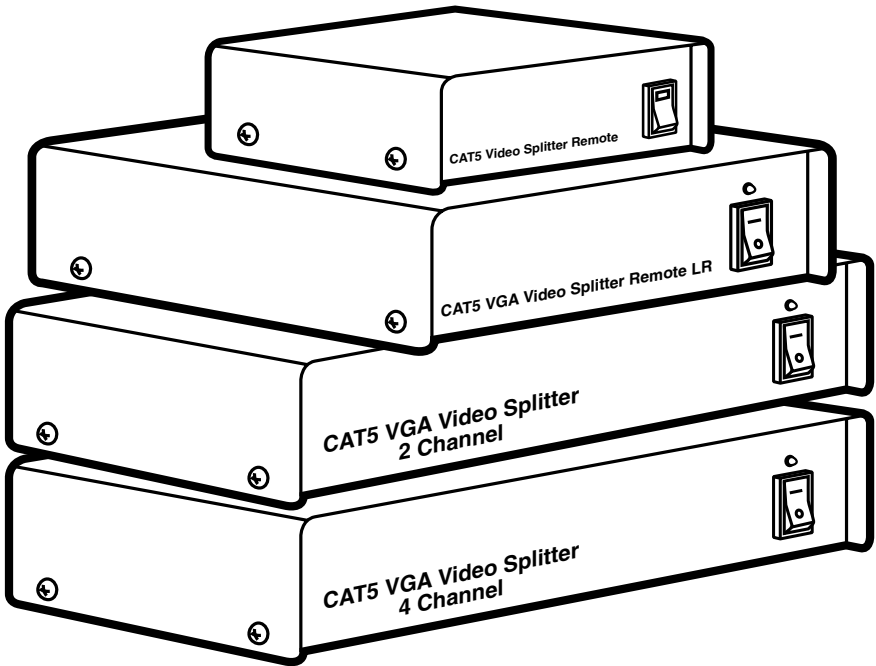




CAT5 VGA Video Splitter



**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.

**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 conectado 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 física 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 líneas de energía.
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 objetos líquidos 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: Objetos 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.

TRADEMARKS

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

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1. Specifications

System Requirements: 2-channel models: (1) PC, (1) local monitor,
(2) remote monitors;
4-channel models: (1) PC, (1) local monitor, (4) remote monitors

I/O Signals: Video signals: Red, Green, Blue, 0.7 Vp-p/75 ohms positive;
Sync: TTL vertical and horizontal

Resolution: Monitor: 1280 x 1024;
Horizontal: 30 to 100 kHz;
Vertical: 43 to 100 Hz

Transmission: Remote Standard Splitter to monitor: 360 ft. (109.7 m);
Remote Long-Range Splitter to monitor: 820 ft. (250 m)

Cables: 4-pair Category 5 twisted pair, 24 AWG

Connectors: AC500A-R2: Input port: (1) HD15 male,
Pass-through port: (1) HD15 female,
Interconnect port: (2) RJ-45;
AC501A-R2: Input port: (1) HD15 male,
Pass-through port (1) HD15 female,
Interconnect ports: (4) RJ-45;
AC502A-R2, AC503A-R2: Input port: (1) HD15 female,
Output port: (1) RJ-45

Enclosure: Shielded metal box

Power: Autosensing power supply: Input: 100–240 VAC, 50–60 Hz, 0.3 A;
Output: 6 VDC, 2 A

Size: AC500A-R2, AC501A-R2: 1.6"H x 7.7"W x 4.1"D (4.1 x 19.6 x 10.4 cm);
AC502A-R2: 1.6"H x 4.4"W x 3.5"D (4.1 x 11.2 x 8.9 cm);
AC503A-R2: 1.6"H x 6.3"W x 5"D (4.1 x 16 x 12.7 cm)

2. Introduction

2.1 Overview

The CAT5 VGA Video Splitter simultaneously distributes a CPU's picture to several monitors at up to 360 ft. (109.7 m) using CAT5 UTP cables—without losing any picture quality.

The CAT5 VGA Video Splitter supports AT®, PS/2®, or PC/XT™ computers and VGA, SVGA, or XGA video standards.

2.2 How to Use This Manual

This manual is divided into five chapters:

- **Chapter 1** lists technical specifications for the splitters.
- **Chapter 2** describes the video splitter, what the package includes, and how to use this manual.
- **Chapter 3** explains how to install the video splitter system. It also illustrates and explains the front and rear panels of both local and remote units.
- **Chapter 4** describes the splitter's front-panel operations and the rear-panel connections.
- **Chapter 5** describes how to troubleshoot the splitter.

If, after reading this manual, you have questions, please call Black Box Technical Support at 724-746-5500.

2.3 What the Package Includes

Your package should include the following items. If anything is missing or damaged, please contact Black Box at 724-746-5500.

2.3.1 2-PORT CAT5 VGA VIDEO SPLITTER

The 2-port host module (AC500A-R2) comes with:

- (1) 2-Port CAT5 VGA Video Splitter
- (1) DB15 HD male to DB15 HD female screen cable

- (1) 100–240-VAC autosensing power supply
- (1) power cord
- This users' manual

2.3.2 4-PORT CAT5 VGA VIDEO SPLITTER

The 4-port host module (AC501A-R2) comes with:

- (1) 4-Port CAT5 VGA Video Splitter
- (1) 5-ft. (1.5-m) DB15 HD male to DB15 HD female screen cable
- (1) 100–240-VAC autosensing power supply
- (1) power cord
- This users' manual

2.3.3 REMOTE STANDARD CAT5 VGA VIDEO SPLITTER

You'll need one remote standard or remote long-range splitter for each monitor you want to connect. This model (AC502A-R2) lets you connect the remote unit up to 360 ft. (109.7 m) away from the host. For longer distances, choose the long-range model described in **Section 2.3.4**.

- (1) Remote CAT5 VGA Video Splitter
- (1) RJ-45 male to RJ-45 male system cable
- (1) 100–240-VAC autosensing power supply
- (1) power cord
- This users' manual

2.3.4 REMOTE LONG-RANGE CAT5 VGA VIDEO SPLITTER

You'll need one remote standard or remote long-range splitter for each monitor you want to connect. This model (AC503A-R2) lets you connect the remote unit up to 820 ft. (250 m) away from the host.

- (1) Remote Long-Range CAT5 VGA Video Splitter
- (1) RJ-45 male to RJ-45 male system cable
- (1) 100–240-VAC autosensing power supply

- (1) power cord
- This users' manual

2.4 Typical Applications

Figure 2-1 shows a 2-Port VGA Video Splitter (central unit) broadcasting data to two remote monitors via two Remote Standard CAT5 VGA Video Splitters or Remote Long-Range CAT5 VGA Video Splitters.

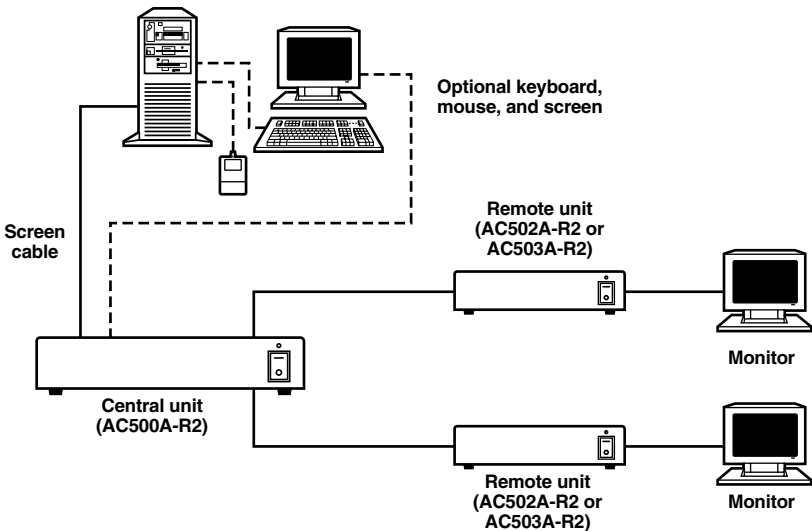


Figure 2-1. Typical application using the 2-Port VGA Video Splitter.

Figure 2-2 shows a 4-Port VGA Video Splitter (central unit) broadcasting data to four remote monitors via four Remote Standard CAT5 VGA Video Splitters or Remote Long-Range CAT5 VGA Video Splitters.

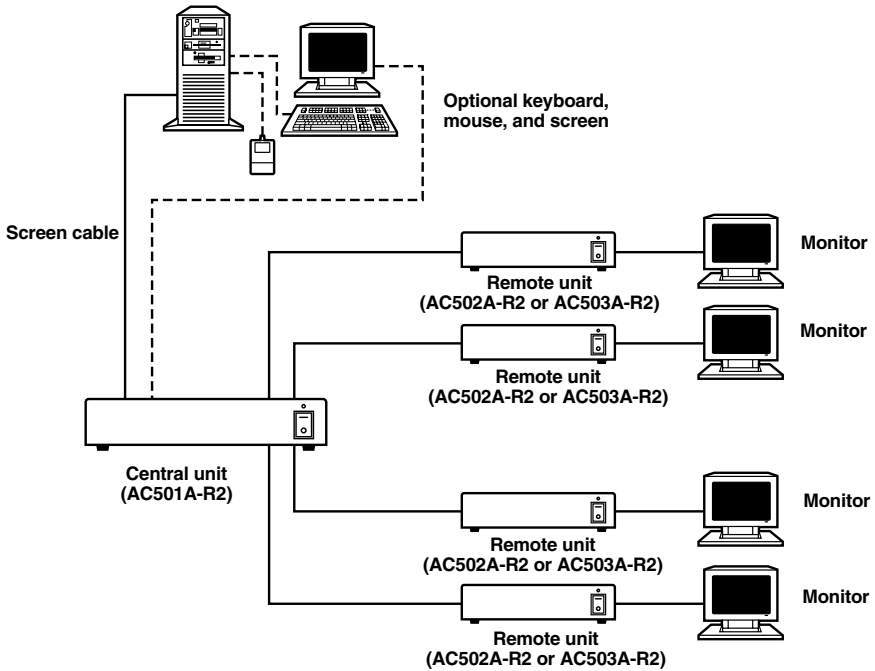


Figure 2-2. Typical application using the 4-Port VGA Video Splitter.

3. Installation

This chapter describes how to connect the system cables, the screen cable, and the power supply to the CAT5 Video Splitter System using the Remote Standard CAT5 Video Splitter or Remote Long-Range CAT5 Video Splitter in conjunction with:

- The 2-Port CAT5 VGA Video Splitter (central unit).
- The 4-Port CAT5 VGA Video Splitter (central unit).

3.1 Setting the DIP Switches (AC503A-R2 Only)

You can improve the picture quality and sharpness by setting the DIP switches (located on the bottom of the remote unit) for *coarse adjustment*.

1. The bottom of the remote unit contains DIP-switches G, B, and R.
See Figure 3-1.

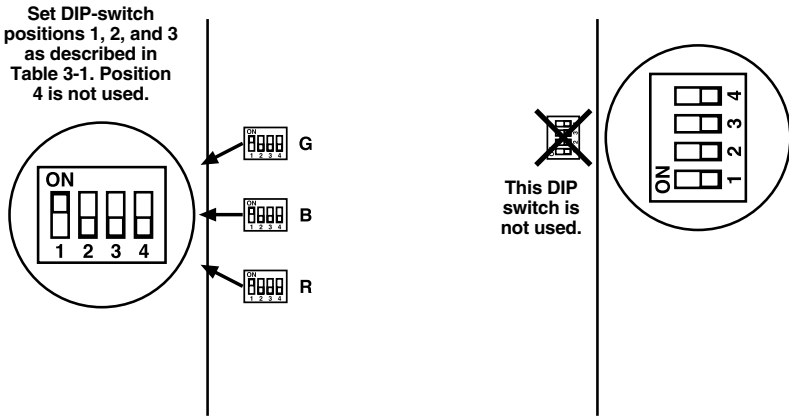


Figure 3-1. AC503A-R2 DIP-switch settings for coarse adjustment.

2. RGB compensation demands identical settings for all three DIP switches. Table 3-1 defines the appropriate DIP-switch settings.

NOTE

Set positions 1, 2, and 3 of DIP-switches R, G, and B as described in Table 3-1. Position 4 on each of the three DIP switches is not used.

Table 3-1. Screen resolution and refresh rates.

Cable Length		640 x 480	800 x 600	1024 x 768	1280 x 1024
meters	feet	75 Hz	75 Hz	75 Hz	75 Hz
50	165	1, 2, 3—OFF	1, 2, 3—OFF	1, 2, 3—OFF	1, 2, 3—OFF
100	330	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF
150	490	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF
200	655	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF	1—ON, 2, 3—OFF
250	820	1, 2—OFF, 3—ON	1, 2—OFF, 3—ON	1, 2—OFF, 3—ON	1, 2—OFF, 3—ON
*300	*980	1, 3—ON, 2—OFF	1, 3—ON, 2—OFF	—	—
*450	*1475	1, 2, 3—ON	1, 2, 3—ON	—	—

*Use Potentiometer PIC for fine-tuning the picture’s quality; use Potentiometer BR for fine-tuning the picture’s brightness.

3.2 Installing the System Cables

The system cable you received with each remote unit ordered is a single 4-pair CAT5 UTP cable with two RJ-45 male connectors attached at each end, as shown in Figure 3-2. One system cable connects each remote unit to each system port on the central unit’s rear panel.

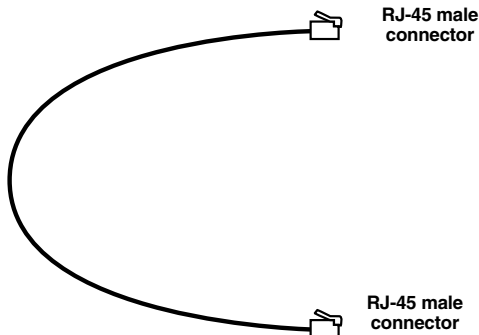


Figure 3-2. System cable.

3.2.1 CONNECTING THE 2-PORT CAT5 VGA VIDEO SPLITTER (CENTRAL UNIT)

You need to use two remote units and two system cables. You should have received one system cable with each remote unit you ordered.

To connect the system cables:

1. Connect one of the system cable's RJ-45 male connectors to the system 1 port on the central unit's rear panel.
2. Connect the other system cable's RJ-45 male connector to the system port on the remote unit # 1's rear panel.
3. Connect the second system cable's RJ-45 male connector to the system 2 port on the central unit's rear panel.
4. Connect the second system cable's RJ-45 male other connector to the system port on the remote unit # 2's rear panel.

3.2.2 CONNECTING THE 4-PORT CAT5 VGA VIDEO SPLITTER (CENTRAL UNIT)

You need to use four remote units and four system cables. You should have received one system cable with each remote unit that you ordered.

To connect the system cables:

1. Connect one of the system cable's RJ-45 male connectors to the system 1 port on the central unit's rear panel.
2. Connect the other system cable's RJ-45 male connector to the system port on the remote unit # 1's rear panel.
3. Repeat this scenario with the other three system cables—connecting the central unit's system 2, system 3, and system 4 ports to the system ports of remote units #2, #3, and #4, respectively.

3.3 Installing the Screen Cable

The screen cable has a DB15 HD male connector attached at one end, and a DB15 HD female connector attached at the other end. It connects the 2- or 4-Port CAT5 VGA Video Splitter central unit to the CPU.

Or, you can link a display screen to the CPU by connecting the display screen to the screen out port on the central unit's rear panel. You can also connect a keyboard and mouse to the CPU, which lets you update the data display on each remote display screen.

3.3.1 CONNECTING THE 2-PORT CAT5 VGA VIDEO SPLITTER AND REMOTE UNITS

Use a screen cable to connect the central unit to the CPU, and to connect each remote display screen to its corresponding remote unit.

To connect the screen cable to the central unit:

1. Connect the screen cable's DB15 HD male connector to the CPU's DB15 HD female screen port.
2. Connect the screen cable's DB15 HD female connector to the screen in port on the central unit's rear panel.

Or:

Connect the DB15 HD male connector from the display screen to the screen out port on the central unit's rear panel.

To connect the screen cable to the remote unit:

1. Connect the DB15 HD male connector from remote display screen # 1 to the DB15 HD female screen port on the remote unit # 1's rear panel.
2. Connect the DB15 HD male connector from remote display screen # 2 to the DB15 HD female screen port on the remote unit # 2's rear panel.

3.3.2 CONNECTING THE 4-PORT CAT5 VGA VIDEO SPLITTER AND REMOTE UNITS

Use a screen cable to connect the central unit to the CPU, and to connect each remote display screen to its corresponding remote unit.

To connect the screen cable to the central unit:

1. Connect the screen cable's DB15 HD male connector to the CPU's DB15 HD female screen port.
2. Connect the screen cable's DB15 HD female connector to the screen in port on the central unit's rear panel.

Or:

Connect the DB15 HD male connector from the display screen to the screen out port on the central unit's rear panel.

To connect the screen cable to the remote unit:

1. Connect the DB15 HD male connector from remote display screen # 1 to the DB15 HD female screen port on the remote unit # 1's rear panel.
2. Repeat this scenario with the other three remote display screens, connecting the DB15 HD male connectors from remote display screens #2, #3, and #4 to the DB15 HD female screen ports on the rear panels of remote units # 2, #3, and #4, respectively.

3.4 Connecting to the Power Supply

Connect each of the units—the 2- or 4-Port CAT5 VGA Video Splitter central unit, and the Remote Standard or Remote Long-Range CAT5 VGA Video Splitters—to the power supply in the following way.

To connect each unit to the power supply:

1. Connect the 9-VAC adapter plug to the power-cable connector.
2. Connect the power cable to the 9-VAC adapter and insert the mains plug into a wall socket. The unit is connected to the power supply. See Figure 3-3.

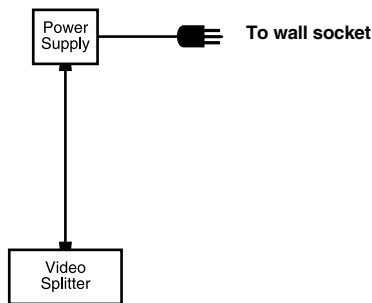


Figure 3-3. The power supply block diagram.

Figure 3-4 shows the splitter's entire cabling configuration.

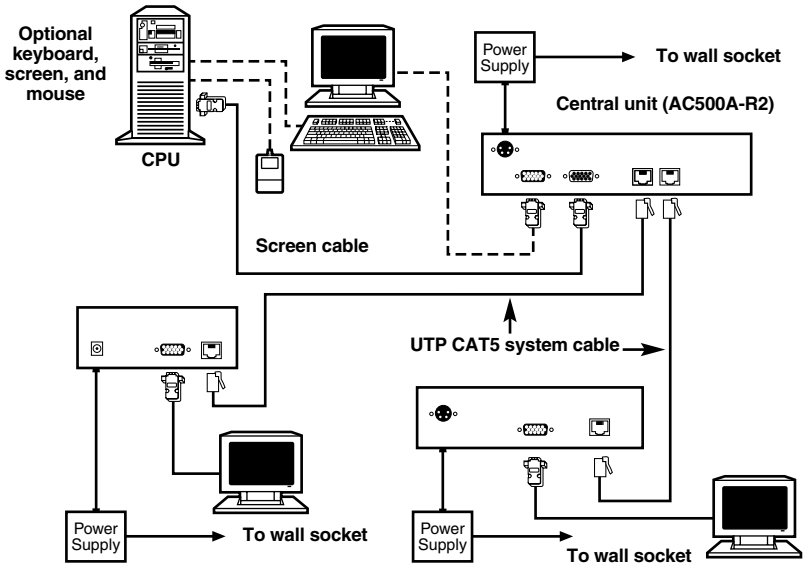


Figure 3-4. Cabling diagram for the CAT5 VGA Video Splitter system.

4. Operation

This chapter describes the front-panel operations and rear-panel connections of the following:

- 2-Port CAT5 VGA Video Splitter (central unit)
- 4-Port CAT5 VGA Video Splitter (central unit)
- Remote Standard CAT5 VGA Video Splitter
- Remote Long-Range CAT5 VGA Video Splitter

4.1 2-Port CAT5 VGA Video Splitter (Central Unit)

4.1.1 FRONT PANEL

Figure 4-1 shows the 2-port central unit's front panel.



Figure 4-1. Front panel (AC500A-R2).

Push the power switch to turn the power ON or OFF.

4.1.2 REAR PANEL

Figure 4-2 shows the 2-port central unit’s rear panel. Table 4-1 describes the basic hardware connections.

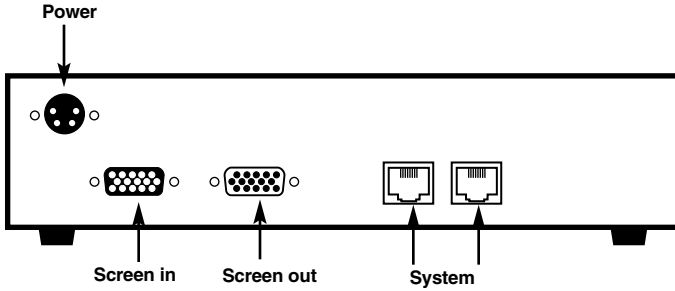


Figure 4-2. Rear panel (AC500A-R2).

Table 4-1. Connectors on the 2-port central unit’s rear panel.

Connector	Function
Power	Connect the 9-VAC, 1.5-A adapter’s power cable to this connector.
Screen In	Connect the screen cable’s DB15 HD female connector to this port.
Screen Out	Connect the DB15 HD male connector from the display screen to this port.
System #	Connect the two remote units’ system cables’ connectors to these two ports.

4.2 4-Port CAT5 VGA Video Splitter (Central Unit)

4.2.1 FRONT PANEL

Figure 4-3 shows the 4-port central unit's front panel.



Figure 4-3. Front panel (AC501A-R2).

Push the power switch to turn the power ON or OFF.

4.2.2 REAR PANEL

Figure 4-4 shows the 4-port central unit’s rear panel. Table 4-2 describes the basic hardware connections.

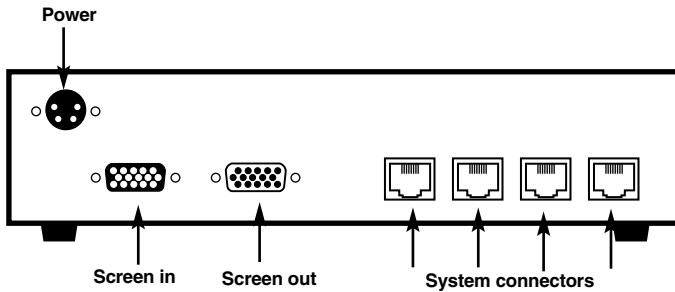


Figure 4-4. Rear panel (AC501A-R2).

Table 4-2. Connectors on the 4-port central unit’s rear panel.

Connector	Function
Power	Connect the 9-VAC, 1.5-A adapter’s power cable to this connector.
Screen In	Connect the screen cable’s DB15 HD female connector to this port.
Screen Out	Connect the DB15 HD male connector from the display screen to this port.
System #	Connect the four remote units’ system cables’ connectors to these four ports.

4.3 Remote Standard CAT5 VGA Video Splitter

4.3.1 FRONT PANEL

Figure 4-5 shows the Remote Standard CAT5 VGA Video Splitter's front panel.



Figure 4-5. Front panel (AC502A-R2).

Push the power switch to turn the power ON or OFF.

4.3.2 REAR PANEL

Figure 4-6 shows the remote standard unit's rear panel. Table 4-3 describes the basic hardware connections.

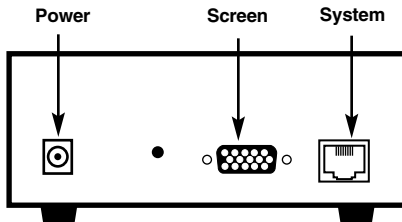


Figure 4-6. Rear panel (AC502A-R2).

Table 4-3. Connectors on the remote standard unit's rear panel.

Connector	Function
Power	Connect the 9-VAC, 1.5-A adapter's power cable to this connector.
Screen	Connect the display screen's connector to this port.
System #	Connect the system cable's connector to this port.

4.4 Remote Long-Range CAT5 VGA Video Splitter

4.4.1 FRONT PANEL

Figure 4-7 shows the Remote Long-Range CAT5 VGA Video Splitter's front panel.



Figure 4-7. Front panel (AC503A-R2).

Push the power switch to turn the power ON or OFF.

4.4.2 REAR PANEL

Figure 4-8 shows the remote long-range unit's rear panel. Table 4-4 describes the basic hardware connections.

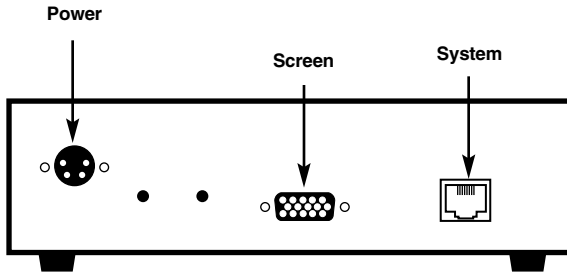


Figure 4-8. Rear panel (AC503A-R2).

Table 4-4. Connectors on the remote long-range unit's rear panel.

Connector	Function
Power	Connect the 9-VAC, 1.5-A adapter's power cable to this connector.
Screen	Connect the display screen's connector to this port.
System #	Connect the system cable's connector to this port.

4.5 Switching On the Units

When the CAT5 VGA Video Splitter system is properly connected, you're ready to switch on each of the units—the CPU, the central unit, the remote units, and the remote display screens. You can switch them on in any order.

Each remote display screen shows the CPU's data simultaneously.

5. Troubleshooting

5.1 Calling Black Box

If you determine that your CAT5 VGA Video Splitter 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.

5.2 Shipping and Packaging

If you need to transport or ship your CAT5 VGA Video Splitter:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the video splitter 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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