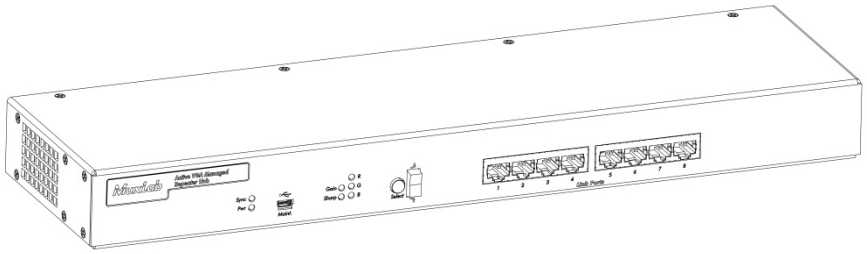
Active VGA Managed Repeater Hub
500172



Installation Guide

P/N: 94-000716-A SE-000716-A

MuxLab

Table of Contents

1. System Overview

1.1. Description

MuxLab's family of Active VGA Managed products allows a single video source to be transmitted to various remote locations in a point-to-multipoint configuration for cost-efficient connectivity.

The Active VGA Managed family consists of three products:

(1) Active VGA Managed Dispatcher
(2) Active VGA Managed Receiver
(2) Active VGA Managed Repeater Hub

A video source is connected to the Dispatcher, which in turn distributes the source signal to Receivers placed in locations as far as 1,000 feet (305 meters) away. Each Receiver then transmits this signal to as many as two display devices. Working alone, the Dispatcher (8 or 16 port) can distribute signals to as many as 8 or 16 remote locations.

A Repeater Hub is used whenever a source signal must be distributed to more than 8 or 16 remote locations, or over a distance of more than 1,000 feet. The Repeater Hub receives the source signal from the Dispatcher, amplifies and equalizes it, and then distributes it to as many as 8 Receivers located as far as 1,000 feet away.

Because the Repeater Hub itself can be located as far as 1,000 feet away from the Dispatcher, the effective distance from Dispatcher to Receiver is therefore doubled to 2,000 feet (610 meters). Furthermore, since the Dispatcher (8 or 16 port) can distribute signals to as many as 8 or 16 Repeater Hubs, each of which in turn can distribute signals to 8 Receivers, the number of remote locations that receive source signals increases by 7 with each Repeater Hub used.

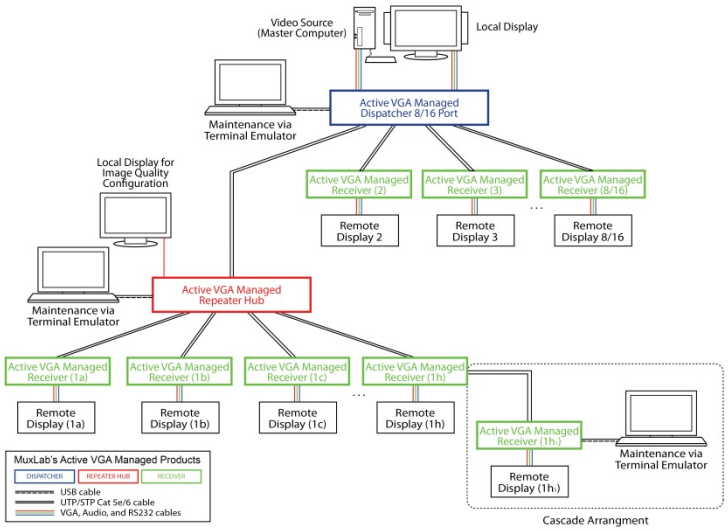


Figure 1: System Overview

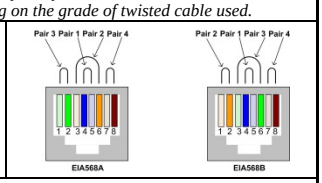
The Repeater Hub supports up to 1920 x 1200 pixels and 1080p resolution, and is DDC compliant with all plug-and-play laptops, PCs, and displays.

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. System Features

- Supports VGA, Audio & RS232
- Support up to 1,000 ft (305 m)
- Support up to 1920 x 1200, 1080p (depending on cable length)
- Software and manual adjustments for brightness, sharpness & skew
- Additional 1,000 ft (305 m) via Repeater Hub
- Cascadability option from Receiver
- Structured cabling approach: Repeater Hubs have RJ45 for signal distribution
- Dual head capability on Receiver

2. Technical Specifications

Active VGA Managed REPEATER HUB	
Environment	VGA, Analog Stereo Audio, RS232
Devices	PC, laptops, projectors, plasma, switchers, distribution amps, touchscreen
Transmission	Transparent to the user
Maximum resolution	1080p; 1920 x 1200
Connections	FRONT PANEL — Maintenance: One (1) Mini USB; Link Ports: Eight (8) RJ45S BACK PANEL — *Local Out:* VGA: One (1) HD15F; *Local In:* Link: One (1) RJ45S; Power: One (1) power jack
Maximum Distance: Repeater Hub to Receiver	Up to 1920 x 1200 @ 60Hz; 1080P (depending on cable length) Up to 1,000 feet (305 meters) *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.*
RJ45 Pin Configuration *Reverse Polarity Sensitive* *Use EIA/TIA 568A or 568B straight-through wiring*	Green: Pin 4 (R) Pin 5 (T) Blue: Pin 1 (R) Pin 2 (T) Red: Pin 7 (R) Pin 8 (T) COM: Pin 3 (R) Pin 6 (T) 
LED Indicators	Sync: One (1) green LED Power: One (1) green LED Sharpness One (1) green LED Gain One (1) green LED R One (1) green LED G One (1) green LED B One (1) green LED
Cable	Cat 5e/6 unshielded twisted pair (or better)
Power Supply	110-240V/12VDC/1.25A power jacks Removable AC blades included for North America, Continental Europe & UK
Compatible Products	500170, 500171, 500174
Power Consumption	15 Watts
Temperature	Operating: 0ºC to 40ºC Storage: -20ºC to 85ºC Humidity: Up to 95% non-condensing
Dimensions	1U Rack Mountable Enclosure Dimensions: 17.15” x 4.69” x 1.72” (43.56 cm x 11.91 cm x 4.37 cm)
Weight	3.8 lb (1.7 kg)
Regulatory	FCC, CE-EMC Directive 89/336/EE, RoHS, WEEE
Warranty	Two (2) years
Order Information	500172: Active VGA Managed Repeater Hub (8 Port)

3. Installation Procedure

3.1. Parts List

The Active VGA Managed Repeater Hub (500172) comes with the following parts:

- Base Unit
- One (1) 110-240V/12VDC, 1.25A Power Supply with three interchangeable blades
- Quick Reference Support Sheet
- Four (4) rubber feet

Please verify that all parts are present before proceeding.

3.2. Product Overview

The external connections and connection indicators of the Active VGA Managed Repeater Hub are detailed in Figures 2 and 3. Please familiarize yourself with them before installing the unit.

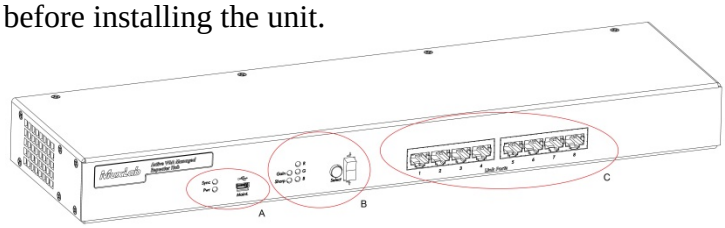
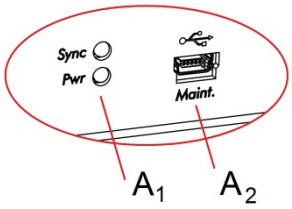
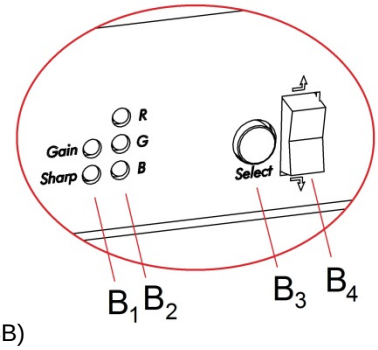


Figure 2: Front Panel of Repeater Hub



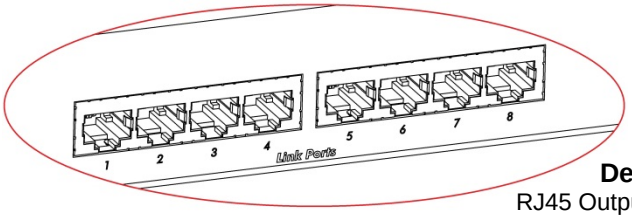
Detail A

A_1 = Status LEDs
A_2 = Maintenance Port (Mini USB)



Detail B

B_1 = Gain & Sharpness LEDs
B_2 = Red, Green, Blue Skew LEDs
B_3 = Select Switch
B_4 = Rocker Switch



Detail C

RJ45 Outputs Link Ports

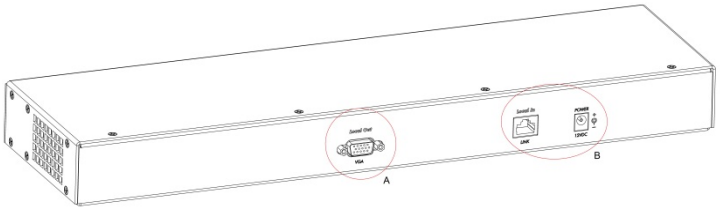
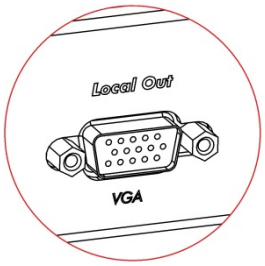
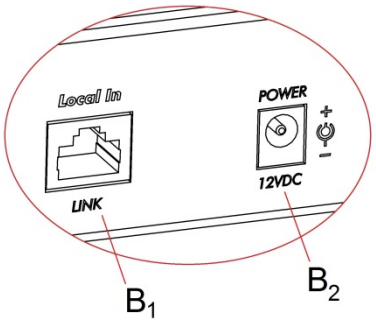


Figure 3: Back Panel of Repeater Hub



Detail A

VGA Local Out



Detail B

B_1 = Local In Link Port
B_2 = Power Supply Plug

3.3. Pre-Installation Checklist

Prior to installing the Active VGA Managed Repeater Hub, please ensure that the maximum routing distance from Dispatcher to Repeater Hub does not exceed 1,000 feet (305 meters). Likewise, please ensure that the maximum routing distance from Repeater Hub to Receiver does not exceed 1,000 feet.

3.4. Physical Installation

MuxLab's Active VGA Managed Repeater Hub 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.

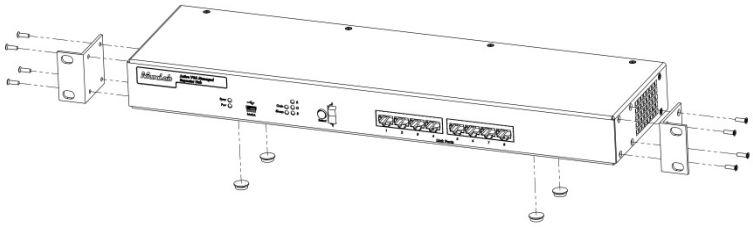


Figure 4: Procedure for Set-Top Installation

3.5. Installation Procedure

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

1. Place the Active VGA Managed Repeater Hub in its final location.
2. Connect the Dispatcher to the Repeater Hub by using a UTP/STP Cat 5e/6 cable. This cable connects from the Dispatcher's front panel to the LINK (Local In) port located on the Repeater Hub's back panel.
3. Optional: Connect a local display to the Repeater Hub via the VGA (Local Out) port located on the Repeater Hub's back panel.
4. Connect the Repeater Hub to Receivers using UTP/STP Cat 5e/6 cables. These cables connect from the Link Ports located on the Repeater Hub's front panel to the LINK IN port located on the back panel of each Receiver.
5. Power up the Dispatcher, Receivers, and local displays.
6. Connect the external 12VDC power supply to the Repeater Hub and plug the power supply into an AC power outlet. If power is available, the power LED will be ON.
7. Ensure that the source and appropriate displays are on. Images should appear on the displays. Check the image quality and refer to the troubleshooting table in Section 4 if image quality is unsatisfactory.

8. Figure 5 shows a typical configuration:

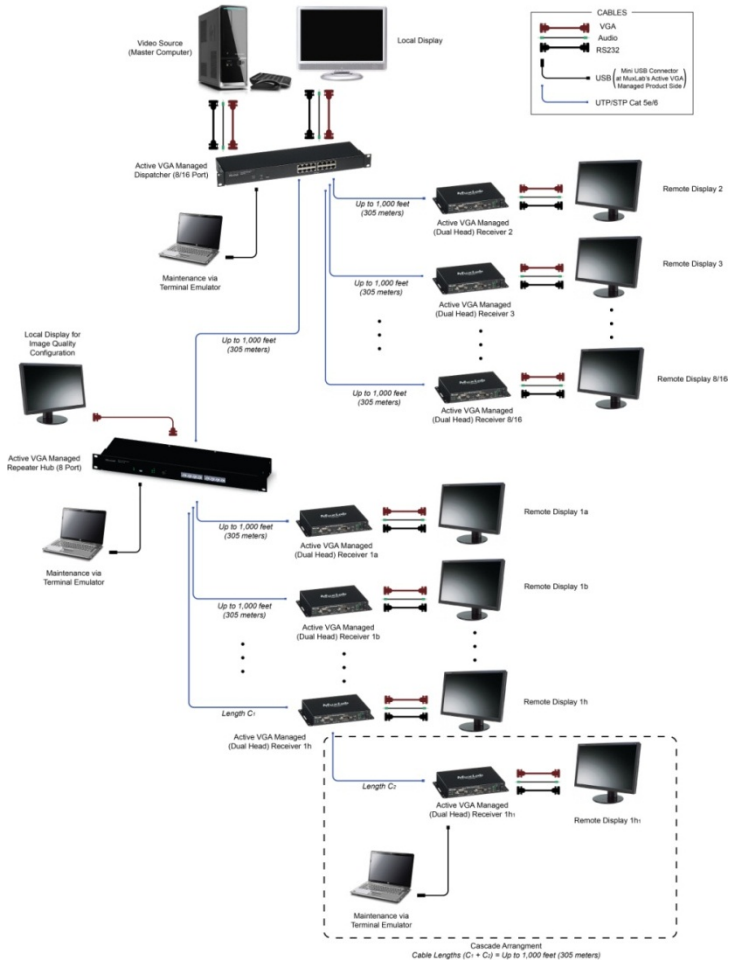


Figure 5: Typical Repeater Hub Configuration

3.6. Manual Image Control

The image generated by MuxLab's Active VGA Managed Repeater Hub may be manually controlled via the Select button and rocker switch (and their associated LEDs) located on the Repeater Hub's front panel (Figure 6).

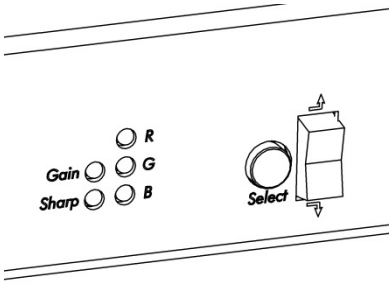


Figure 6: Manual Image Control Buttons and LEDs

To adjust the image, the user presses the Select button until the LED corresponding to the image adjustment category turns on. There are five categories possible: (1) Gain; (2) Sharpness; (3) Red Skew; (4) Green Skew; and (5) Blue Skew.

Once the user has selected a category, it can be adjusted by pressing the rocker switch up or down. When completed, the user can move to the next category by pressing the Select button again. The Select button cycles through all five adjustment categories, and the LED corresponding to the last adjustment made by the user will remain on.

When making an adjustment, the selected LED will flicker quickly, but will stop flicking once the minimum or maximum setting is reached. The rocker switch can be kept depressed for a faster adjustment.

3.7. Port Control Operations

MuxLab's Active VGA Managed Repeater Hub may be controlled in any one of two different ways:

1. RS232 Control
2. USB Control

1. RS232 Control

The Active VGA Managed Repeater Hub features built-in firmware that allows commands from the computer unit running MuxLab's Control Central software to be sent directly to the Repeater Hub via an RS232 connection. If connecting with an RS232 cable, ensure that the cable has the straight-through configuration shown in Figure 7.

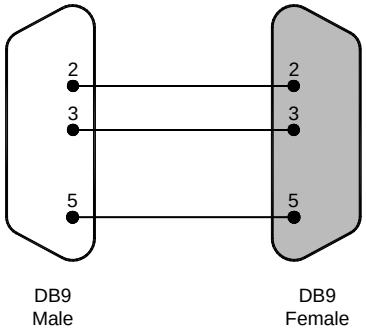


Figure 7: RS232 Cable Configuration

Port Control is performed with MuxLab's Active VGA Managed Software, described in the *Active VGA Managed Software Installation Guide*.

Please note that USB to RS232 converter cables could result in problems, depending on the quality of the converters.

2. USB Control

The Active VGA Managed Repeater Hub features built-in firmware that allows commands from an ASCII terminal to be sent directly to the Repeater Hub via a USB connection only for maintenance purposes.

Maintenance is performed with a terminal emulator, such as the one available under Windows with the ASCII Command Set described in the Appendix.

3.8. 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, go to www.muxlab.com and download the SC-000032-A USB to Serial Driver. Plug the USB cable between the device and the PC, and power up the device. The **Found New Hardware** wizard will open (Figure 8). Select **Locate and install driver software**.

Figure 8: Found New Hardware Wizard

A new dialog box will open (Figure 9). Select **Browse my computer for driver software**.

Figure 9: Found New Hardware Dialog Box

Another dialog box will open (Figure 10). Click **Browse** and locate the SC-000032-A file that you downloaded. Once found, click **Next**.

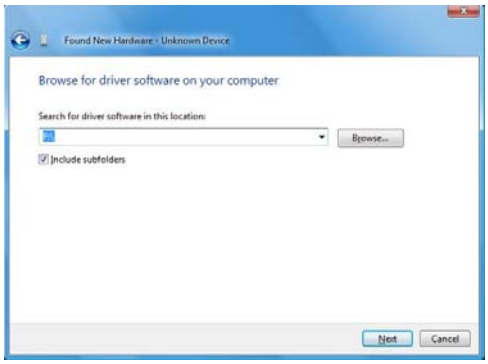


Figure 10: Browsing for Unknown Device

A security window will now appear, indicating that the driver software is unsigned (Figure 11). Select **Install this driver software anyway**.

Figure 11: Windows Security

A window will appear instructing that the software for the driver has been successfully installed (Figure 12). Click **Close**. You are now ready to launch the MuxLab Control Center software.

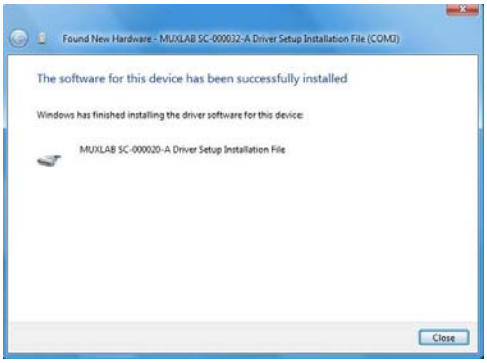


Figure 12: Successful Installation Dialog Box

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	• Check that the Power LED is ON. (If not, check the power supply.) • Check that the source PC is ON. • Check that the local monitor is ON.
No Image	• Check that the Sync LED of the Dispatcher is ON.
No Image	• Check that the Sync LED of the Receivers is ON. (Otherwise, check UTP/STP cables.)
No Image	• Check that the source is plugged into the Dispatcher's input, not into the local monitor out. • Power down, and then power up the Dispatcher.
No Image	• Check that the Receivers are powered up and that the Power LED is ON. • Check that the power supplies are not mixed up (Dispatcher & Repeater Hub require 1.25A power supply. Receiver requires 0.5A power supply).
Choppy Sound	• Check cable lengths. • Use STP cables if equipment is located in electrically noisy environment. • When cascading multiple Receivers, ensure that the combined cable length of all segments comprising the cascade does not exceed 1,000 feet (305 meters).
Smeared Picture	• Check cable lengths. • Adjust Sharp and Gain controls. • When cascading multiple Receivers, ensure that the combined cable length of all segments comprising the cascade does not exceed 1,000 feet (305 meters).
Not All Display Devices Work	• Check cable lengths. • Check that video source is outputting a signal that is compatible with all the display devices (try 480p or 720p).

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 video card and display monitor(s), as well as cable types and lengths.
- Description of problem.
- List of tests performed.

5. Appendix

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

Description:	Returns MuxLab product number & firmware version
Example:	version
Arguments:	[none]
Response:	**500XXX Version Y.Y.Y** **500XXX** MuxLab part number **Y.Y.Y** Firmware version
Example:	500172 Version 1.0.0

get –a

Description:	Returns complete device configuration	
Example:	get –a	
Arguments:	[none]	
Response:	**Device:**	**[YY..Y]**
	Sharpness:	**[Z]**
	Brightness:	**[Z]**
	Red Skew:	**[Z]**
	Green Skew:	**[Z]**
	Blue Skew:	**[Z]**
	YY..Y	Name (up to 20 characters long)
	Z	Value (percentage from 0 to 100%)
Example:	Device:	[REPEATER]
	Sharpness:	[2]
	Brightness:	[100]
	Red Skew:	[33]
	Green Skew:	[56]
	Blue Skew:	[78]

get –n

Description:	Returns the name of the device	
Example:	get –n	
Arguments:	[none]	
Response:	**Device:**	**[YY..Y]**
	YY..Y	Name (up to 20 characters long)
Example:	Device:	[REPEATER]

get –s

Description:	Returns the sharpness value	
Example:	get –s	
Arguments:	[none]	
Response:	**Sharpness:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Sharpness:	[2]

get –t

Description:	Returns the brightness value	
Example:	get –t	
Arguments:	[none]	
Response:	**Brightness:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Brightness:	[100]

get –r

Description:	Returns the red skew value	
Example:	get –r	
Arguments:	[none]	
Response:	**Red Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Red Skew:	[33]

get –g

Description:	Returns the green skew value	
Example:	get –g	
Arguments:	[none]	
Response:	**Green Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Green Skew:	[56]

get –b

Description:	Returns the blue skew value	
Example:	get –b	
Arguments:	[none]	
Response:	**Blue Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Blue Skew:	[78]

set –n {name}

Description:	Sets a device's name to a new specified name	
Example:	set –n REPEATER2	
Arguments:	**name** new specified name	
Response:	**Device:**	**[YY..Y]**
	YY.. Y	Name (up to 20 characters)
Example:	Device:	[REPEATER2]

set –s {sharpness}

Description:	Sets a device's sharpness value	
Example:	set –s 26	
Arguments:	**sharpness** new sharpness value	
Response:	**Sharpness:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Sharpness:	[26]

set –t {brightness}

Description:	Sets a device's brightness value	
Example:	set –t 63	
Arguments:	**brightness** new brightness value	
Response:	**Brightness:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Brightness:	[63]

set –r {redskew}

Description:	Sets a device's red skew value	
Example:	set –r 47	
Arguments:	**redskew** new red skew value	
Response:	**Red Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Red Skew:	[47]

set –g {greenskew}

Description:	Sets a device's green skew value	
Example:	set –t 88	
Arguments:	**greenskew** new green skew value	
Response:	**Green Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Green Skew:	[88]

set –b {blueskew}

Description:	Sets a device's blue skew value	
Example:	set –t 11	
Arguments:	**blueskew** new blue skew value	
Response:	**Blue Skew:**	**[Z]**
	Z	Value (percentage from 0 to 100%)
Example:	Brightness:	[11]

reset

Description:	Resets the unit	
Usage:	reset	
Options:	-f	Sets to factory default

help

Description:	Get command list or command description
Usage:	help <command>

<command> -?

Description:	Get command list or command description
Usage:	<command> -?
Example:	get -?

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 (RMA) number 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 having been received by MuxLab. The customer must provide MuxLab with the serial number and proof of purchase of the defective unit being returned. All RMAs issued are subject to inspection by MuxLab, and will be returned to the customer if not properly packaged – units must be returned in their original container or equivalent. MuxLab will not accept any such product for repair without an authorization for its Technical Support department and without an RMA number issued by MuxLab's Customer Service department. For credit and replacement RMAs, the customer will be liable to pay the replacement invoice if defective products are not returned.

Products More than Six Months Old, Including Shelf Life

The defective unit must be returned prepaid to MuxLab, and the unit will be repaired. If repairing the unit is not possible, it will be replaced by an equivalent unit and returned to the customer within one (1) month of having been received by MuxLab. There is no charge for repair (parts and labor) during the full warranty period.

Products Defective and Not Under Warranty

MuxLab's policy is to repair and return any defective MuxLab products that are no longer under warranty. An amount of 25% of the unit's published list price at the time of purchase will be charged. The customer must issue a purchase order in order to cover repair costs.

Each unit will be returned to the customer within one (1) month of having been received 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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