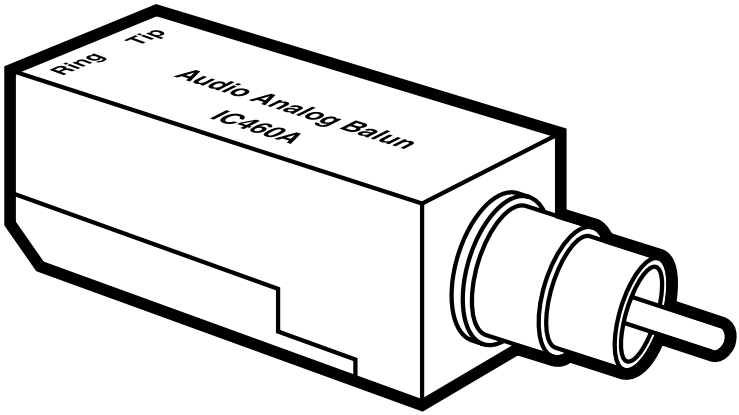
JUNE 2004
IC460A

Audio Analog Balun



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: **www.blackbox.com** • E-mail: **info@blackbox.com**

FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

TRADEMARKS USED IN THIS MANUAL

Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

1. Specifications

Electrical Signal Type: Unbalanced analog mono or stereo audio

Compatible Devices: DVDs, VCRs, camcorders, audio mixers, audio matrix switchers, audio splitters, audio distribution amplifiers, boosters, Hi-Fi, microphones, home theaters, and other commercial or consumer analog equipment

Transmission: Transparent to the user

Maximum Input: 1.1 Vp-p (+20 dBu, unbalanced <1% THD)

Insertion Loss: Less than 1 dB per balun pair over the frequency range

Common Mode Rejection (CMMR): Greater than 60 dB @ 1 kHz

Audio Source Impedance: 100 to 600

Audio Receiver Impedance: 10 k to 100 k

Impedance Transformation Ratio: Single unit: 4:1 (source:line)

Cable: UTP: 24 gauge or lower solid copper twisted-pair wire impedance:
100 ohms at 1 MHz;
Maximum capacitance: 20 pF/ft.;
Attenuation: 6.6 dB/1000 ft. at 1 MHz

Maximum Distance: Up to 1000 ft. (304.8 m) @ 60 Hz to 20 kHz;
1000 to 5000 ft. (304.8 to 1524.4 m)@ 100 Hz to 20 kHz

Connectors: (1) RCA male connector, (2) screw terminals*

*Phase error sensitive. Ensure straight-through polarity in stereo audio applications.

Temperature Tolerance: Operating: 32 to 131°F (0 to 55°C); Storage: -4 to +185°F (-20 to +85°C)

Humidity: Up to 95%, noncondensing

Enclosure: Fire-retardant plastic

Size: 1.3"H x 0.5"W x 0.5"D (3.3 x 1.3 x 1.3 cm)

Weight: 1.5 oz. (42.5 g)

2. Overview

Connect DVDs, VCRs, camcorders, audio mixers, audio matrix switches, audio splitters, audio distribution amplifiers, boosters, Hi-Fi, microphones, and home theaters together using unshielded twisted-pair cable (UTP) instead of costly and bulky coaxial cable. The Audio Analog Balun allows the unbalanced analog audio signals produced by these consumer or commerical audio devices to be transmitted via a single unshielded twisted-pair (UTP) cable.

Used in pairs, the Audio Analog Balun uses standard premise wiring techniques to connect your audio equipment. One or two pairs of baluns is required depending on whether the application is for monaural or stereo audio. The Audio Analog Balun provides built-in cable strain relief for easy installation and reliable connectivity.

3. Installation

To install the Audio Analog Baluns, follow these steps:

1. Depending on the number of audio signals to be transmitted, use one pair of baluns for each audio signal. For example, for mono audio, use two baluns; for stereo audio, use four baluns.

2. The Audio Analog Balun is compact enough to allow multiple baluns to be mounted adjacent to one another on the back of any piece of audio equipment, eliminating the need for RCA jumper cables. See Figure 3-1.

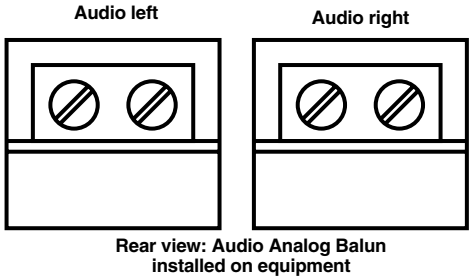


Figure 3-1. Install the baluns on audio equipment.

3. Identify the balun's pin configuration (the screw terminal's pins are labeled Tip and Ring). One twisted pair is required for each balun connection. The Audio Analog Balun is polarity sensitive. Therefore, in stereo audio applications, for full stereo audio quality, ensure straight-through polarity as shown in Figure 3-2.

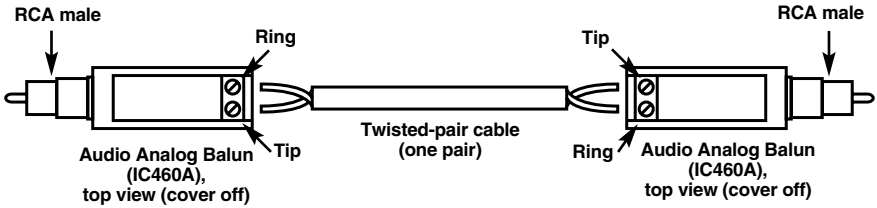


Figure 3-2. Straight-through polarity.

4. The Audio Analog Baluns work in pairs. Plug one balun into the audio source's RCA connector. If stereo audio is being transmitted, connect one balun to audio left and one balun to audio right at the source end as shown in Figure 3-3.

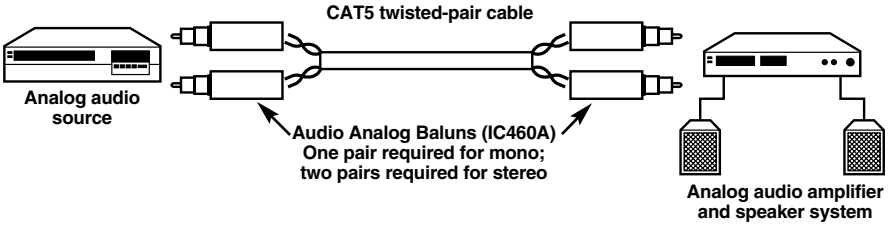


Figure 3-3. Mono and stereo audio applications.

5. Plug the second Audio Analog Balun into the audio receiver equipment's RCA connector at the remote end. If stereo audio is being transmitted, connect one balun to audio left and one balun to audio right at the remote end as shown in Figure 3-3.

6. Complete the connection between the two baluns, using standard UTP cable, connector blocks, and modular wall outlets.

7. Power on the audio equipment and check the audio quality. The audio should be clear within the maximum specified distances (1000 ft. [304.8 m] @ 60 Hz to 20 kHz; 1000 to 5000 ft. [304.8 to 1524.4 m] @ 100 Hz to 20 kHz).

4. Troubleshooting

4.1 Potential Problems

Symptom: Poor audio quality.

Probable Causes/Solutions:

1. EMI interference. Check that the wiring is not too close to transformers or ballasts.
2. Split pair. If the UTP pairs are split, correct the problem. Each signal pair must be twisted.

Symptom: No audio.

Probable Causes/Solutions:

1. Open contact. Check the wiring to ensure continuity.
2. Defective Audio Analog Balun. Change baluns for another pair.

Symptom: Weak audio.

Probable Causes/Solutions:

1. Exceeded distance specifications (see **Chapter 1** for distance limits). Check the DC loop resistance and verify if the distance specification is exceeded. Reduce cable length or eliminate high-loss components.
2. Lower-grade UTP cable is introducing high signal losses. Use a signal repeater for extended distance or replace the cable with a higher-grade cable.

4.2 Calling Black Box

If you determine that your Audio Analog Balun is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

4.3 Shipping and Packaging

If you need to transport or ship your Audio Analog Balun:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the balun for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Doc. No. 94-000370-A; SE-000377-A

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746