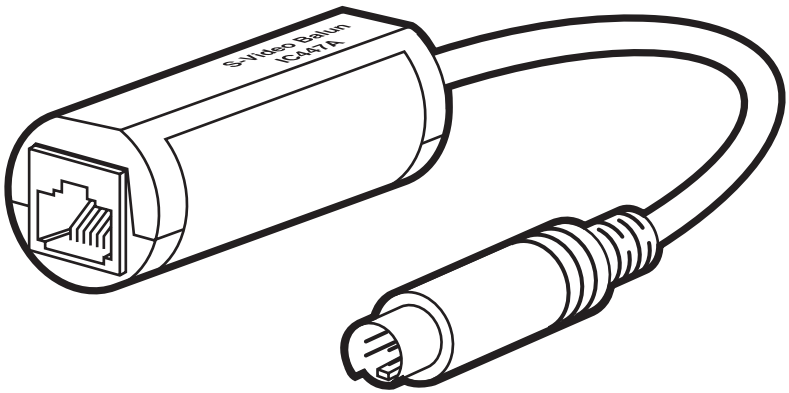
DECEMBER 2002
IC447A

S-Video 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

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

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

To meet FCC requirements, shielded cables are required to connect this device to other Class B certified devices.

This digital apparatus does not exceed the Class B 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 classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

TRADEMARKS USED IN THIS MANUAL

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

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Contents

1. Specifications

Cable Required: Between balun pairs: Unshielded twisted pair (UTP):
Construction standard: Category 5;
Gauge: 24 AWG or lower;
Core: Solid;
Termination: RJ-45 plugs;
Pairs: 2 or more (4 wires used);
Impedance: 100 ohms at 1 MHz;
Maximum capacitance: 20 pF/ft. (6.1 pF/m);
Maximum attenuation: 6.6 dB/1000 ft. (2 dB/km) at 1 MHz;
To attached devices: Balun normally attaches directly to equipment; if cable must be used, it must be standard 75-ohm S-Video cable with a 4-pin mini-DIN female connector on the balun end

Compliance: FCC Class B, IC Class/classe B;
CISPR Pub. 22 Class B

Transmission: Transparent to users (automatic, no delay)

Impedance: S-Video side: 75 ohms;
UTP side: 100 ohms

Video Bandwidth: DC to 6 MHz

Maximum Input: 1.1 volts peak-to-peak

Insertion Loss: Less than 2 dB per pair over the DC-to-6-MHz frequency range

Return Loss: Greater than 15 dB over the DC-to-6-MHz frequency range

Common-Mode Rejection: Greater than 40 dB over the DC-to-6-MHz frequency range

Maximum Distance: 1000 ft. (304.8 m) of CAT5 cabling between baluns

Connectors: (1) RJ-45 female, (1) 4-pin mini-DIN male

RJ-45 Pins Used:	4 (C/chrominance ring), 5 (C/chrominance tip), 7 (Y/luminance ring), and 8 (Y/luminance tip); polarity-sensitive (*not* autosensing or autocorrecting)
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:	1"H x 1"W x 1.9"D (2.5 x 2.5 x 4.8 cm), with a nondetachable 5" (12.7-cm) S-Video cord
Weight:	1 oz. (28 g)

2. Introduction

With pairs of S-Video Baluns, you can transmit a single S-Video signal point-to-point across Category 5 unshielded twisted-pair (UTP) cable, which is already wired into most commercial sites. The balun near the video source takes a single S-Video signal from the source, converts it, and transmits it over UTP cable to the other balun, which outputs it to its destination. This lets you place or move your S-Video equipment anywhere you have a modular wall outlet.

The S-Video Balun is designed for use with modular equipment and flexible configurations. Compatible devices include S-Video video cameras and monitors, DVD and videocassette players and recorders, video and LCD projectors, CCD cameras, video switchers, sequencers, multiplexors, and other S-Video equipment. Applications include classroom video distribution, overhead projector systems, computer-training systems, and tradeshow computer-demo systems.

These baluns must be used in pairs.

3. Installation

To install a pair of S-Video Baluns, follow the steps below.

CAUTION!

Do *not* attempt to open the housings of the S-Video Baluns. 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 reach of the source balun, 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 modular 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 S-Video 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 straight-through-pinned.

4. Verify that the twisted-pair circuit you want to use is not already being used for other LAN or telephone equipment.

5. For each balun—depending on what type of equipment you are attaching it to—either plug the 4-pin mini-DIN male connector at the end of its S-Video cord directly into the device's 4-pin mini-DIN female S-Video connector, or plug the balun into an S-Video cable with 4-pin mini-DIN connectors that runs to the device.

6. 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 two wire pairs; these wires must be on RJ-45 Pins 4 (C/chrominance ring), 5 (C/chrominance tip), 7 (Y/luminance ring), and 8 (Y/luminance tip).

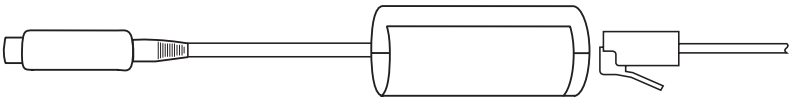

Figure 3-1. Attaching UTP cable to the balun.

7. 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.

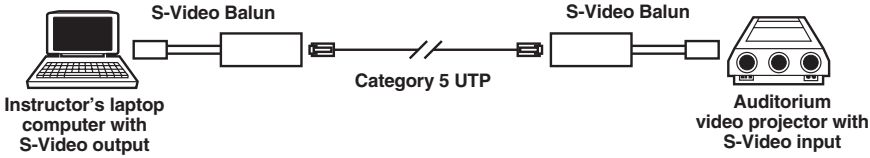

Figure 3-2. Two baluns cabled together (not to scale).

8. Reconnect and power up the video equipment. Adjust the image settings of any attached monitor or projector as necessary.

Your balun system should be ready for continuous operation.

4. Troubleshooting

4.1 Things to Try If Problems Occur

If at any time your S-Video Balun system 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 and pinning of your site wiring. Check for reverse polarity; the baluns do not autosense or autocorrect polarity.

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 the S-Video 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 S-Video 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.

Doc. No. 94-000340-A

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