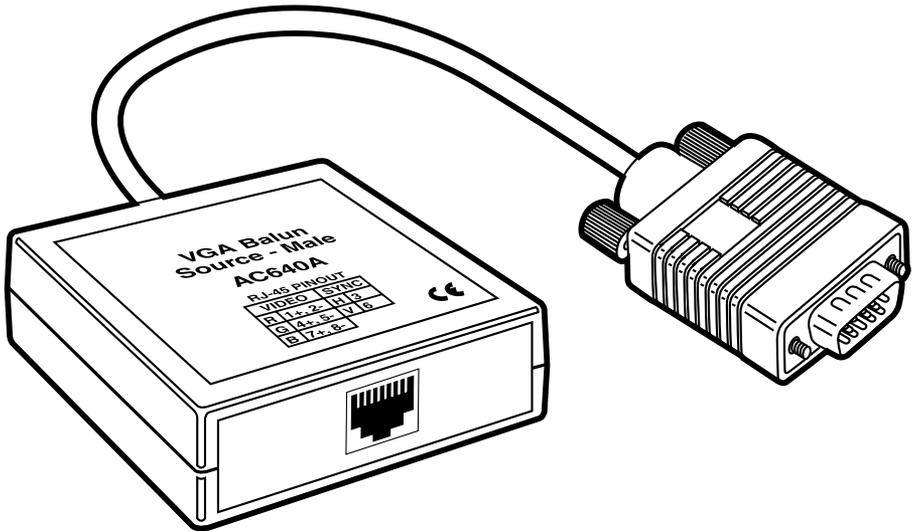




VGA Source Balun VGA Display Baluns



**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.

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1. Specifications

Standards: VGA, VESA VP&D, VIP ver. 2.0

Compatible Devices: VGA monitors, laptops, multimedia projectors, PCs, flat-panel displays

Transmission: Transparent to the user

Bandwidth: Video: DC to 60 MHz

Input Signals: Video: 1.1 Vp-p; Horizontal and vertical sync: TTL standard, 300 kHz maximum bandwidth

Insertion Loss: Less than 3 dB per balun pair over the frequency range

Common Mode Rejection (CMMR): 15 kHz @ -60 dB maximum, 100 kHz to 10 MHz @ -40 dB maximum, 100 MHz @ -20 dB maximum

Video Signal Return Loss: -15 dB maximum from DC to 60 MHz

Video Differential Gain: $\pm 2\%$

Video Differential Phase: $\pm 2\%$

Maximum Distance via CAT5 UTP: 640 x 480 pixels (15 MHz) @ 450 ft. (137.2 m);
800 x 600 pixels (30 MHz) @ 350 ft. (106.7 m);
1024 x 768 pixels (60 MHz) @ 250 ft. (76.2 m);
1280 x 1624 pixels (100 MHz) @ 200 ft. (61 m)

Cable: CAT5 shielded twisted pair (STP) is recommended; unshielded twisted pair (UTP) may be used only when there is a 100% common signal ground between the VGA source and the VGA display

Impedance: Input: RGB 75 ohm (DB15 HD) unbalanced;
Output: RGB 100 ohm (RJ-45 shielded) balanced;
Horizontal and vertical sync: TTL standard

Mounting: Freestanding; Separate VELCRO® mounting pad included

Connectors: AC640A: (1) RJ-45 shielded, (1) DB15 HD plug and (6) leads
(connect to the PC's VGA output);

AC641A: (1) RJ-45 shielded, (1) DB15 HD receptacle (connects to the monitor's
VGA input);

AC642A: (1) RJ-45 shielded, (1) DB15 HD plug and (6) leads (connect to the
monitor's VGA input)

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: ABS fire-retardant plastic

Size: 0.9"H x 0.9"W x 0.4"D (2.3 x 2.3 x 1 cm)

2. Overview

Instead of using bulky VGA cable to connect your video equipment (monitors, PCs, laptops, multimedia projectors, and flat-panel displays) together, use existing twisted-pair cable. The VGA balun pairs (VGA Source Balun and VGA Display Baluns) allow VGA video signals to be transmitted up to 450 ft. (137.2 m) via 4-pair CAT5 twisted-pair cable. They're ideal for classroom video distribution, overhead projector systems, PC-training systems, and tradeshow PC demo systems.

You'll need one VGA Source Balun (AC640A) and one VGA Display Balun (AC641A [female] or AC642A [male]). One VGA Source Balun (AC640A) connects to the VGA source (output) and one VGA Display Balun (AC641A or AC642A) connects to the VGA destination (monitor input).

The VGA Balun transmits the RGB video's horizontal and vertical synchronization pulses. Since the VGA Balun is a passive device and uses only 8 wires, it does not support VGA handshaking/control signals.

To ensure reliable signal continuity between the equipment, use shielded twisted-pair (STP) cable terminated with shielded RJ-45 connectors.

3. Installation

To install the VGA Balun, follow these steps:

CAUTION

Do not attempt to open the housing. There are no user-serviceable parts inside the balun. Opening the unit will void your warranty.

1. For reliable signal continuity between the equipment, use shielded twisted-pair (STP) cable terminated with shielded RJ-45 connectors.
2. Since the VGA Balun does not support VGA handshaking and control signals, set the monitor attributes before installing the VGA Baluns. To do this, first connect the standard VGA cable directly from the PC to the monitor. Then set the monitor attributes to the required settings (resolution, color, etc). Also, to achieve optimum results via twisted pair, set the Contrast and Brightness levels to maximum.
3. Turn off the power and disconnect the PC and VGA display equipment by following the manufacturer's instructions.
4. Make certain that modular outlets and cross connects to which you will connect the VGA Balun are configured properly and labeled appropriately to identify the circuit.

CAUTION

Do not connect the VGA 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" twisted pair.

5. Verify that the desired twisted pairs are not being used for other LAN or telephone equipment.

NOTE

The baluns operate in pairs.

6. Connect the VGA Source Balun (AC640A) to the PC's or VGA splitter/booster's VGA port. Tighten the mounting screws on each balun.

CAUTION

Do not mount the balun over equipment ventilation openings. Covering the openings may cause the equipment to overheat.

VGA SOURCE AND DISPLAY BALUNS

7. Connect a 4-pair CAT5 cable from the balun's RJ-45 8-position modular jack to the building's twisted-pair cabling.
8. Connect a VGA Display Balun (AC641A [female] or AC642A [male]) to the VGA display screen.
9. Connect a 4-pair CAT5 cable from the balun's RJ-45 connector to the appropriate modular wall outlet. See the typical applications shown in Figures 3-1 through 3-4.
10. Power on the PC and the VGA monitor.
11. Set monitor Contrast and Brightness to the desired levels.

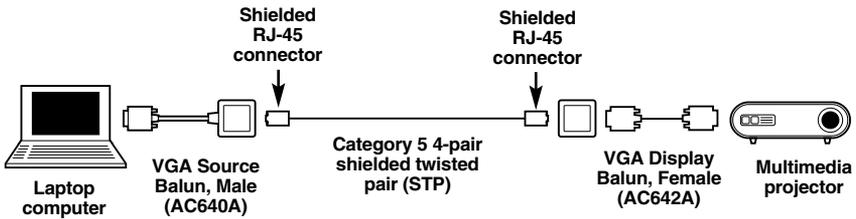


Figure 3-1. Connecting a multimedia projector to a laptop computer.

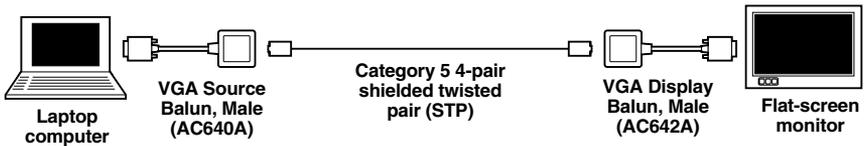


Figure 3-2. Connecting a flat-screen monitor to a laptop computer.

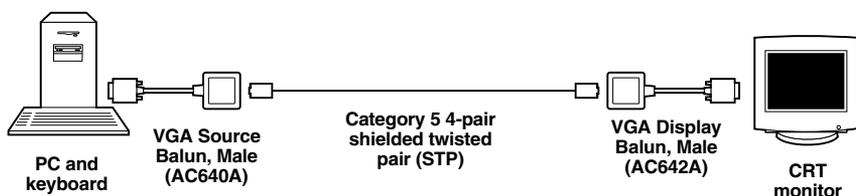


Figure 3-3. Connecting a CRT monitor to a PC and keyboard.

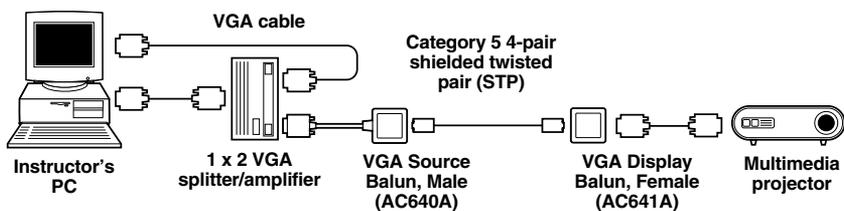


Figure 3-4. Connecting a multimedia projector to an instructor's computer.

4. Troubleshooting

4.1 Troubleshooting Tips

If your equipment malfunctions with the VGA Baluns in place, follow the troubleshooting procedures below:

1. Perform diagnostics on your video equipment by following the manufacturer's instructions.
2. Check all the connections and verify the pin configuration.
3. The maximum distances supported by the VGA Balun depend on the type of UTP cable and the PC's VGA interface's image resolution. Make sure that the maximum recommended operational distances have not been exceeded.
4. Check that only twisted-pair patch cords are being used.
5. Replace the VGA Balun with another balun that is known to be working properly.
6. If you still cannot diagnose the problem, call Black Box Technical Support as described in **Section 4.3**.

4.2 Application Tips

1. For proper operation, the VGA source and VGA display must share a common ground. When the signal ground between the VGA source and the VGA display is not common, then you must use CAT5 shielded twisted-pair cable and shielded RJ-45 connectors. For more information, call Black Box Technical Support at 724-746-5500.
2. The VGA Balun does not support the VGA handshaking and control signals required by certain video monitors. Before installing the VGA Baluns, connect the standard VGA cable between the VGA source and destination, then set the monitor to the desired attributes. Install the VGA Baluns and the twisted-pair cable.
3. For optimum results and maximum distance performance, first set the brightness and contrast levels on the monitor to the maximum settings. Then install the VGA Baluns and the monitor in its final location. After the monitor is installed, adjust the brightness and contrast to the desired levels.

4. If the video image is not present or is poorly synchronized, there may be a grounding problem or a high level of noise on the line. To correct the problem, verify ground continuity on the baluns' transmitting and receiving pins or use shielded twisted-pair (STP) cable between the baluns.
5. In certain PC applications such as Microsoft® PowerPoint® presentations, image resolution may be less critical, so longer than specified distances may be achieved.

4.3 Calling Black Box

If you determine that your VGA Source Balun or VGA Display 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.

4.4 Shipping and Packaging

If you need to transport or ship your VGA 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.



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