

Active CCTV Receiver Balun 500015



Installation Guide

P/N: 94-000304-C SE-000266-C

MuxLab

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1. Overview

1.1. Description

The Active CCTV Receiver Balun (Active Balun) allows CCTV video signals to be transmitted up to 1 mile (1.6 km) via a Category 5E/6 twisted pair cable when used in conjunction with MuxLab's passive CCTV Balun (500000 or 500009) at the camera end. The Active Balun features Automatic Gain Control (AGC) and Ground Loop Blocking (GLB) for reliable and stable image quality. Once installed, no adjustments to the Active Balun are needed.

The Active Balun 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. Once installed, there is no further need to go on-site to check the video signal. Any further enhancements to the image may be made at the camera, monitor, multiplexer or DVR. The product requires a 24V, 2W AC power supply (not included) and connects directly to the video multiplexer or switcher. It features screw terminals with built-in strain relief for ease of installation.

1.2. Features

- Plug-and-Play: DDC1/DDC2 compliant
- Up to 1 mile via Cat 5E/6 UTP with passive CCTV Balun at camera
- Automatic Gain Control for brightness, sharpness and color
- Ground Loop Blocking
- Surge suppression
- Auto-resetting fuse
- Diagnostic LEDs
- Connects directly to CCTV receiver equipment
- Works with passive CCTV Baluns (500000 & 500009)
- Requires floating 24V, 2W AC power supply (not included)
- 1 year warranty

2.

Technical Specifications

Environment	CCTV equipment for security and surveillance. RS-343 (RS-170)
Devices	CCTV cameras , monitors, DVR, switchers, multiplexers and other CCTV equipment.
Transmission	Transparent to the user
Bandwidth	DC to 4.5 MHz
Input	1.5 Vp-p max, 100 ohms, balanced
Output	1.1 Vp-p, ± 1 dB, 75 ohms, unbalanced
Insertion Loss	Determined by Automatic Gain Control. Luma: -14 dB minimum Chroma: -60 dB minimum
Return Loss	Greater than 15 dB over the frequency range
Common Mode Rejection Ratio (CMRR)	Greater than 40 dB at 3.85 MHz
Maximum Distance Color or Black & White	Category 5E/6 UTP/STP: 1 mile (1.6 km)
LED Indicators	Green (Dim): Power Green (Bright): Video Signal and AC power Red: Ground Loop Fault
Cable: Cat 5E/6 UTP/STP	24 gauge or lower solid copper twisted pair wire Impedance: 100 ohms at 1 MHz Maximum capacitance: 20 pf/ft Attenuation: 6.6 dB/1,000 ft at 1 MHz
Cable: BNC	Impedance: 5 ohms at 1 MHz (RG59/U or RG6)
Input Connectors	Video: Two (2) screw terminals; <i>reverse polarity sensitive</i> Power: Two (2) screw terminals Ground: One (1) screw terminal
Output Connector	Video: Male BNC with 5" coax lead
Power	24V (AC or DC) floating $\pm 20\%$, 110 mA RMS typical, 3W RMS max.
Video IN/OUT Surge protection	± 1.5 V max permanent voltage positive or negative pulse, 3V max. 1 ms
AC/DC power surge protection	Above 30 VAC RMS or 42 VDC
Built-In Fuse Protection	Auto-resetting upon power off. Not user serviceable.
Temperature	Operating: 0° to 45°C Humidity: Up to 95% non-condensing Storage: -20° to 85°C
Enclosure	Fire retardant plastic (black) Dimensions: 2.40" x 2.25" x 1.00" plus 5" coax lead
Mounting	Velcro pad for optional surface mounting
Regulatory	FCC, CE
Warranty	1 year
Order Information	500015 Active CCTV Receiver Balun

3. Installation Procedure

3.1. 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 Active CCTV Receiver Balun is used to provide extended distance via a copper twisted pair. Before installing the product, please verify the following checklist to ensure that installation takes place smoothly.

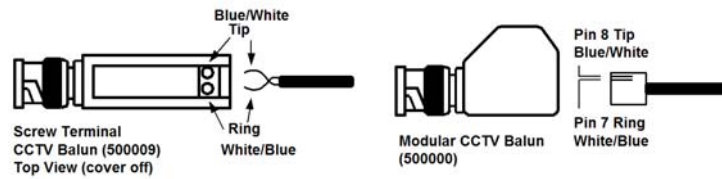
1. The Active Balun is always connected to the receiver side of a CCTV installation. For example, it is connected directly to the video input ports of the CCTV multiplexer, DVR or matrix switcher at the central monitoring location.
2. The Active Balun is used in conjunction with MuxLab's passive CCTV Balun (500009 or 500000). The passive CCTV Balun is connected at the CCTV source, which is usually the CCTV camera.
3. For best image quality and operator safety, the multiplexer or DVR should be properly grounded. If this is not possible, then the Active CCTV Balun should be properly grounded. Please ensure that there is a building ground available. Note: If more

than one Active Balun is connected to the same multiplexer, only one balun needs to be properly grounded.

4. The Active Balun must be powered by a 24V, 2W AC power supply (not supplied with the product).
5. The Active Balun is calibrated to work with CCTV sources that conform to RS-343 (RS-170).

3.2. Installation Procedure

1. Connect the passive CCTV Balun (500000 or 500009) to the CCTV camera video output port.
2. Connect one twisted pair to the passive CCTV Balun. If the balun is the 500009, use a small flat-head screwdriver. If the balun is the 500000, crimp an RJ45 modular plug to the end of the cable, ensuring that Pins 7 & 8 of the RJ45 are connected to a twisted pair.



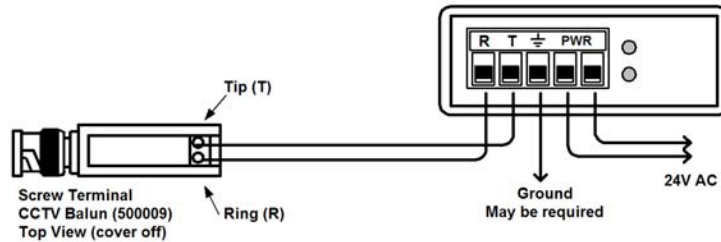
3. Identify the screw terminals on the Active Balun.

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4. Ensure that the power is off on the CCTV multiplexer or DVR. Connect the Active Balun to the appropriate video input port.
5. Connect the two power wires from the 24 VAC supply. If power is present, then the green LED will be ON and dim. Multiple Active CCTV Baluns may be powered from the one 24 VAC power supply. Consult the power rating of the Active Balun in the Technical Specifications Section on page 6 to

determine how many units may be powered from one supply.

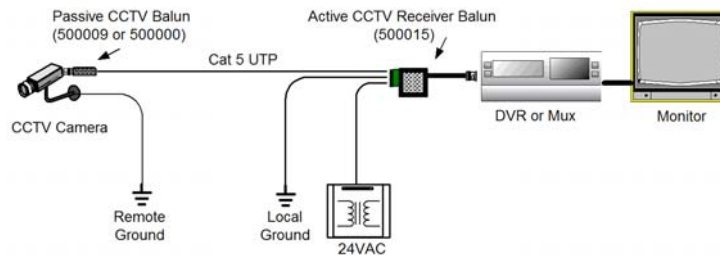
6. Using a small flat-head screwdriver, connect one twisted pair for video. Please note that the baluns are polarity sensitive. Connect Ring (R) to Ring (R) and Tip (T) to Tip (T) as indicated by the label on each balun.



7. Power on the CCTV system. When a video signal is detected, the green LED on the Active Balun will change from dim to bright.
8. Due to the Automatic Gain Control of the Active Balun, the camera image may take a few seconds to stabilize. This is normal. The Active Balun automatically restores the video camera signal to its original quality, compensating for effects due to the presence of a UTP cable and electrical noise. Use the monitor's standard controls to fine tune the final picture.
9. If there is visible low frequency background noise (wood grain pattern) in the picture, connect the ground wire of the Active Balun to a true building ground.
10. If there is a severe ground loop problem in which the voltage differential between the camera and the

Active Balun exceeds 1.5 VDC, the red LED will light up. If this occurs and there is image distortion, correct the problem by installing additional ground loop blocking equipment or eliminating the voltage differential. If there is no image distortion, the Active Balun will continue to function normally and there is no need to take corrective action.

11. The following diagram illustrates a typical configuration.



12. The Active Balun is equipped with resettable fuses to protect the circuitry. In the event of a power surge, the fuse(s) will trip and the green LED will dim. In order for the fuse(s) to reset, the power to the Active Balun must be turned OFF for 2-3 minutes. The fuse(s) will then reset and the power can be turned on again.

4. Troubleshooting

The following table describes some of problem symptoms, 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	Green LED	Red LED	Probable Cause	Possible Solutions
No image	OFF	OFF	• Power off	• Check power supplies of CCTV equipment.
	Dim	OFF	• Wrong pin configuration	• Check pin configuration and verify straight-thru wiring.
	Dim	OFF	• Fuse tripped due to power surge	• Turn power off. Wait 2-3 minutes. Turn power on. Investigate cause of power surge.
Picture distorted	Bright or blinking	OFF	• 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	Bright	OFF	• 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 one of higher grade.
Picture contains low frequency background noise (wood grain pattern)	Bright	OFF	• Poor grounding	• Connect ground of Active Balun to true building ground.
Image occasionally fading, synchronization not perfect	Bright	ON or blinking	• Ground Loop Fault (ground differential voltage between transmit & receive ends exceeds 2 VDC or AC)	• Isolate remote camera power entry and enclosure from local ground. • Ensure that camera is secured against static discharges (<i>i.e.</i> , is inside a metal, grounded cage).

4.1. Technical Support Information

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

- Unit model number
- Cabling layout. Include camera and multiplexer/DVR used (with model numbers), estimated cable lengths (between the equipment), and type of cable used (UTP, STP, 4-pair, multipair, category)
- 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 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 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.

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