VideoEase™ Audio-Video Hub (500200)
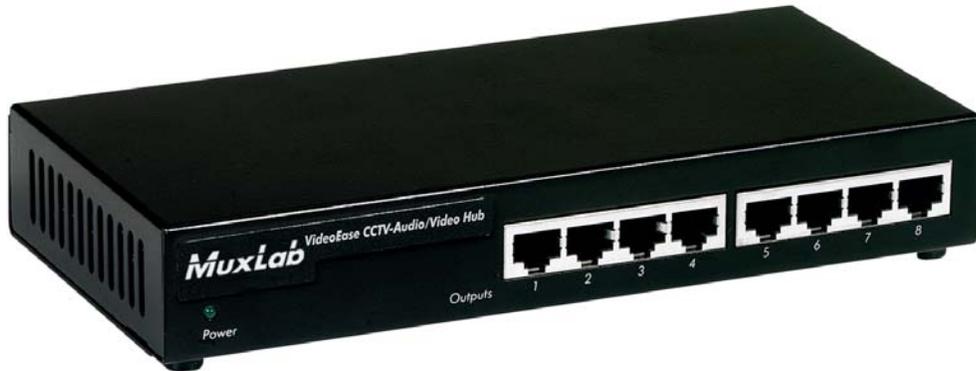
Installation Guide

MuxLab

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Table of Contents

1. Overview

1.1. Description

The VideoEase Audio-Video Hub allows up to two (2) baseband video signals and up to two (2) audio signals to be distributed to up to eight (8) destinations via twisted pair (UTP) cable for more cost-effective and versatile cabling.

The Audio-Video Hub when used in conjunction with MUXLAB's line of VideoEase baluns, allows coaxial cable to be eliminated between the Audio-Video source and the destinations. For example, the product works with the VideoEase CCTV Balun (500000, 500009), VideoEase Stereo Audio/Video Balun (500001),VideoEase Dual Audio/Video Balun (500012), S-Video Balun (500016) and S-Video/Audio Balun (500017).

The Audio-Video Hub allows CCTV and audio-video signals to be distributed to multiple locations via standard twisted pair cabling instead of costly coaxial video cable or audio cable.

A looping output allows the source input to be distributed to other baseband audio/video equipment including matrix switchers, multiplexers, VCRs and monitors and other VideoEase Audio-Video Hubs for greater versatility. The video and audio twisted pairs are independent of each other and it is not necessary to use all of them in a given application. The Audio-Video Hub is designed for point-to-point configurations and further expansion via cable tapping is not supported.

1.2 Applications, Benefits and Features

1.2.1. Applications

CCTV security and surveillance
Classroom audio/video instruction
Corporate audio/video presentations
Tradeshow demonstration systems

1.2.2. Benefits

Distribute CCTV and audio-video to multiple destinations via twisted pair
Eliminates costly and bulky coax cable
Centralised cabling for greater control
Quicker moves, adds and changes

1.2.3. Features

Supports NTSC and PAL
Up to 2200 feet between the source and destination via Cat 5 twisted pair in color..
Supports up to 2 video and 2 audio channels
Integrates seamlessly with MUXLAB VideoEase baluns
Looping output to cascade to other hubs or audio-video equipment
Rubber stand-offs for desktop placement
2-year warranty

2.
Technical Specifications

Specifications	
Environment	Close-Circuit TV (CCTV) equipment for security and surveillance; composite baseband audio/video (ie; NTSC, PAL); S-Video.
Devices	CCTV cameras, CCTV monitors, video switchers, video sequencers, multiplexers and other CCTV equipment. VCR, DVD, video-conferencing and other baseband audio/video equipment.
Transmission	Transparent to the user.
Source Impedance Req'ts	Video OUT: 75 ohms Audio OUT: 600 ohms max.
Destination Impedance Req.	Video IN: 75 ohms Audio IN: 600 ohms min.
Hub Impedance	Video IN: 100 ohm balanced Audio IN: 10 kohms min. balanced Video OUT: 100 ohms balanced Audio OUT: 600 ohm balanced
3 dB Bandwidth	Video: DC to 8 MHz. Audio:50 Hz to 16 kHz
Maximum Differential Input	Video: 0.55 Vp-p Audio: 0.50 Vp-p
Maximum Differential Output	Video: 0.55 Vp-p Audio: 0.50 Vp-p
Insertion Loss (differential)	Video: 0 dB max. @ 4 MHz Audio: 1 dB max. @ 1 kHz
Video Return Loss	24 dB minimum
Common Mode Rejection Input: balanced. Output: unbalanced	Video: Greater than 40 dB over the frequency range. Audio: Greater than 60 dB over the frequency range.
Crosstalk Immunity	60 dB minimum over the frequency range
Max. Distance via Cat 5 Twisted Pair (UTP) *	Composite Video Color: 2200 ft (670m) * Composite Video B&W: 2500 ft (762m) * S-Video: 1000 ft (305m) * *Measured between Source (ie;DVD) and Destination (ie;Monitor) with Hub placed anywhere between the source and destination*
Cable – UTP	24 gauge or lower solid copper twisted pair wire impedance: 100 ohms at 1 MHz. Cat 3 or better.
Connectors	Source Input: One (1) RJ45 jack on rear panel Looping Output: One (1) RJ45 jack on rear panel Distribution Outputs: Eight (8) RJ45 jack on front panel
RJ45 Pin Configuration *Reverse Polarity Sensitive*	Video 1: Ring 7 Tip 8 Audio 1: Ring 1 Tip 2 Video 2: Ring 4 Tip 5 Audio 2: Ring 3 Tip 6
Diagnostics	Power LED – Green
Power Supply	External AC: 110V and 220/240V DC: +/- 12VDC, 5W total max.
Power Supply Connector	5-pin DIN; pin 1 GND, pin 2 GND, pin 4 -12V, pin 5 +12V.
Temperature	Operating: 0 to 55 C. Storage:-20 to 85 C. Humidity: up to 95% non-condensing
Dimensions	8.5" x 4" x 1.3"
Compliance	FCC, CE-EMC Directive 89/336/EEC
Warranty	2 years
Order Information	500200 VideoEase Audio-Video 8-Port Active Hub, 110V 500201 VideoEase Audio-Video 8-Port Active Hub, 220/240V

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3.
Installation Procedure

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3.1.   Installation

Follow the steps listed below to install the Audio-Video Hub :

1.   The Audio-Video Hub is polarity sensitive and works in conjunction with MUXLAB's VideoEase video baluns. If the Audio-Video Hub is used with baluns which have a signal polarity opposite to that of the Audio-Video Hub, then the signal polarity of the cabling between the hub and the video baluns may need to be reversed. Verify that the pin configuration of the video baluns match the pin configuration of the hub. The pin configuration of the hub is conveniently located on the rear panel.

Pin Configuration Table

2.   Connect the appropriate MUXLAB video baluns to the audio-video source and destinations. The Audio-Video Hub supports up to two video and two audio channels. Therefore, the Audio-Video Hub will work in conjunction with the CCTV Balun, Stereo Audio/Video Balun and 2-Way Audio/Video Balun. Prepare the appropriate line cords to connect the baluns to the twisted pair cabling system in the building.

3.   Place the Audio-Video Hub in its final location.

Before connecting the cables keep the maximum cable lengths in mind. The final location for the Audio-Video Hub must be within maximum distance specs of the controller and of each terminal (see Specifications section). These distances assume that the cable used conforms to the cable requirements given in the Technical Specification section of this guide. Note that every connection is equivalent to 10' of cable and must be included in the maximum cable length calculation. If you are not sure of your cable length it can be estimated by performing a DC resistance test with a digital ohm meter. 1000

feet of 24 AWG cable should give a reading of approximately 26 ohms (52 ohms if you are measuring at one end with the opposite cable ends shorted).
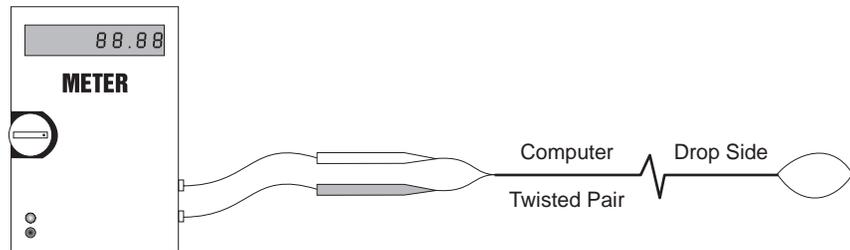

Figure 1 : Measuring Cable Impedance

The Audio-Video Hub must be kept away from sources of radio-frequency or electromagnetic radiation :

a)   5" from power lines of 2 kVA or less.

b)   12" from fluorescent lighting & power lines between 2 & 5 kVA.

c)   36" from power lines greater than 5 kVA.

d)   40" from transformers & motors.

Best performances will be achieved using home-run cable. Do not use flat cable (i.e., cable that is not twisted), even for patching with short runs. Flat cable acts as an antenna and will pick up nearby radio-frequency interference.

4.   Identify the pin configuration of both the video balun and the Audio-Video Hub. For example, when using the VideoEase Stereo Audio-Video Balun (500001), the modular cable must use straight through polarity.

Model →	500000	500001	500012	500016	500017
Signal	CCTV Balun	Stereo Audio-Video Balun	Dual Audio-Video Balun	S-Video Balun	S-Video/Audio Balun
Video 1	7&8	7&8	7&8	7&8 luma	7&8 luma
Video 2	N/A	N/A	4&5	4&5 chroma	4&5 chroma
Audio 1	N/A	1&2	1&2		1&2
Audio 2	N/A	3&6	3&6		3&6

Figure 2 : MUXLAB Video Balun Pin Configurations
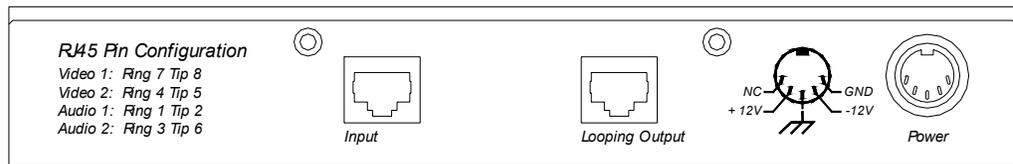
Figure 3 : Audio-Video Hub Back Panel
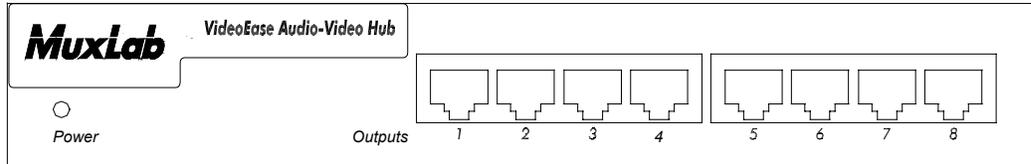
Figure 4 : Audio-Video Hub Front Panel

Straight polarity   Reverse polarity
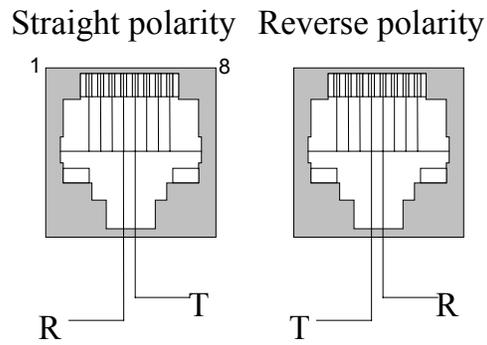
5.   Plug the Audio-Video Hub into the nearest AC power outlet. The Power LED should light up and stay on.

VideoEase 2-Way
Audio/Video Balun
(500012)

Audio1
Video 1
Audio 2
Video 2

Cat 5 Twisted Pair
(4-Pair)

RJ45
8-pin modular plug

RJ45 Pin Configuration
Video 1: Rng 7 Tip 8
Video 2: Rng 4 Tip 5
Audio 1: Rng 1 Tip 2
Audio 2: Rng 3 Tip 6

Input

Looping Output

NC — GND
+ 12V — -12V

Power

MuxLab   VideoEase Audio-Video Hub

Power

Outputs   1   2   3   4   5   6   7   8
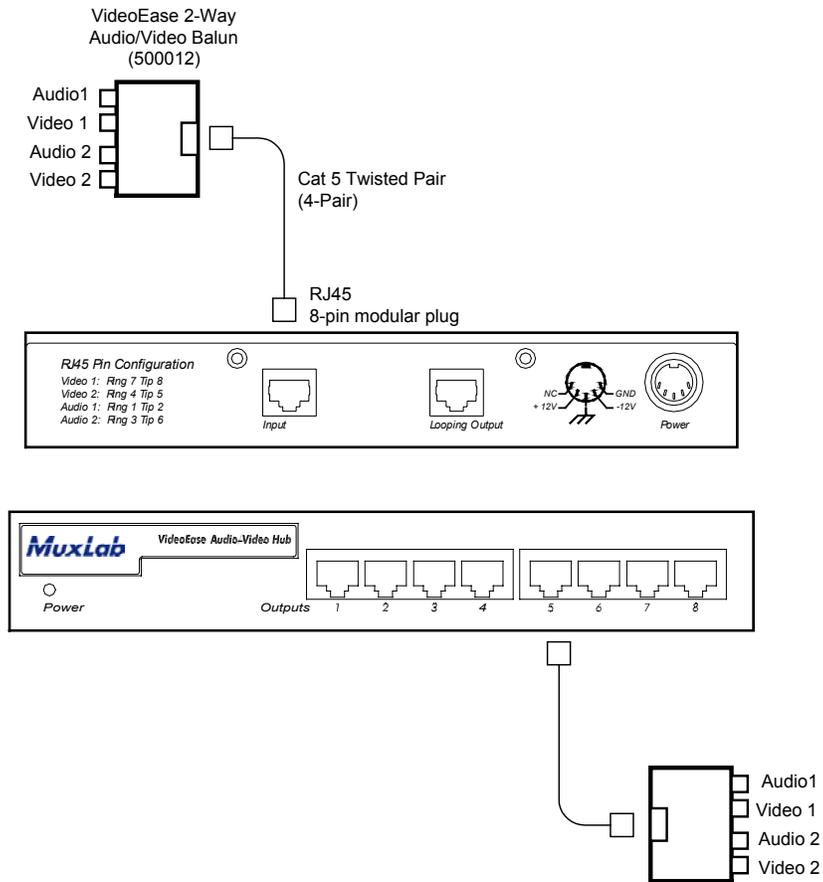
Audio1
Video 1
Audio 2
Video 2

Figure 5 : Connection Diagram

6.   Connect the cable coming from the audio-video source to the Input located on the back of the Audio-Video Hub.

7.   Connect, one at a time, the twisted pair cables coming from the audio-video destinations into the front-panel ports. Power on the source and destination equipment and send an audio/video signal from the source.   Verify the presence and quality of the audio and video.
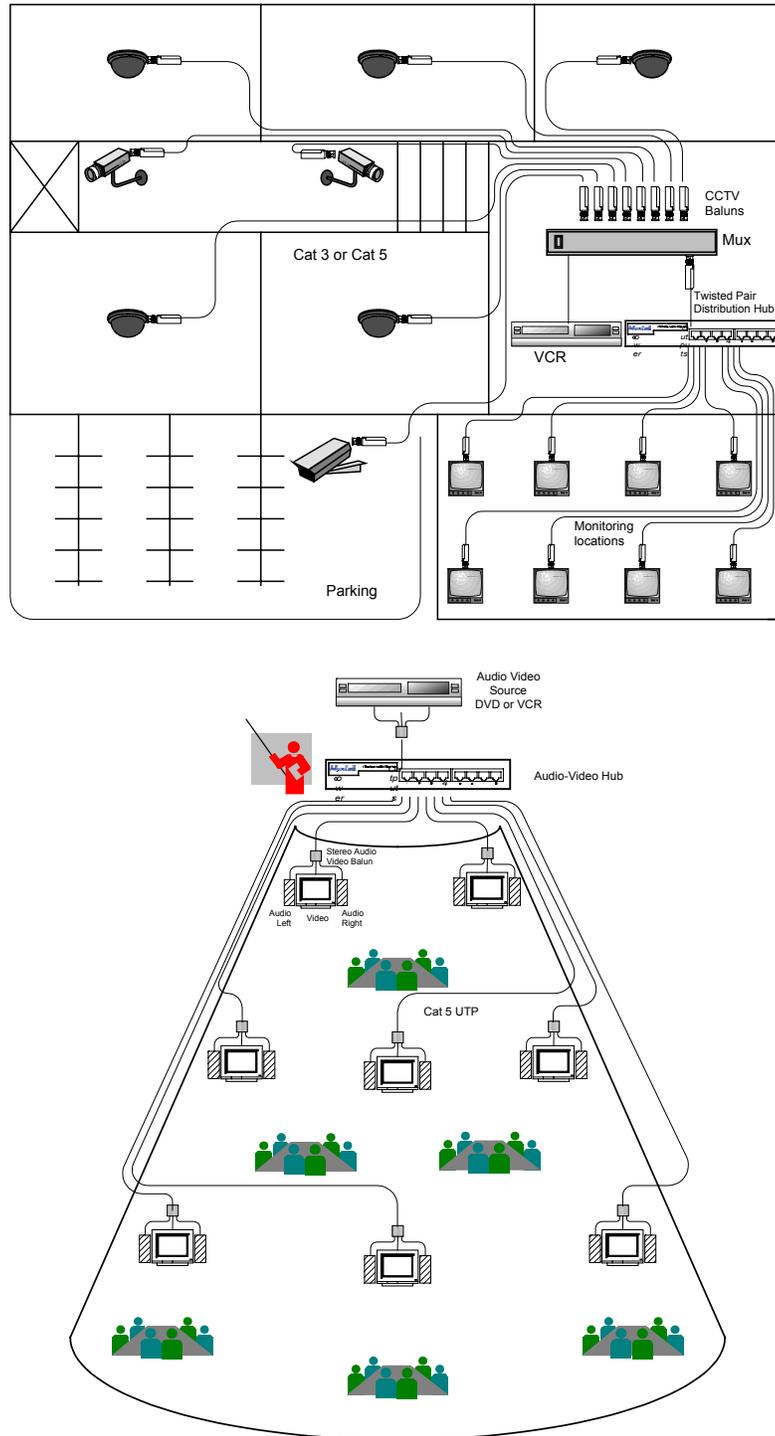
3.2. Typical Applications

Figure 6 : Typical Installations

3.3.   Cascading Multiple Hubs

The Audio-Video Hub may be cascaded with another hub in order to distribute a base-band audio video source to more than eight destinations.   The following picture shows the location of the Looping Output.


Looping Output

For example an audio video presentation from a VCR or DVD source may be distributed to multiple classrooms via pre-installed Cat 5 twisted pair cable. Due to the active electronics in the hub, the number of hubs that may be cascaded is eight (8).
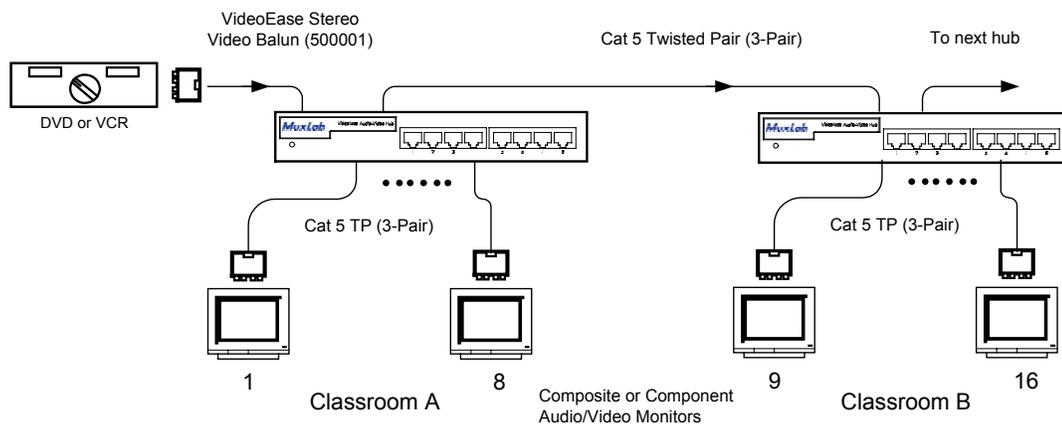
In order to cascade the first hub to a second hub, prepare a 4-pair Cat 5 cable from the Looping Output of the first hub to the Input Port of the second hub.   The cable must be configured as straight-thru and terminated with RJ45 modular plugs on either end.

Note: The Distribution Ports and Looping Outputs do not amplify the signal.   The maximum distance from the source to the most distant hub or monitor may be up to 2500 feet depending on the type of audio-video signal being transmitted.   The use of cross-connect blocks and patch panels is also supported. Each cross-connect results in an effective loss of distance of 5 to 10 feet. When splicing connections onto a cross-connect block, please ensure that the individual wires remain twisted right up within 0.5" of the cross-connect.

Another way of expanding the audio/video distribution network is to cascade the hubs in a tree topology. Each of the nine outputs is identical and any of these ports may be connected to the Input Port of another hub. In the example below, nine hubs may be used to distribute an audio-video program to up to 64 audio-video monitors in a classroom or corporate training environment.
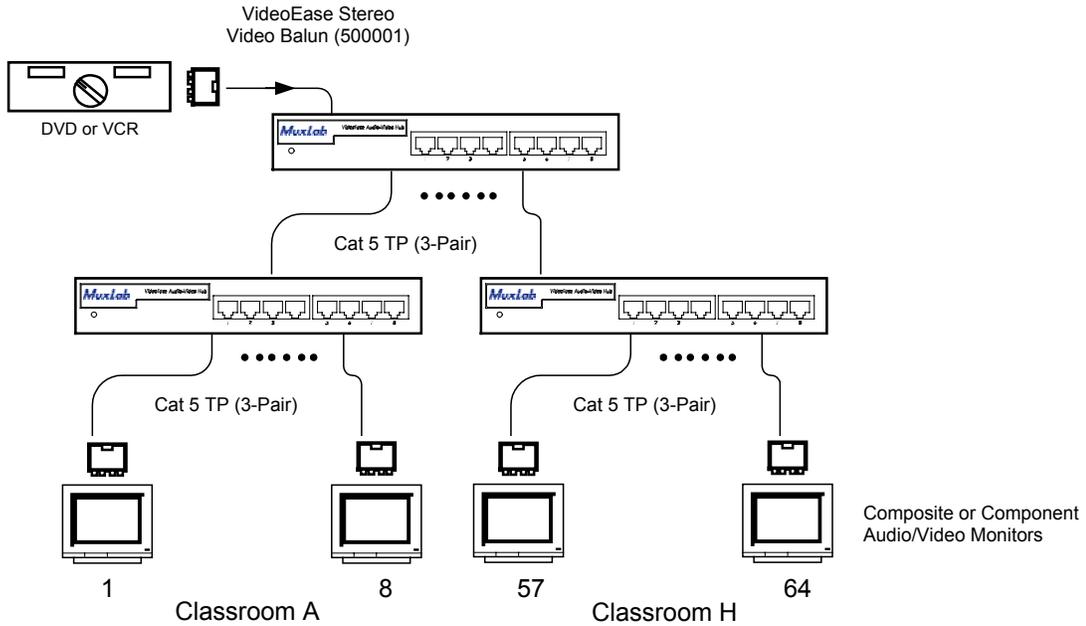
4.
Troubleshooting

Reading this section carefully will surely allow you to pinpoint and resolve any type of malfunction. If after going through this section your problems still cannot be resolved, then refer to section 4.2 for additional assistance.

4.1.   Symptoms, Causes and Possible Solutions

The following section describes some of the symptoms that may arise during an installation, as well as the possible causes and solutions.

Symptom: The Power LED does not come on
Cause: No power received by unit.
Solutions: Make sure that the power cord is connected to the Hub.
     Verify that there is in fact AC at the wall plate by plugging in another working AC-powered device.

Symptom: No video or audio image.
Causes: Open wiring path
     Split or crossed twisted pairs
Solutions: Verify wiring continuity via a simple ohmmeter
     Check for split twisted pairs
     Check that pin configuration of Hub matches video baluns.

Symptom: Distorted video image
Causes: Reverse signal polarity
Solutions: Verify that polarity is straight through on each audio-video channel.
     Verify that pin configuration of the video baluns matches the Hub.
     Verify that the the twisted pairs are fully twisted up to the connection points.

Symptom: Picture is clear but there is a loss of color.
Cause: Excessive signal loss
Solution: Check the effective length of the cable via an ohmmeter and ensure that distance specifications have not been exceeded.
     Check for possible signal losses due to poor connections.

If, after going through this Troubleshooting chapter, you fail to resolve your problem and require more help, please call:

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MuxLab Technical Support
(514) 905-0588 or toll free 1-877-689-5228 (North America)
Visit our web site at www.muxlab.com

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4.2.   Technical Support Information

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

1. Baluns used. Model and part number.

2. Hub serial number.

3. Environment layout. Include audio-video source and destination equipment used, estimated cable lengths and type of cable used (UTP, STP, 25 pair, 50 pair or 100 pair).

4. Problem description.

5. List of tests performed.

5.
Manufacturer's Limited Warranty

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 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.

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In order to validate your warranty and obtain follow-up information and updates on the MuxLab Product line, please fill out the Warranty Registration card enclosed and mail it as soon as possible.

Notes

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