMMANDS (continued)

### reset

*Description:* Resets the unit

*Usage:* reset

### help

*Description:* Get command list or command description

*Usage:* help <command>

### <command> -?

*Description:* Get command list or command description

*Usage:* <command> -?

*Example:* get -?

### system

*Description* Sets or displays the general system configuration

*Usage:* system [-<opt> <value>]

*Options:*

-d	Default Settings
-i <nnn.nnn.nnn.nnn>	Product IP Address
-s <nnn.nnn.nnn.nnn>	Subnet mask
-g <nnn.nnn.nnn.nnn>	Default Gateway

*Example:* System Configuration

---

System Description	HDMI 4X4 Matrix Switch
MAC Address	00A0E50000A9
IP Address	010.000.101.016
Subnet Mask	255.255.000.000
Default Gateway	020.000.000.001
System Name	Restaurant
Display 1 Name	Bar Section
Display 2 Name	Front Section
Display 3 Name	Back Section
Display 4 Name	VIP Section
Source 1 Name	Dish Network
Source 2 Name	Bell TV
Source 3 Name	Illico
Source 4 Name	Blu-Ray Player



## C. Infrared Remote Control Codes

Custom Code: 00FF

Code (hex)	Identification	
	Section	Button
02	Display 1	<
03		>
4A		1
04		2
05		3
06		4
08	Display 2	<
09		>
15		1
51		2
52		3
00		4
1D	Display 3	<
53		>
1A		1
59		2
40		3
16		4
0D	Display 4	<
4B		>
5F		1
5B		2
4F		3
57		4

## 6. Product Warranty Policy

### Items Under Warranty - Company Policy

MuxLab guarantees its products to be free of defects in manufacturing and workmanship for the warranty period from the date of purchase. If this product fails to give satisfactory performance during this warranty period, MuxLab will either repair or replace this product at no additional charge, except as set forth below. Repair and replacement parts will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of MuxLab. This limited warranty does not include repair services for damage to the product resulting from accident, disaster, misuse, abuse, or unauthorized modifications or normal decay of battery driven devices. Batteries, if included with the product, are not covered under this warranty.

Limited warranty service can be obtained by delivering the product during the warranty period to the authorized MuxLab dealer from whom you purchased the product, or by sending it to MuxLab. MuxLab will not accept any such product for repair without a Return Material Authorization number (RMA#) issued by its Customer Service Department and a proof of purchase date. If this product is delivered to MuxLab by mail, you agree to assume risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or equivalent.

THE ABOVE LIMITED WARRANTY IS THE ONLY WARRANTY COVERING YOUR MUXLAB PRODUCT. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER, YOUR SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED FOR ABOVE. IN NO EVENT SHALL MuxLab BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING ANY LOSS OF PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE THIS PRODUCT, EVEN IF MUXLAB OR AN AUTHORIZED MuxLab DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES; NOR WILL MUXLAB BE LIABLE FOR ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

**Warranty Periods**

*Any product found to be defective within three (3) months of invoice, including one (1) month shelf life, may be returned for replacement by a new unit or a satisfactory repair within one (1) month of receiving any returned product. The customer must provide MuxLab with the serial number and proof of purchase of the defective unit being returned. All R.M.A.'s issued are subject to inspection by MuxLab, and will be returned to customer if not properly package – units must be returned in original container or equivalent. MuxLab will not accept any such product for repair without an authorization for its Technical Support department and without a return authorization number issued by MuxLab Customer Service department. For credit & replace R.M.A., customer will be liable to pay replacement invoice if defective products are not returned.*

Product more than six months old, including shelf life.

The defective unit must be returned prepaid to MuxLab and then the unit will be repaired or if repair is not possible, replaced by an equivalent unit and returned to the customer within one (1) month of receiving any returned product. There is no charge for repair (parts and labor) during the full warranty period.

**Items Defective and not under Warranty**

*For products which are no longer under warranty the policy is repair and return. An amount of 25% of the products published list price at the time of purchase will be charged. Customer must issue a purchase order to cover the cost of repair.*

*Each unit will be returned to the customer within one (1) month from receipt of the unit by MuxLab. The defective unit must be returned prepaid to MuxLab. The repaired unit will be returned to the customer FOB MuxLab. The repaired unit has a 90 day warranty.*

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