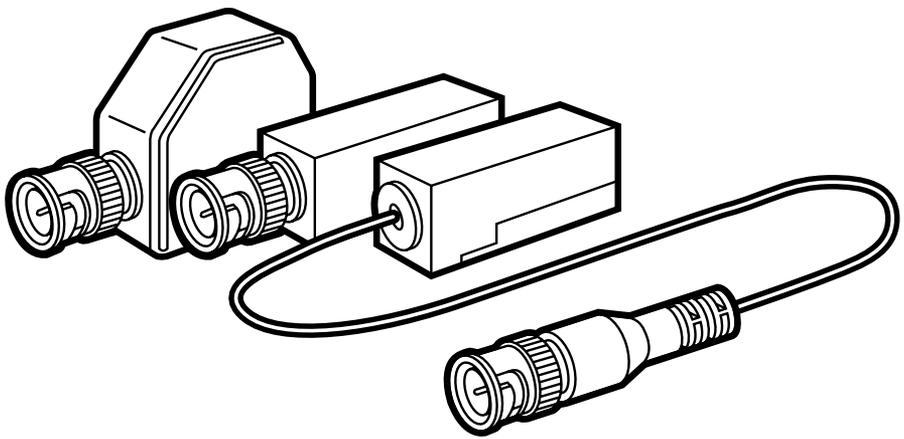




Video Balun CCTV Video Balun CCTV Mini Coax Balun



**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

VELCRO is a registered trademark of Velcro Industries B.V.

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

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1. Specifications

Cable Required:	Between balun pairs: Unshielded twisted pair (UTP): Construction Standard: Category 3 or higher; Gauge: 24 AWG or lower; Termination: IC440A: RJ-45 plugs; IC444A: Screw terminals; IC451A: Mini coax cable to screw terminals; Pairs: 1 or more (2 wires used); Impedance: 100 ohms @ 1 MHz; Maximum Capacitance: 20 pF/ft. (6.1 pF/m); Maximum Attenuation: 6.6 dB/1000 ft. (2 dB/km); To attached devices: Balun normally attaches directly to equipment; if cable must be used, it must be standard 75-ohm RG59/U coaxial cable with a BNC female connector on the balun end
Standard:	Composite (baseband) video: NTSC, PAL, or SECAM
Impedance:	Coaxial side: 75 ohms; UTP side: 100 ohms
Video Bandwidth:	DC to 8 MHz
Maximum RF Input:	1.1 volts at 60 Hz
Insertion Loss:	Less than 2 dB over the DC-to-8-MHz frequency range
Return Loss:	Greater than 15 dB over the DC-to-8-MHz frequency range
Common-Mode Rejection:	Greater than 40 dB at 8 MHz
Maximum Distance:	With Category 3 cable: 1200 ft. (365.8 m) for color video, 1500 ft. (457.2 m) for black & white video; With Category 5 cable: 2200 ft. (670.6 m) for color video, 2500 ft. (762 m) for black & white video
RJ-45 Pins Used:	7 (Ring) and 8 (Tip), reverse-polarity-sensing

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Connectors: IC440A: (1) RJ-45 female, (1) BNC male;
IC444A: (2) screw terminals, (1) BNC male
IC451A: (2) screw terminals, (1) mini BNC male on an 8"
(20.3-cm) cable

Temperature

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

Humidity

Tolerance: Up to 95% noncondensing

Enclosure: Fire-retardant plastic

Size: IC440A: 1"H x 0.8"W x 1.8"D (2.5 x 2 x 4.6 cm);
IC444A: 0.6"H x 0.6"W x 2.3"D (1.5 x 1.5 x 5.8 cm);
IC451A: 1.3"H x 0.5"W x 0.5"D (3.3 x 1.3 x 1.3 cm)

Weight: 0.7 oz. (19.8 g)

2. Introduction

With the Video Balun, CCTV Video Balun, and CCTV Mini Coax Balun, you can transmit composite baseband video signals across Category 3 or better unshielded twisted-pair (UTP) cable, which is already wired into most commercial sites. Use pairs of baluns to transmit standard NTSC, PAL, or SECAM composite video: The balun near the video source takes a single composite baseband video signal from 75-ohm coaxial cable, converts it, and transmits it over UTP cable to the other balun, which puts it back on coax and sends it to its destination.

Connect the Video Balun (IC440A) to a site's structured cabling through a modular wall jack in the work area. Each Video Balun has a BNC connector at one end and an RJ-45 jack at the other end.

Connect the CCTV Video Balun (IC444A) to a site's structured cabling by screwing a wire pair into its terminals. Each CCTV Video Balun has a BNC connector at the other end.

Connect the CCTV Mini Coax Balun (IC451A) to a site's structured cabling by screwing a wire pair into its terminals. Each CCTV Mini Coax Balun has a mini BNC connector on an 8" (20.3-cm) cable at the other end.

The Video Balun is designed for use with modular equipment and flexible configurations, while the CCTV Video Balun and CCTV Mini Coax Balun are designed for use with fixed equipment and semi-permanent configurations. Compatible devices include CCTV cameras and monitors, videocassette recorders (NTSC, PAL, or SECAM), laserdisc and DVD players, videoconferencing hardware, and other baseband audiovisual equipment. Applications include modular security/surveillance monitoring, video bulletin boards, financial information services, news services, education, video training, airport displays, video capture, and informational displays in stock exchanges, hotels, and convention centers.

The baluns *must* be used in pairs. However, you can install one balun type (such as the IC440A) at one end of the connection and install another balun type (such as the IC451A or IC444A) at the opposite end.

3. Installation

To install a pair of Video Baluns, CCTV Video Baluns, or CCTV Mini Coax Baluns, follow these steps:

CAUTION!

It is necessary to open CCTV Video Baluns (IC444A) and CCTV Mini Coax Baluns (IC451A) in order to install them, but do *not* attempt to open the housings of Video Baluns (IC440A). There are no user-serviceable parts inside.

1. Make sure that the video-destination device is not too far away from the video-source device (refer to the **Maximum Distance** specification in **Chapter 1**). If the destination device is beyond the source balun's reach, the video signal the device receives will be weak or nonexistent.
2. Follow the manufacturer's instructions for turning off power to the video equipment you will be attaching, and for disconnecting that equipment from AC power and from all other devices.
3. Make certain that the telecommunications outlets and cross-connects to which you will connect the baluns are configured properly and are labeled so that the circuit can be identified.

CAUTION!

Do *not* connect the Video Balun, CCTV Video Balun, or CCTV Mini Coax Balun to a telecommunication outlet wired to unrelated equipment. Making such a connection may damage the equipment and/or the balun. Make sure that all wiring is pinned straight through.

4. Verify that the twisted-pair circuit you want to use is not already being used for other LAN or telephone equipment.
5. *Optional:* Each balun comes with VELCRO® mounting pads. To mount a balun to a surface, first make sure that that surface is free of dust, oil, etc., so the VELCRO will adhere to it. Then peel off the adhesive backing, attach one side of the pads to the balun, and attach the other side to the surface.

CAUTION!

Do *not* mount the balun over equipment-ventilation openings. Doing so might damage the balun or cause the equipment to overheat.

6. For each balun—depending on what type of equipment you are attaching it to—either plug its BNC male connector directly into the device's BNC female connector, or plug the balun into a cable that runs to the device (this cable must have a BNC female connector on the balun end).

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- 7A. *Video Baluns (IC440A) only*: Connect one end of a UTP cable to each balun's RJ-45 modular jack, as shown in Figure 3-1. These cables must carry at least one wire pair; these wires must be on RJ-45 Pins 7 (Ring) and 8 (Tip).
- 7B. *CCTV Video Baluns or CCTV Mini Coax Baluns (IC444A or IC451A) only*: Look closely at the top of the terminal end of one of your baluns. You will notice two small holes. These are where your wires will enter the balun. Once you find the holes, carefully slide off each balun's top panel (it slides toward the terminal end). You will see an internal terminal behind each of the external terminal screws. Lay the UTP cable's twisted-pair wires in the grooves where the holes you found are; then insert one of the wires in one terminal and insert the other wire in the other terminal, as shown in Figure 3-1. (You might have to unscrew the screws slightly to do this. It doesn't matter which wire goes to which terminal, although we recommend straight-through wiring.) Tighten the screws and carefully slide the balun's top panel back on.

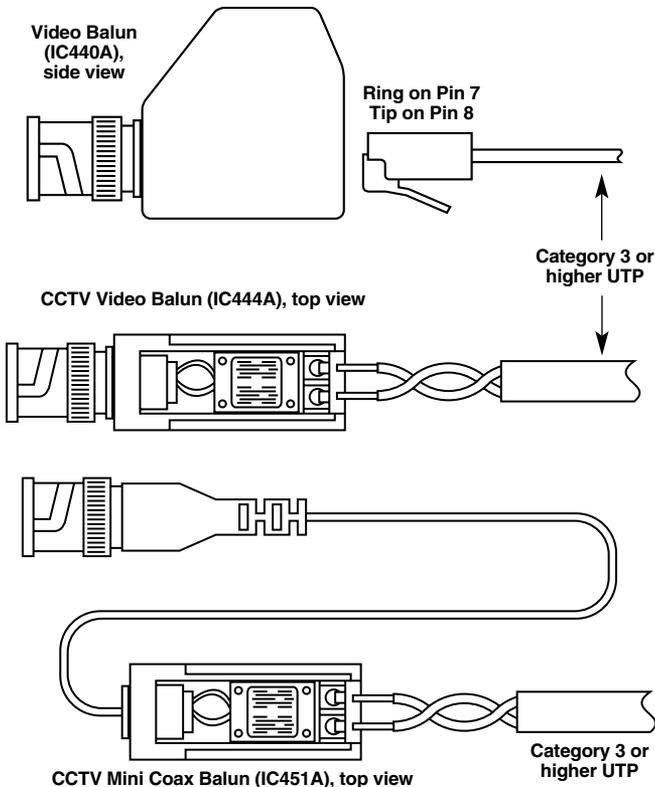


Figure 3-1. Attaching UTP cable to the balun.

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- Plug or hardwire the other end of each UTP cable into the appropriate video wall outlet or patch panel. When this is done, a complete cabling circuit should run between the two baluns, as shown in Figure 3-2.

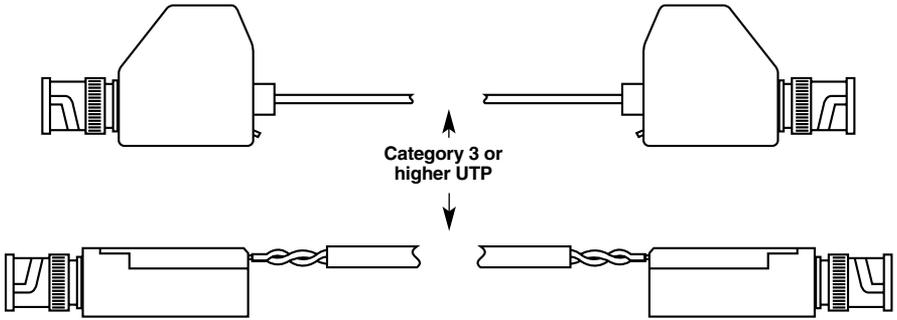


Figure 3-2. Two baluns cabled together.

Figure 3-3 shows a typical application using all three balun models.

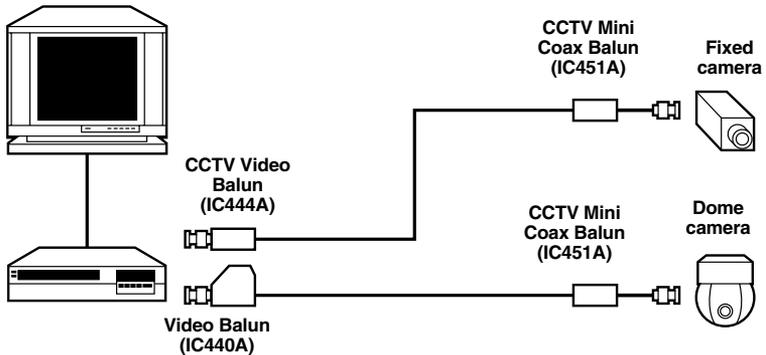


Figure 3-3. Connecting two cameras to a PC via three baluns.

- Reconnect and power up the video equipment.

Your balun system should be ready for continuous operation.

4. Troubleshooting

4.1 Things to Try If Problems Occur

If at any time your Video Balun, CCTV Video Balun, or CCTV Mini Coax Balun does not seem to be working properly, take these steps:

1. Following the manufacturer's instructions, perform diagnostics on your video equipment.
2. If this doesn't solve the problem, check all cable connections and the integrity of your site wiring.
3. You might be trying to transmit the video signals across too great a length of cable. The maximum distance over which the baluns can transmit and receive video signals depends on your cable and your video equipment; refer to the **Maximum Distance** specification in **Chapter 1**.
4. Make sure that the patch cord you are running between the balun and your site's wiring system is the correct cable type and is properly pinned (see the **Cable Required** specification in **Chapter 1**).
5. If possible, replace the baluns involved in the problem with baluns that are known to be working, one at a time. If at any point the problem goes away, there is probably a defect in the balun you just replaced.
6. If you still cannot diagnose the problem, call Black Box for technical support as described in the next section.

4.2 Calling Black Box

If you determine that your Video Balun, CCTV Video Balun, or CCTV Mini Coax Balun is malfunctioning, *do not attempt to alter or repair the unit*. It contains no user-serviceable parts. Contact Black Box Technical Support 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; and
- the results of any testing you've already done.

4.3 Shipping and Packaging

If you need to transport or ship your Video Balun, CCTV Video Balun, or CCTV Mini Coax Balun:

- Package it carefully. We recommend that you use the original container.
- If you ever ship the balun back to us for any reason, contact Black Box to get a Return Authorization (RA) number.



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