VideoEase™ LongReach™16 Active CCTV Receiver Hub (500120,500121,500122,500123)

Installation Guide

P/N: 94-000369-C, SE-000405-C

MuxLab

Table of Contents

1. Overview

1.1. Description

The LongReach 16 is a 16-port Active CCTV Receiver Hub that provides a centralized cabling solution for medium and large CCTV installations via copper twisted pair.

The LongReach 16 features Automatic Gain Control for picture brightness, sharpness and contrast, thereby helping to reduce on-site service calls. The LongReach 16 supports up to 4,500 ft (1,371m) via Category 5/6 twisted pair cable when used in conjunction with MuxLab's passive CCTV Baluns (p/n 500000, 500009, 500022 and 500023) at the camera end.

The LongReach 16 automatically adjusts the brightness, sharpness and color intensity of the video signal based on the actual cable conditions such as cable grade, distance, environmental effects on the cable, etc. Any further enhancements to the image may be made at the camera, monitor, multiplexer or DVR. The product requires a floating 24VAC, 40VA power transformer (included) and connects directly to the DVR or CCTV multiplexer.

There are two models as shown in the photos below; The 500120 and the 500122. The 500120 features UTP on both input and output for installation in remote telecom or wiring rooms. The 500122 features UTP on the input and coax on the output for installation next to the central monitoring (DVR or multiplexer) equipment.

500120

500122

1.2. Features

- Up to 4,500 ft via Cat 5/6 UTP with passive CCTV Balun at camera.
- Automatic Gain Control for brightness and sharpness.
- Ground Loop Blocking up to +/- 50V
- Diagnostic LEDs
- Adjustable for rackmount, wallmount or desktop
- Works with passive CCTV Baluns (p/n 500000, 500009, 500022, 500023)
- Requires floating 24VAC, 60 VA power transformer (included)
- 1 year warranty

2. Technical Specifications

Environment	CCTV equipment for security and surveillance. RS-343 (RS-170) NTSC, PAL
Devices	CCTV cameras, DVR, IP camera encoders, monitors, switchers, multiplexers and other CCTV equipment.
Transmission	Transparent to the user
Bandwidth	DC to 4.5 MHz.
Input	1.5 Vp-p max, 100Ω, balanced
Output	1.1 Vp-p, ± 1 dB, 75Ω, unbalanced
Insertion Loss	-14 dB minimum for luma, -60 dB minimum for chroma. Determined by Automatic Gain Control.
Return Loss	Greater than 15 dB over the frequency range
Common Mode Rejection Ratio	Greater than 40 dB @ 3.85 MHz
Maximum Distance via Cat 5/6 UTP*	NTSC: Camera to Hub: 4,000 ft (1,219m); Hub to DVR:500 ft (152m). Total:4,500' (1,371m) PAL: Camera to Hub: 3,000 ft (914m); Hub to DVR: 350 ft (107m). Total: 3,350' (1,021m). *Longer distances may be achieved when connected directly to a CCTV monitor.
Automatic Gain Control (AGC)	Automatic Gain Control for sharpness and luminosity.
LED Indicators	Power: One (1) green LED. Video Sync: Sixteen (16) green LEDs.
Cable – UTP	24 gauge or lower solid copper twisted pair wire impedance: 100 ohms at 1 MHz. Maximum capacitance: 20 pf/foot. Attenuation: 6.6 dB/1000 ft at 1 MHz
Cable – BNC	Impedance: 75 ohms at 1 MHz (RG59/U or RG6).
Connectors* ****reverse polarity sensitive.***	Video In from cameras: Sixteen (16) 2-pole screw terminals Video Out to DVR: Sixteen (16) 2-pole screw terminals or sixteen (16) BNC-F Ground: One (1) chassis ground lug
Compatible Baluns	500000, 500009, 500021, 500022, 500023
Power Consumption – Max.	40W RMS max. @ 24VAC RMS typical (floating; +15%, -10%)
Power Transformer (Included)	North America: 110V/24VAC/60VA. Europe: 220-240/24VAC/70VA
Video Ground Loop Isolation	± 50V max permanent voltage. ±100V max surge for 3 seconds
Fuse Rating	3A
Temperature	Operating: 0° to 40°C. Storage:-20° to 85°C. Humidity: up to 95% non-cond.
Enclosure	Black
Mounting	Rack mount (factory default). Removable brackets for wall mount or desktop installation. Rubber stand-offs included for desktop installation.
Dimensions	19" x 8.6" x 1.75" (48.3 x 21.7 x 4.4 cm)
Weight	4.4 lbs (2 kg)
Regulatory	FCC and CE
Warranty	1 year
Order Information	500120 LongReach 16 Active CCTV Hub, UTP/UTP, 110V/24VAC 500121 LongReach 16 Active CCTV Hub, UTP/UTP, 220-240V/24VAC 500122 LongReach 16 Active CCTV Hub, UTP/Coax, 110V/24VAC 500123 LongReach 16 Active CCTV Hub, UTP/Coax, 220-240V/24VAC

3. Installation Procedure

3.1. Parts List

The LongReach 16 comes with the following parts. Please verify that all pieces are present before proceeding.

- Base Unit (Factory configuration: rack mount)
- External Power Supply 24VAC, 60VA (Europe: 70VA)
- Rubber stand-offs
- Installation Guide

3.2. Product Overview

The external connections and diagnostics of LongReach 16 are detailed in the following diagrams. Please familiarize yourself with them before installing the unit.

Figure 1: Front panel, all models

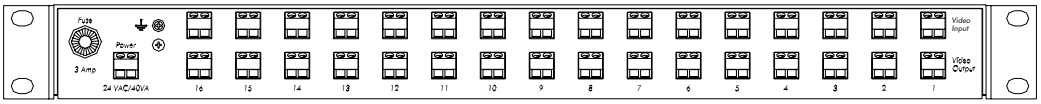

Figure 2: Rear panel, UTP/UTP version

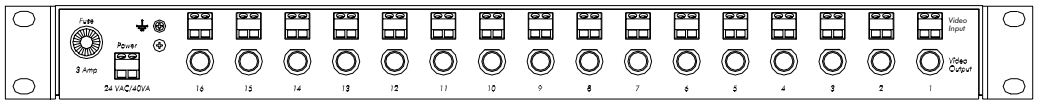

Figure 3: Rear panel: UTP/Coax version

3.3. Pre-Installation Checklist

Warning: Do not connect power supply to video signal or ground terminals. Unit can be damaged and warranty will be void.

The LongReach 16 provides a centralized sixteen (16) port CCTV copper twisted pair cabling solution.

1. The LongReach 16 is always connected to the receiver side of a CCTV installation. For example it is connected directly to the video input ports of a DVR, CCTV multiplexer or matrix switcher at the central monitoring location.

2. The LongReach 16 is used in conjunction with MuxLab's passive CCTV Baluns (p/n 500000, 500009, 500022, or 500023). The passive CCTV Baluns are connected at the CCTV source, which is usually the CCTV camera.

Please note that the LongReach 16 will also work with third party vendor baluns and CCTV cameras with built-in twisted pair baluns (balanced output). It may be necessary to reverse the polarity of the wires first. Distance performance may vary.

3. For best image quality and operator safety, the multiplexer or DVR should be properly grounded. If this is not possible, then the LongReach 16 should be properly grounded via the ground screw on the unit. Please ensure that there is a building ground available for this purpose.

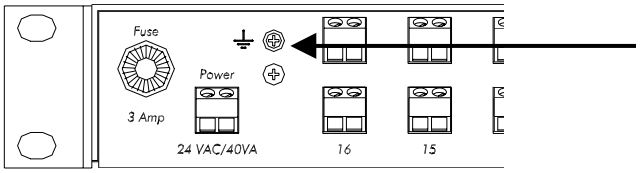

Figure 4: Ground lug

4. The LongReach 16 must be powered by a floating 24VAC, 40VA min power transformer.

5. The LongReach 16 is calibrated to work with CCTV sources that conform to RS-343 (RS-170).

3.4. Physical Installation

The LongReach 16 has three mounting options; desktop, 19" rackmount or wallmount. The product comes with **two (2) mounting brackets** and four (4) rubber stand-offs to allow it to be configured for either option. The product is factory set for rackmounting.

1. If the product is to be rackmounted in a relay rack, select the final destination for the product and install the unit using standard rackmount screws.

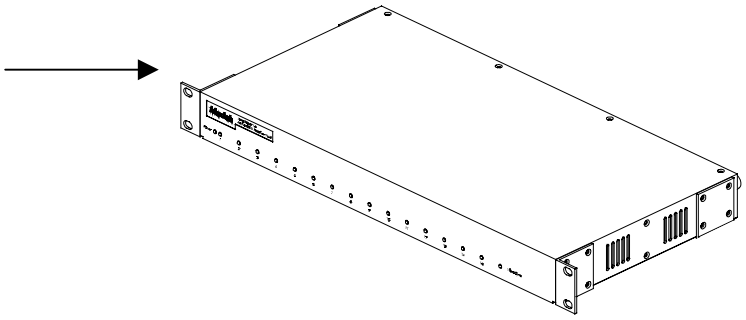

Figure 5: Rack-mount brackets

2. If the product is to be installed on a desk, then remove the rackmount brackets with a standard Philips screwdriver and store the brackets for future use. Peel the backing off the rubber standoffs and affix them to the corners underneath the base of the unit.

3. If the product is to be wallmounted, remove the rackmount brackets and install them in the wallmount position on the product as shown below.

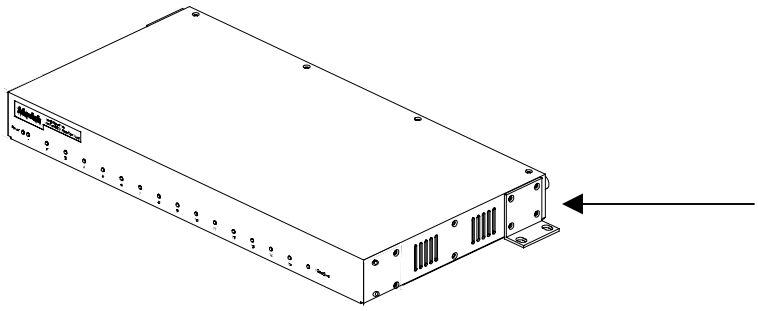

Figure 6: Wall-mount brackets

4. Install the product on the wall using the proper mounting hardware.

3.5. Installation Procedure – UTP/UTP Version

The LongReach 16 is available in two models; UTP/UTP (500120,500121) and UTP/Coax (50022, 500123). The 500120 allows the unit to be installed in a remote wiring location away from the central monitoring equipment. The LongReach may be installed up to 500 feet away from the DVR via Cat 5 UTP cable. In order to install the product in this configuration, please follow the steps below:

1. Install the LongReach 16 in its final location. Please verify that the distance between the hub and cameras and between the hub and DVR are within MuxLab specifications.

2. Connect a MuxLab passive CCTV Balun (MuxLab p/n 500000, 500009, 500022, 500023) to each CCTV camera video output port. Please refer to the CCTV Balun Installation Guide for details.

3. Connect one twisted pair from each camera to one port on the rear of the LongReach 16. Please ensure that straight-through polarity is respected between the CCTV balun and the hub. Multipair cables are supported as long as they are Category 5 or better.

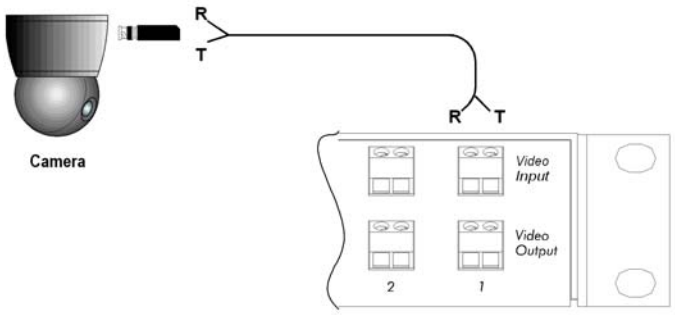

Figure 7: Camera connection

4. Ensure that the power is turned off on DVR or mux. Install a MuxLab passive CCTV balun on each port of the DVR. The 500009 is recommended for this purpose.

5. Connect one twisted pair from each LongReach 16 port to each balun on the rear of the DVR. Please ensure that straight-through polarity is respected between the LongReach 16 and the DVR. Multipair cables are supported as long as they are Category 5 or better.

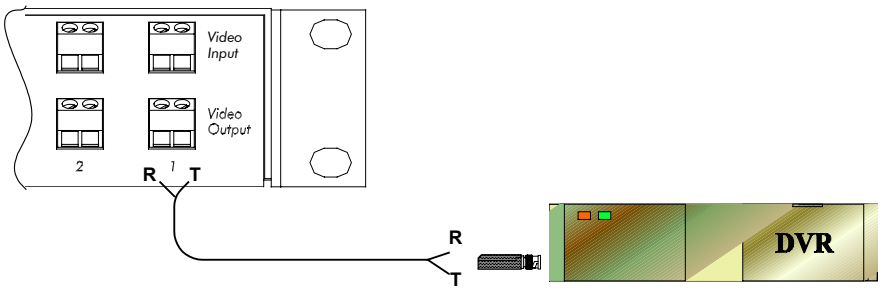

Figure 8: DVR connection, UTP/UTP version

6. Connect the floating 24VAC power transformer first to the hub and then plug the power supply into an AC power outlet. If power is present, then the green power LED will be ON.

7. Power on the CCTV cameras and DVR. When a video signal is detected, the green LED on each hub port will be ON.

8. Due to the Automatic Gain Control of the LongReach 16, the camera images may take a few seconds to stabilize. This is normal. The LongReach 16 automatically adjusts the brightness, sharpness and color to compensate for effects due to the cabling conditions. Use the adjustments on the CCTV camera, DVR or monitor to fine tune the final picture.

9. If there is visible low frequency background noise (wood grain pattern) in the picture, connect the ground lug of the LongReach 16 to a true building ground.

10. The following diagram shows the final configuration.

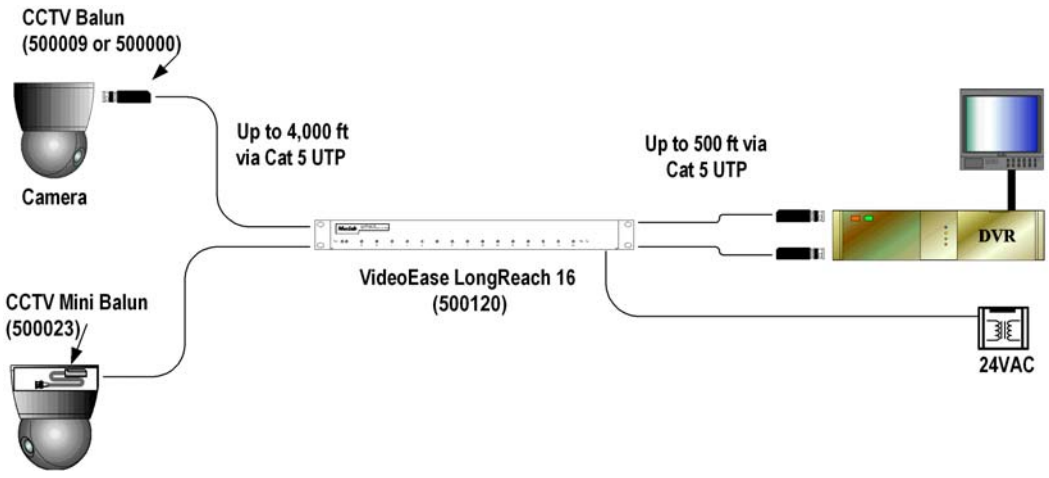

Figure 9: Typical Configuration, UTP/UTP version

3.6. Installation Procedure – UTP/Coax Version

The LongReach 16 is available in a UTP/Coax version (500122, 500123) where the hub is located near the central monitoring system (DVR). In order to install the product in this configuration, please follow the steps below:

1. Perform steps 1 to 3 listed in the previous section.

2. Ensure that the power is turned off on DVR or mux.

3. Connect one coax cable from each LongReach 16 port to each video input port on the rear of the DVR.

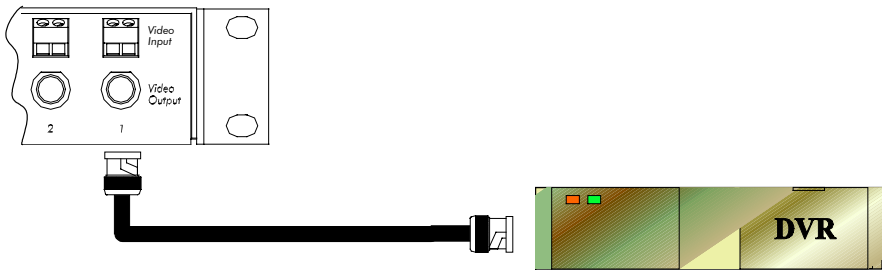

Figure 10: DVR connection, UTP/Coax version

4. Connect the floating 24VAC power transformer to the hub and plug the power supply into an AC power outlet. If power is present, then the green power LED will be ON.

5. Power on the CCTV cameras and DVR. When a video signal is detected, the green LED on each hub port will be ON.

6. Due to the Automatic Gain Control of the LongReach 16, the camera images may take a few seconds to stabilize. This is normal. The LongReach 16 automatically adjusts the brightness, sharpness and color to compensate for effects due to the cabling conditions. Use the adjustments on the CCTV camera, DVR or monitor to fine tune the final picture.

7. If there is visible low frequency background noise (wood grain pattern) in the picture, connect the ground lug of the LongReach 16 to a true building ground.

8. The following diagram shows the final configuration.

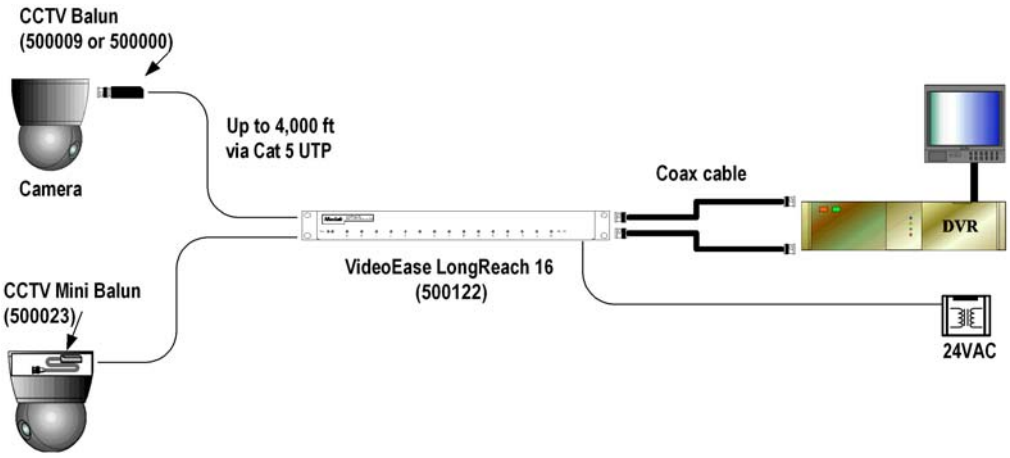

Figure 11: Typical Configuration, UTP/Coax version

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.

Picture	Power LED	Port LED	Probable Causes	Possible Solutions
No image	OFF		▪ Power off ▪ Blown fuse	▪ Check power supplies of CCTV equipment ▪ Remove the fuse at the rear of the unit and replace it with one with the same rating
No image	ON	ON	▪ Wrong pin configuration	▪ Check pin configuration and verify straight-thru wiring
Picture distorted	ON	ON or blinking	▪ EMI interference ▪ Wires reversed on signal pair on one side ▪ Split pair	▪ Check that wiring is not too close to transformers and lighting ballasts ▪ Make sure that the wires on the signal pair are not reversed on one side. ▪ Check if the UTP pairs are correct (not split)
Picture loses color	ON	ON	▪ Exceeded distance specifications ▪ Lower grade UTP cable is introducing high losses	▪ Check DC loop resistance and verify if distance spec is exceeded ▪ Reduce cable length or eliminate high-loss components ▪ Replace cable by higher grade
Picture contains low frequency background noise (wood grain pattern)	ON	ON	▪ Poor grounding	▪ Connect ground of Active Balun to true building ground
Image occasionally fading, synchronization not perfect	ON	ON	▪ Ground Loop Fault. i.e. ground differential voltage between transmit and receive ends exceeds 2 V DC or AC.	▪ Isolate remote camera power entry and enclosure from local ground. ▪ Ensure that camera is secured against static discharges (i.e.; is inside metal, grounded cage)

When contacting your nearest MuxLab dealer or MuxLab Technical Support please have the following information ready:

- Unit model number.
- Cabling lay-out. Include model of camera and DVR used, cable length and type.
- Description of problem.
- List of tests performed.

5. 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 a 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 AUTHORISED 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.

MuxLab

Tel.: (+1) 514 905-0588 Fax: (+1) 514 905-0589
Toll Free (North America): 877 689-5228

URL: www.muxlab.com
E-mail: videoease@muxlab.com