

VideoEase MonoPro™ XLR

Application Guide

Version 1.01

MuxLab

Jan 2006

Purpose

The purpose of this document is to explain how to apply MuxLab's MonoPro XLR in different operating scenarios and to discuss issues not covered in the Installation Guide that comes with the product.

Function of the MonoPro XLR

The function of the MonoPro XLR is to provide a cost-efficient and user-friendly method of connecting pro-audio equipment via Cat5 twisted pair cable in a point-to-point connection. Traditionally, pro-audio users have avoided the use of Category 5 cable because of concern about the integrity of the connections. The MonoPro XLR has been designed to alleviate these concerns by providing a secure and reliable connection point for Cat5 cable.

Equipment Supported

Used in pairs, the MonoPro XLR works with any professional audio-video equipment that supports AES balanced analog or digital audio. The list includes equipment such as the following:

Audio Amplifiers

Audio Mixing Consoles

Mixer-Amplifiers

Passive microphones

Active microphones

Microphone Pre-amplifiers

Amplified speakers

Digital Audio Rate Converters

Analog/Digital Audio Converters

Digital Audio Recorders (DAT)

CD and DVD players

Equalizers

Signal processors

Typical Applications

The MonoPro XLR may be used to establish a variety of point-to-point connections via Cat5 twisted pair. The following diagrams illustrate several configurations that have been tested in MuxLab's laboratory.

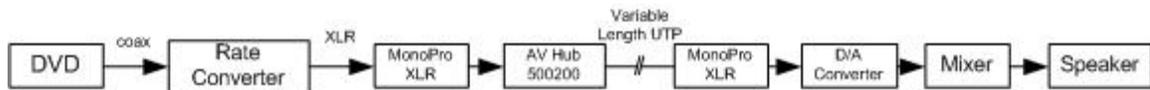
Mixer to Active Speaker

The following setup tested the balun in stereo analog audio mode. Qualitatively, the sound characteristics were excellent up to 5,000 ft. Over 5,250 ft, the sound started to have noticeable high frequency attenuation.



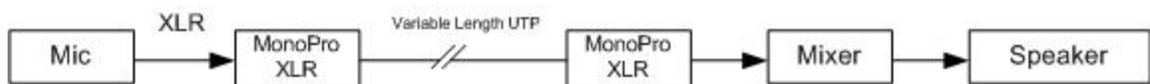
Audio Distribution

The following setup tested the compatibility of the balun with MuxLab's Audio-Video Hub (500200) in professional digital audio mode. Qualitatively, the sound quality was clear up to 1,000 ft.



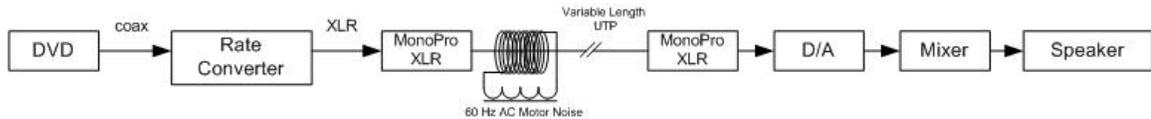
Microphone (MIC input, no phantom) to Mixer

The following setup tested the balun in mono analog audio mode for use with a microphone. Qualitatively, the sound was good up to 3,000 ft. Above 3,000 ft, the sound quality was reduced significantly.



Digital Audio to Mixer via Rate Converter and D/A

The following setup tested the balun in professional digital audio mode. Note that part of the UTP cable was wound around a running 60 Hz AC motor to simulate an AC noise source superposed on the signal. Quantitatively, the maximum distance varied according to the sampling rate of the rate converter.



Terminating the Cat5 Cable Inside the MonoPro XLR

The following photos show a close-up of the internal wiring connection of the MonoPro XLR.

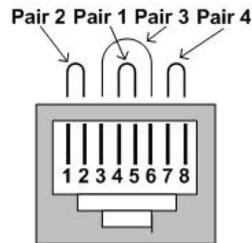


When is the Ground Terminal Needed

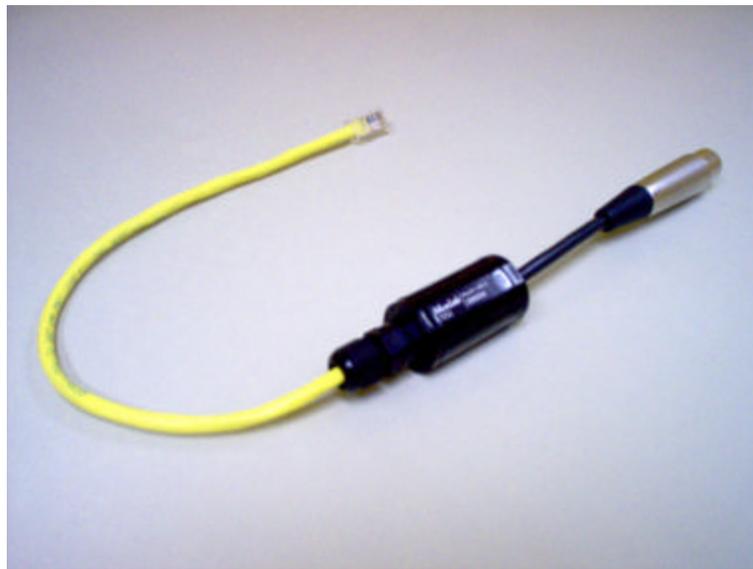
Since the audio signal is transmitted as a balanced signal via twisted pair, the ground terminal is normally not needed. However, if the MonoPro XLR is used in an application that requires 48VDC phantom power (48VDC), then the ground terminal is needed since phantom power is transmitted with reference to ground. In regard to safety, this is not an issue since phantom power is well protected against erroneous connections.

Adding a Cat5 line cord to the balun

In applications where the MonoPro XLR must be connected to a modular RJ45 wall outlet, a line cord may be added for increased versatility. In order to conform to structured cabling standards, it is recommended to terminate the twisted pair according to TIA 568 standard as shown in the diagram below and to use stranded Cat5 UTP and a stranded RJ45 plug.



The following photo shows the MonoPro XLR that has been prepared with an RJ45 line cord.



Use In Conjunction With Analog Audio Balun (500019)

The MonoPro XLR also works in conjunction with the 500025 at the source and the 500019 at the receiver. For example, in a building paging system, there may be a central audio distribution amplifier with pro-audio balanced (XLR) outputs that needs to connect to remote audio amplifiers with line-level (RCA) inputs in another location via Cat5 cable.

However, it is important to note that the nominal professional audio signal is +4dBu and that unbalanced line level audio is typically -10dBu. For example, if one connects the 500025 to the 500019 via 10 feet of Cat5, the signal level will be too high.

The risks are:

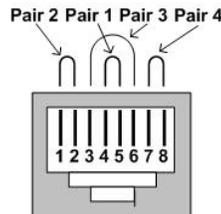
- a) the signal may be distorted (s/n ratio)
- b) there will be poor frequency response or
- c) there may be possible damage to the receiver.

In order to ensure reliable operation, the following precautions should be taken:

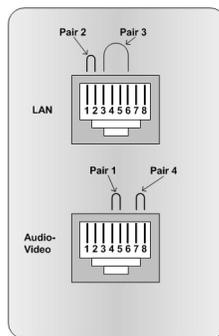
- a) Ensure straight-through polarity between the 500025 and 500019.
- b) Ensure that the signal level at the XLR output is not too high and corresponds to -10dBu at the receiver either by calculating the signal loss due to the cable and/or adjusting the volume controls.

Using Spare Twisted Pairs from a LAN Connection

In some installations where a point-to-point audio-video connection is needed and it is not practical to add twisted pair cable, there is the possibility of using spare twisted pair cable that is behind the wall. For example if an Ethernet 10/100 LAN is installed and there is a LAN outlet connecting two rooms between a PC and a LAN hub, it may be possible to use the unused twisted pairs from this connection. Ethernet 10/100 requires two (2) twisted pairs. These twisted pairs must be terminated on pins 1&2, 3&6 of the RJ45 jack. Assuming a four-pair Cat 5 cable was installed between the PC and the hub, there may be two unused twisted pairs available behind the wall if they have not already been used for other services.



Assuming the spare pairs are available, the two spare twisted pairs could be diverted to a second and/or third RJ45 outlet at both ends. This would allow up to two audio-video channels to be transmitted via Cat5 between the two locations. The following diagram shows how the two spare twisted pairs could be used to transmit stereo-audio or composite video and monaural audio from one room to another.



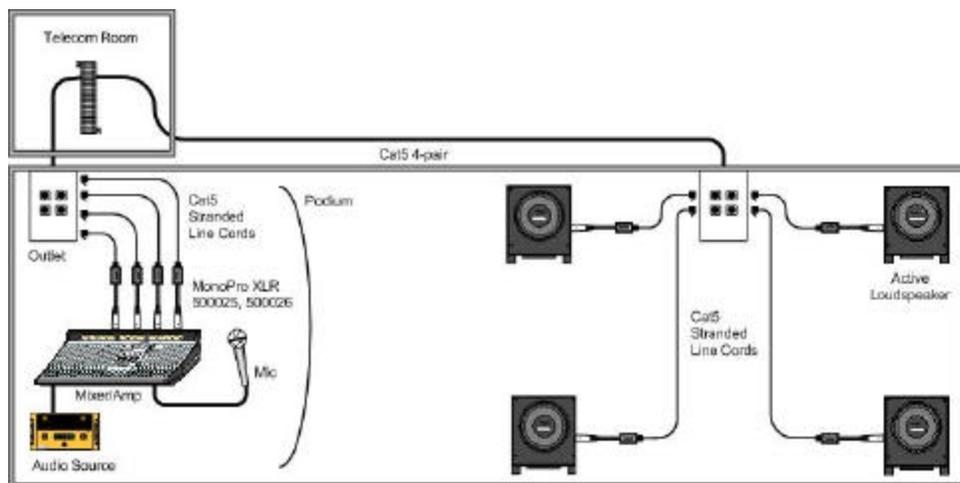
In regard to crosstalk, there will be no interference between the audio-video signal and the LAN signal under the same Cat5 cable jacket.

Rental and Staging Installations

In applications such as rental and staging, it is often desirable or necessary to use pre-existing Cat5 cable, the MonoPro XLR is a cost-efficient method for accessing the structured cabling system.

For example an audio source may be situated at one end of a hall and a cluster of active loudspeakers are at the opposite end, the loudspeakers may be connected to the audio source via a local telecom room and modular outlets. A single home run Cat5 cable will support up to four (4) audio connections. By breaking out the cable to four individual modular jacks, up to four loudspeakers can share the same Cat5 cable.

Adding a Cat5 stranded UTP cable to each MonoPro XLR and plugging the final assembly into the wall outlet makes the connections between the equipment simpler as shown in the following diagram.



Conclusion

Should you require additional information, please contact MuxLab Customer Technical Support for assistance or visit MuxLab's website at www.muxlab.com.

MuxLab Inc.
8114 Trans Canada Hwy
St. Laurent (Quebec)
Canada H4S 1M5

Telephone :514-905-0588
Toll-free (North America) : 1-877-689-5228
Fax :514-905-0589
E-mail: videoease@muxlab.com
URL: www.muxlab.com