



BLACK BOX[®]
NETWORK SERVICES



March 2005
AC600A
AC601A
AC602A

VGA-to-CAT5 Video Splitters and Receiver



AC600A (Shown) & AC601A
2 & 4 Channel VGA to Cat5 Splitter / Extender



AC602A
VGA over Cat5 Receiver

**CUSTOMER
SUPPORT
INFORMATION**

Order **toll-free** in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**
FREE technical support, 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

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**FEDERAL COMMUNICATIONS COMMISSION
AND CANADIAN DEPARTMENT OF COMMUNICATIONS
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 the Canadian Department of Communications.

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 le ministère des Communications du Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

This product complies with the requirements of the European EMC directive 89/336/EEC



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 de 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 bloquear 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 debe 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.

Contents

1. Introduction	page 5
1.1 General	page 5
1.2 Features	page 5
2. Installation	page 6
3. Configuration & Operation	page 8
4. Troubleshooting	page 9
5. Specifications.....	page 10

1. Introduction

1.1 General

This manual describes the features, setup, and operation of the Black Box 2 and 4 channel VGA-to-CAT5 Video Splitters/Extenders and their corresponding Receiver.

The splitters convert a PC's VGA signal into a format that can be transmitted using inexpensive and commonly available Category-5/5e/6 Unshielded Twisted Pair (UTP) cable to 500 feet away.

At the receiving (remote) ends the Cat5 signal is converted back to VGA for connection to monitors, projector or other display devices.

Besides the 2 or 4 RJ45 outputs, the splitters feature a VGA connector for connection to a local monitor or for daisy-chaining to other splitters.

Furthermore, the splitters include a power supply that is capable of powering itself and all the AC602A Receivers (phantom power) which makes for a clean and easy setup (*note that if the length of Cat5 cable is longer than 300 feet to a particular receiver, the receiver may require its own power supply*).

The system can also transmit Component Video (Y Pb Pr at resolutions to 1080i) instead of VGA with the purchase of HD15-to-3RCA break-out cable for each end. Therefore you can use these devices to send Standard TV and HDTV component video to multiple locations.

1.2 Features

- Send PC or Component Video at full-resolution to multiple locations using Category-5 cable.
- Buffered video for connection to local monitor at sender
- Supports resolutions up to 1600x1200 including 1080i
- Rugged, Reliable, Compact size
- Drive standard CAT5 cables to 500 feet
- Transmits video and Power on one Cat5 cable
- Easily expandable by daisy-chaining using local VGA port

2. Installation



Figure 1 – AC600A Front



Figure 2 – AC600 Rear

1. Connect the VGA IN of the AC600A or AC601A to the computer's video port using the supplied cable
2. If desired, connect a local display to the VGA out port of the Transmitter unit.
3. Using Category 5 cables connect the RJ45 ports of the Transmitter to the Model AC602A Receiver.
4. Connect the Remote displays to the VGA output port of the AC602 Receivers.
5. Plug in the supplied Power supply to the Power Input jack of the Transmitter unit.
6. Turn on the local and remote displays, then the PC

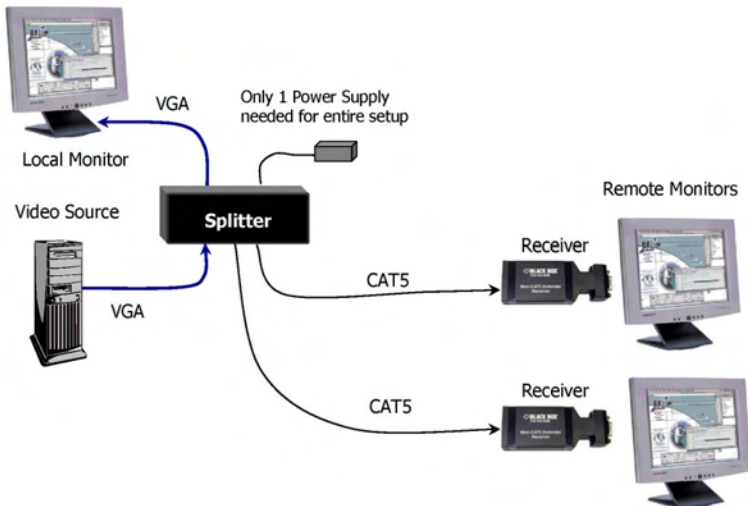





Figure 3 – Setup Block Diagram

NOTES

 If the length of Cat5 Cable is longer than 300 feet you may need to attach a power supply to the receiver unit. The power supply will need to be the same as the sending unit (i.e. 9VDC regulated, Center Positive with 2.5mm connector). If there is no image at the remote or the image is intermittent, you may need a power supply at the receiver, please contact Black Box to purchase one. Generally if the remote display device is referenced to ground (i.e. the VGA connector ground or case, is connected to power line ground) you should not need an additional power supply to the specified maximum length of 500 feet

 Do not connect this unit to any LAN device such as network cards or hubs as this may damage the AC155A and/or the LAN device. Use EIA/TIA 568B standard straight-through patch wiring. Do not use crossover cables.

 For cable runs of 300 feet or longer it is recommended that you use a UTP cable that is optimized for video (low skew cable). We recommend Belden Cable's "Brilliance® VideoTwist(tm)" Category 5 Cable for best results.


 If you want to transmit component video, then contact Black Box to purchase HD15-to-3 RCA adapter cables for the inputs and outputs.



Figure 4 – HD15-to-3 RCA adapter Cable

3. Configuration & Operation

The Model AC602A Mini-CAT5 Receivers are equipped with an adjustment to improve image quality when using long cables. The adjustment is made via a single turn trim-pot located next to the power connector on the side.

When using a long cable, with no compensation, any solid horizontal line, tends to smear to the right. For example in the image shown on the right, observe the dark black line at the bottom of the window and see how it is smearing to the right (not changing to white abruptly as it should). This is the effect of long cable on the signal.

You can turn the trim-pot to eliminate these streaks as shown on the 2nd picture. If you add too much compensation to the signal, then an opposite effect may be observed, i.e. black lines smear to the right as white lines or vice-versa. The 3rd picture shows the case where too much compensation is added.

When using long cables, the image quality is a function of resolution and refresh rate. Lower resolution or refresh rate, result in best picture. Therefore it is best to set the refresh rate to 60 Hz at any resolution.

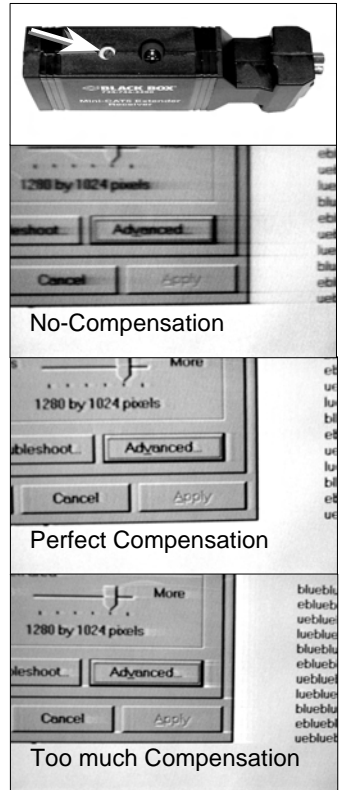


Figure 5

4. Troubleshooting

1. Fuzzy, blurry, or ghosting image at remote location

If you have a stable image but it looks too blurry (object or character edges are smearing), try to adjust the compensation first. See Section 3. If you still have a fuzzy image, try reducing the refresh rate and/or the resolution of the PC. For Best results use either low-skew cable (such as Belden Brilliance® VideoTwist), or Cat5 (instead of Cat6).

2. Shaking image or periodically blanking monitor

The employs CAT5 cable's twisted pairs to differentially transmit the signals, however, a strong electromagnetic noise field can cause instability in the signal. Usual sources of this form of noise coupling are high current AC lines or other high-density data and/or control cables that run adjacent to and parallel with a substantial length of the CAT5 cable.

To eliminate this, either separate the Cat 5 cable of Mini-CAT5 Extender from the interfering source or use shielded CAT5 cables. Note that separating the CAT5 cable from the EMI source by a few inches is often sufficient to eliminate this problem.

If the length of Cat5 run exceeds 300 feet you may need an additional power supply at the receiver (see first note in Section 2)

Contacting Black Box

If you determine that your extender is malfunctioning, do not attempt to repair the unit. Contact Black Box at 724-746-5500. Before you do, make a record of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description.

Shipping and Packaging

If you need to transport or ship your extender:

- Package it carefully. Use the original container if possible.
- Before you shipping the unit, contact us to get a Return Authorization (RA) number.

5. Specifications

(a) Common Specs.

Video Types	RGBHV analog or YPbPr / YCbCr through HD15
Resolution	Up to 1600 x 1200 at up to 85 Hz
Bandwidth	DC to 250 MHz
Max. Distance	Up to 328 ft. (100 m) with Phantom Power, or 500 ft (150 m) with additional power supply at receiver
Connectors	HD15 female for video in and out; Shielded RJ45
Interfaces	Standard Analog VGA; Proprietary CAT5
Compliance	CE; FCC Part 15 Subpart B Class A, IC Class
Max. Altitude	10,000 ft. (3048 m)
Temperature	Operating: 32 to 122°F (0 to 50°C); Storage: -40 to +185°F (-40 to +85°C)
Humidity	Up to 95% non-condensing

(b) Transmitter Specs.

Enclosure	Steel
MTBF	90,000 hours (calculated estimate)
Power	From utility-power (mains) outlet, through included Universal power adapter. Input Voltage: 100~240 VAC Output Voltage: 9v DC regulated Center-Positive at 1.7A Max
Size & Weight	AC600A 1.22"H x 4.86"W x 2.60"D, 1.8 lbs AC601A 1.22"H x 8.20"W x 3.00"D, 2.4 lbs

(c) Receiver Specs. (Model AC602A)

Enclosure	Plastic ABS-94VO, UL File#56070
MTBF	200,000 hours (calculated estimate)
Size	0.8" H x 1.7" W x 4.5" L
Weight	1 lbs.



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