



## Mini-Cat5 Extender Wallplate Transmitter



Transmit VGA, Component Video (YpbPr), or  
Composite Video via UTP Twisted Pair Cable

**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](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)



## Trademarks Used in this Manual

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## FCC and Canadian Dept 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 their 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 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 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.

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# 1. Introduction

## 1.1 General

The AC504A-WP is used to send PC Video or analog HDTV (component video) on UTP (Cat5/5e/6) cables. Power is also transmitted on the same Cat5 cable between the sender unit and the receiver.

The AC504A-WP can extend the video up to 500 feet. The unit can support the following video signals

- PC's VGA video (RGBHV) at any resolution
- Component video (Y Pb Pr, or RGB), at any resolution - an adapter cable HD15-to-3RCA will be required
- NTSC, PAL, or SECAM Composite video and stereo audio -an adapter cable HD15-to-3RCA (video and R/L Audio) will be required

At the receiving (remote) end the Cat5 signal is converted back to VGA for connection to monitors, projector or other display devices using a compatible unit (Black Box Model AC602A).

The AC504A-WP includes a power supply that powers itself and the AC602A Receiver (power-over-UTP) for a clean and easy setup

*(Note that if the length of Cat5 cable is longer than 300 feet, the receiver may require its own power supply).*

Alternatively, the power supply can be connected to the AC602A remote receiver, in which case, the sender is powered through the cat5 cable.

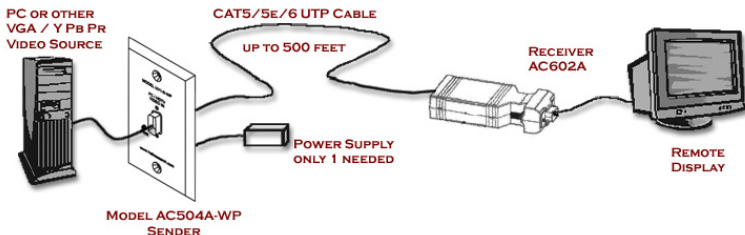


Figure 1 – Connection Block Diagram

## 1.2 Features

- Extends high resolution video with no loss to 500 feet
- Differential signaling eliminates ground loops and noise
- Handles resolutions up to 1600x1200 at any refresh rate
- Slim single gang wall plate design
- Reliable and economical
- Only one end requires power in most applications. Power supply can be connected at the sending or the receiving end, whichever is convenient.
- Drive standard CAT5 cables to 500 feet (for VGA and Component Video) or to 1200 feet (for Composite Video + Audio)
- 

## 2. Installation



Figure 2 – AC504A-WP Front

### 2.1 Setup Connections

1. Connect the VIDEO INPUT to the computer's video port using a male-male VGA cable (not included).
2. Using Category 5 cables connect the RJ45 port of the Transmitter located on rear of the unit to the Model AC602A Receiver (not included).
3. Connect the Remote displays to the VGA output port of the AC602 Receiver.

4. Plug in the supplied Power supply to the Power Input jack on the rear of the sender unit.

On the rear of the unit next to the RJ45 connector, there is a 2 pin screw terminal for power connection.

You need to connect 9 vDC to these terminals.

In your package there is either of the 2 power supplies pictured. There is also a 2.5 mm Jack included in the package so that you don't have to cut the connector at the end of the supply. If you decide to cut off the connector on the end of the power supply, then use the enclosed jack and solder a pair of wires to it and connect those to the AC504A-WP or AC602.



Using the supplied 2.5mm Jack also gives you the ability to place the power supply outside the wall. You can use a separate single gang plate and install the supplied jack on it and wire it to the terminals on the back of the AC504A-WP or AC602.

You can use 20 awg or heavier wire to extend the DC output cord of the power supply if you need to locate the power supply farther from the device. It is recommended to keep the distance of the supply from the unit to within 30 feet.

Note: Please do not connect the power supply to the AC source until you have securely connected the output cords to the Wall Plate Mini-Cat unit.

### Electrical Safety Note

Since the DC supply to the unit is only 9 vDC with minimal current requirements, the product qualifies as a Class 2 low-voltage device, and you are not required to run the DC cables in a conduit.

However if you will be installing the power supply in the wall or ceiling, since it has to plug in to AC, you need an electrical junction box for it, and the AC line that brings high-voltage to the junction-box should follow the electrical code for your specific installation



5. Apply a video source to the system and check for an image at each receiver, then set the compensation Potentiometer (pot) for best possible image.



**Note:** If the source is Component Video (YPbPr) an HD15 to 3 RCA cable will be required for each HD15 connector.

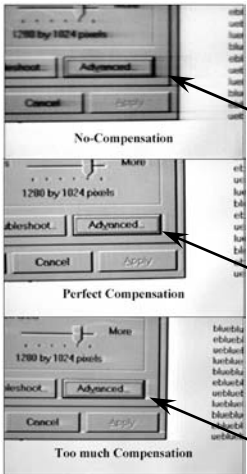
If the source is composite video with stereo audio, a similar cable will be needed. The RCA connectors are typically yellow (instead of green) for video and red/white for audio. To transmit CV and stereo audio, please read section 2.3 below.

## 2.2 Video Compensation Adjustment

If the length of Cat5 cable is long, you need to adjust the receiver (AC602A) to compensate for the signal in order to perfect the image.

Apply a video source to the system and check for an image at each receiver, then set the compensation Potentiometer (pot) for best possible image.

Start with the compensation pot fully CCW (least compensation), then slowly turn it clockwise and check for the bleeding of left to right horizontal lines on the screen.



Note dark line bleeding as a dark line to the right

Note dark line has a clean transition

Note dark line bleeding as a white line to the right!

## **2.3 Configuration for Composite Video and Stereo Audio**

The AC504A-WP can be used to transmit Composite Video and Stereo Audio instead of VGA or YPbPr to the receiver. However since the Video signals are terminated differently than audio, you need to cut or remove two jumpers on the rear of the unit.

For normal operation (VGA or YPbPr), J1 and J2 on the rear of the unit, are installed. For transmitting composite video and audio, you need to remove or cut these jumpers.

An HD15 to 3 RCA cable will be required. The composite video is sent on the green (pin 2), and the light and left audio channels are sent on the Red (pin 1), and Blue (pin 3). Note that some cables may have Yellow (video), Red (right audio), and White (left audio) RCA connectors instead of RGB connectors.

### **NOTES**



**If the length of Cat5 Cable is longer than 300 feet you may need to attach a power supply to the receiver unit. 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.**

## 3. Troubleshooting

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

If you have a stable image but it looks blurry (object or character edges are smearing), adjust the compensation on the receiver. If you still have a fuzzy image, try reducing the refresh rate and/or the resolution setting of the video. 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

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

If the length of Cat5 run exceeds 300 feet you may need an additional power supply at the receiver.

### 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.

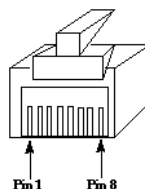
## 4. Specifications

|                      |   |
|----------------------|---|
| <b>Video Types</b>   | VGA through UXGA (RGBHV, or YPbPr), <u>or</u> CV and line level stereo audio  |
| <b>Resolution</b>    | Up to 1600 x 1200 at up to 85 Hz PC or 1080i HDTV   |
| <b>Bandwidth</b>     | DC to 450 MHz   |
| <b>Max. Distance</b> | Up to 328 ft. (100 m) with Phantom Power, or 500 ft (150 m) with additional power supply at receiver for VGA or 1200 feet for CV and audio  |
| <b>Connectors</b>    | HD15 female for video in and out; Shielded RJ45   |
| <b>Interfaces</b>    | Standard Analog VGA; Proprietary CAT5   |
| <b>Compliance</b>    | CE; FCC Part 15 Subpart B Class A, IC Class   |
| <b>Max. Altitude</b> | 10,000 ft. (3048 m)   |
| <b>Temperature</b>   | Operating: 32 to 122°F (0 to 50°C);<br>Storage: -40 to +185°F (-40 to +85°C)  |
| <b>Humidity</b>      | Up to 95% non-condensing  |
| <b>Enclosure</b>     | Aluminum and Steel  |
| <b>MTBF</b>          | 100,000 hours (calculated estimate)   |
| <b>Power</b>         | From utility-power (mains) outlet, through included Universal power adapter. Input Voltage: 100~240 VAC Output Voltage: 9v DC regulated at 1.7A Max (actual power consumption of the sender and the receiver, is 200 ma nominal (1.8 watts) |
| <b>Dimensions</b>    | 2.75" W X 4.5" L X 1" D   |
| <b>Weight</b>        | 0.5 lbs   |

## 5. Appendix

### EIA/TIA 568B WIRING STANDARD

| PIN | Wire Color             |
|-----|------------------------|
| 1   | White w/ Orange Stripe |
| 2   | Orange                 |
| 3   | White w/Green Stripe   |
| 4   | Blue                   |
| 5   | White w/Blue Stripe    |
| 6   | Green                  |
| 7   | White w/Brown Stripe   |
| 8   | Brown                  |









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