CAT5 Multi VGA System
(VGA, Audio and RS-232)
FCC/IC RFI STATEMENTS, EU DECLARATION OF CONFORMITY

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.

EUROPEAN UNION DECLARATION OF CONFORMITY

The manufacturer declares that this product meets the requirements of EU Directive 89/336/EEC.

NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

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 bloquear la ventilación, no se debe colocar en librerías o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deberá 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.
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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</table>
1. Specifications

**Cable Required:** CatX (5/5e/6) UTP

**Compliance:** CE; FCC Class A, IC Class/classe A

**Video Support:** RGBHV, RGB, YUV, S-Video, composite, 75 ohm.

**Audio Support:** 2 channel stereo audio, 600 ohm line level

**Serial Support:** Data rates fixed at 9600 kbps
Protocol is 3 wire TX, RX, GND

**Resolution and Refresh Rate:** (receiver dependent)
- AC1062A-R2: 1920x1080, 1080P;
- AC1062A-DA-R2: 1920x1080, 1080P;
- AC1063A-R2: 1920x1080, 1080P;
- AC1063A-DA-R2: 1920x1080, 1080P;
- AC1064A-R2: 1920x1080, 1080P;
- AC1064A-DA-R2: 1920x1080, 1080P;

See the Maximum Distance specification

**Maximum Distance:** (receiver dependent)
- AC1062A-R2: 600 ft (183 m)
- AC1062A-DA-R2: 600 ft (183 m)
- AC1063A-R2: 1200 ft (366 m)
- AC1063A-DA-R2: 1200 ft (366 m)
- AC1064A-R2: 2000 ft (610 m)
- AC1064A-DA-R2: 2000 ft (610 m)

**Power:** +5 VDC;
Consumption: 5 watts maximum
Brick style IEC corded external power supply

**Temperature Tolerance:** Operating: 32 to 104°F (0 to 40°C);
Storage: -4 to +140°F (-20 to +60°C)

**Humidity Tolerance:** Up to 80% noncondensing

**Enclosure:** Steel
CAT5 MULTI VGA SYSTEM

Connectors:

Transmitters:
AC1060A: (1) DB9F, (1) 4 captive screw, (1) RJ-45, (2) HD15 F;

Receivers:
AC1062A-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
AC1062A-DA-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
AC1063A-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
AC1063A-DA-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
AC1064A-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
AC1064A-DA-R2: (1) DB9M, (1) 4 captive screw, (2) RJ-45, (1) HD15 F;

All: (1) power inlet

Size:

Transmitters:
AC1060A: 1.2"H x 4.1"W x 4.3"D (3.1 x 10.4 x 10.9 cm)

Receivers:
AC1062A-R2: 1.2"H x 5.5"W x 3.6"D (3.0 x 14.0 x 9.2 cm)
AC1062A-DA-R2: 1.2"H x 5.5"W x 3.6"D (3.0 x 14.0 x 9.2 cm)
AC1063A-R2: 1.2"H x 5.5"W x 3.6"D (3.0 x 14.0 x 9.2 cm)
AC1063A-DA-R2: 1.2"H x 5.5"W x 3.6"D (3.0 x 14.0 x 9.2 cm)
AC1064A-R2: 1.2"H x 5.6"W x 6.2"D (3.0 x 14.2 x 15.7 cm)
AC1064A-DA-R2: 1.2"H x 5.6"W x 6.2"D (3.0 x 14.2 x 15.7 cm)

Weight:

Transmitters:
AC1060A: 0.8 lb. (0.4 kg);

Receivers:
AC1062A-R2: 1.0 lb. (0.5 kg);
AC1062A-DA-R2: 1.0 lb. (0.5 kg);
AC1063A-R2: 1.0 lb. (0.5 kg);
AC1063A-DA-R2: 1.0 lb. (0.5 kg);
AC1064A-R2: 2.0 lb. (0.9 kg);
AC1064A-DA-R2: 2.0 lb. (0.9 kg);
CHAPTER 2: INTRODUCTION

2. Introduction

2.1 Overview
The CAT5 Multi VGA System for Video, Audio and RS232 extends video, stereo audio and serial signals over ordinary Category 5 cable. All models support RGBHV, RGB, and VGA video, and they use a transmitter-to-receiver setup.

This manual covers the following CAT5 Multi VGA System Transmitters and Receivers:

Transmitters:
- AC1060A Single port transmitter

Receivers:
- AC1062A-R2 600 ft range (or last in a daisy chain)
- AC1062A-DA-R2 600 ft range, daisy chainable (middle only)
- AC1063A-R2 1200 ft range, (or last in a daisy chain)
- AC1063A-DA-R2 1200 ft range, daisychainable (middle only)
- AC1064A-R2 2000 ft range, (or last in a daisy chain)
- AC1064A-DA-R2 2000 ft range, daisychainable (middle only)

The video/audio/serial models transmit VGA, stereo audio, and RS-232 signals to devices such as monitors that have RS-232 serial inputs and speakers. They do this by transmitting full modem serial signals along with the video signals over CAT5.

CAT5 Multi VGA System receivers are available with single or dual daisychainable connections. The dual daisychainable receiver is used when the same signal is distributed to multiple display devices across a single CAT5 cable in a daisychain or loop-through fashion. Setup and cabling are the same as the single-port receiver.

*Note that units in the middle of the daisy chain must be the AC10xxA-DA-R2 models and each daisy chain must be terminated with an AC10xxA-R2 unit. This is required to terminate the serial signals.*

You can daisy chain within the rated distance of the receiver. For example, an AC1062A-R2 can be daisy chained within 600 ft of the transmitter. It is possible to daisy chain out of a shorter range receiver into a longer range receiver. For example, when daisy chaining over 600 ft, an AC1062A-R2 can be daisy chained to an AC1063A-R2 over 600 ft. up to 1200 ft.

A maximum of 12 units may be daisy chained.

When daisy chaining, serial communication is one way broadcast only. No configuration changes to the units are necessary to do this.
CAT5 MULTI VGA SYSTEM

WARNING
This equipment is not intended for, nor does it support, distribution through an Ethernet network. Do not connect these devices to any sort of networking or telecommunications equipment!

2.2 Package Contents

You should have received the following when ordering a CAT5 Multi VGA System receiver:

• The transmitter or receiver.
• External power supply (100–250 VAC, 50–60 Hz, autosensing) with cord.
• This manual.

2.3 Equipment You May Also Need

• Rackmount Brackets (see Appendix D)
• Serial cable
• Audio cable
• Video cable
• CAT5 cable

2.4 Compatible Cabling

The CAT5 Multi VGA System products are compatible with Cat5/5e/6 data cabling as well as skew free CAT5/5e cabling manufactured for video applications. Note that some skew free Cat5 is specific to a particular vendor and is not compatible with these products. Please ensure any skew free CAT5 cable is non-proprietary prior to purchase/installation.

CAT6 cable, due to the manufacture method, can exhibit much greater skew than standard CAT5/5e and may require skew compensation beyond what the standard product offers.

CAT5/5e/6 cabling for the CAT5 Multi VGA Series must be pinned to the TIA-EIA T568B wiring specification (see Appendix A). We also highly recommend that all CAT5 cables be pre-terminated and tested. Cables terminated on-site or in an existing infrastructure should be tested before use to ensure compliance with the TIA-EIA T568B specification. Using incorrectly terminated CAT5 cables can damage the units.
3. Setup and Installation

3.1 Making the Connections

3.1.1 CONNECTIONS AND SETUP IN GENERAL

This section contains figures showing connections with the specific CAT5 Multi VGA System models. In general, however, the connection and setup procedure at both transmitter and receiver ends is as follows (see sections 3.1.2, 3.1.3 for typical connections and section 3.3 for typical applications):

At the transmitter end:

1. Connect the source video to the CAT5 Multi VGA System transmitter video input port, which is an HD15 connector labeled SOURCE IN.
2. If desired, attach a local monitor via the local monitor port to LOCAL OUT.
3. Make your serial connections using a DB9 cable.
4. Make your audio connections.
   - Connect the audio input to the AUDIO connector Pins 1 (Left Audio +), 2 (ground), 3 (Right Audio +).
4. Connect the CAT5 cable to the transmitter.
5. Apply power on the transmitter. The LED should light and, if there’s a local monitor attached, a video image should appear on the monitor’s screen.

At the receiver end:

1. Connect the VIDEO OUT HD15 connector to the display unit, and attach any serial and audio connections depending on the model of CAT5 Multi VGA System (see Sections 3.1.3 for model-specific connections).
2. Make sure that the CAT5 cable connection(s) from the transmitter are secure.
3. Apply power. The LED should light and video should appear on the display (make sure display is powered ON).
4. For video clarity, see Section 3.2 for individual receiver adjustments.

If there are any problems at either end, see Chapter 4.
3.1.2 TRANSMITTER CONNECTIONS:

Figure 3-1. Transmitter connections on the AC1060A.
3.1.3 RECEIVER CONNECTIONS:

Figure 3-2. Receiver connections on the AC1062A-R2 and AC1062-DA-R2. Note that the AC1062-R2 cannot be used in the middle of a daisy chain.

Figure 3-3. Receiver connections on the AC1063A-R2 and AC1063-DA-R2. Note that the AC1063-R2 cannot be used in the middle of a daisy chain.
3.1.3 Receiver Connections:

Figure 3-4. Receiver connections on the AC1064A-R2 and AC1064-DA-R2. Note that the AC1064-R2 cannot be used in the middle of a daisy chain.
CHAPTER 3: Setup and Installation

3.2 RECEIVER ADJUSTMENTS:

This section details the tuning and adjustments for each receiver. The CAT5 Multi VGA system receivers have a single adjustment to compensate for different Cat5 cable lengths. This EQ process is easy and simple to do and must be done once unless the unit is moved to a different location. Skew compensation is also shown—this does not apply to all receiver units.

3.2.1 AC1062A-xx, AC1063A-xx, AC1064A-xx ADJUSTMENTS

An image utility should be included with the receiver. If it cannot be located, contact Black Box Technical Support.

**NOTE:** TURN KNOB SLOWLY DURING ADJUSTMENT PROCEDURE. Turning too fast may result in missing the proper EQ setting resulting in picture loss.

To Reset EQ and Skew values to 0, remove power, push and hold EQ/Skew Knob in and re-apply power.

1. Push EQ/Skew knob in once so that the R/G/B LED is white (AC1062A-xx, AC1063A-xx) or all three RGB LED’s are on (AC1064A-xx).
2. Turn the EQ/Skew knob clockwise until the shadow next to the black box just disappears. The brightness in the white area should be the same as the white area above and below the black box. The Cable Length LEDs will turn on for indicated cable distances (AC1064A-xx). Starting from zero feet to 600/1200/2000 may take some time. Please continue turning the knob for best picture quality.
3. Press and release EQ/Skew knob until the R/G/B LED (AC1062A-xx, AC1063A-xx) is off or all three RGB LED’s are off (AC1064A-xx).

![Image Adjustment Utility](image)

**Figure 3-5.** Image Adjustment Utility.
3.2.3 Skew Compensation Settings

The AC1062A-xx, AC1063A-xx, AC1064A-xx receivers are available with an optional skew compensation module to adjust for signal timing differences due to differing pair lengths within the CAT5 cable. Using the delay signals, skew may be compensated from 2 to 65 nanoseconds in 2 nanosecond increments on each individual color pair. If skew compensation is required, but the skew comp module is not installed, call for technical assistance.

An image file is available to assist in these settings. See Figure 3-6 for an example.

1. To adjust individual colors, press the EQ/Skew knob until the desired color LED is on for the R/G/B LED (AC1062A-xx, AC1063A-xx) or the desired color LED is lit (AC1064A-xx). The LED color corresponds to the color channel being adjusted.
2. Using the image utility, turn knob to add/subtract delay timing until a single vertically aligned line of red, green, blue is obtained.
3. When complete press EQ/Skew knob until R/G/B LED (AC1062A-xx, AC1063A-xx) is off or all LED’s are off (AC1064A-xx).

Not all colors will have the same delay settings.

Cable Skew Compensation Setting Utility
Adjust skew equalizers to align Red, Green and Blue lines so they are stacked one on top of the other. Next, check white and black lines. Make fine adjustments until there is a minimum of color fringing.

Figure 3-6: Image Adjustment Utility—Skew
3.3 TYPICAL APPLICATIONS
Figures 3-9 to 3-11 show typical applications:

**Figure 3-7. Point to Point Application**

**Figure 3-8. Daisy Chain Distribution**
4. Troubleshooting

4.1. Common Problems

In most cases, nearly every issue with the CAT5 Multi VGA System can be resolved by checking the CAT5 termination and making sure that it's pinned to the TIA/EIA 568B wiring specification. However, there may be other problems that cause the system to not perform as it's designed. Below are solutions to the most common installation errors.

**Problem:** No video signal at the transmitter local port or at the receiver.

**Solution:**
- Check that both units are powered.
- Make sure the CAT5 cable is terminated correctly per the TIA/EIA 568B wiring specification.
- Is the display device powered on and functioning?

**Problem:** Video signal is poor.

**Solution:**
- Have all receiver settings been finished (see sections 3.4).
- Check all cable connections.
- The video signal's refresh rate may be set too high. Reset to a lower refresh rate in your monitor-configuration menu.
- There may be a delay skew issue. Call Technical Support.

**Problem:** Audio is poor.

**Solution:**
- Powered speakers are required. Make sure speaker power is ON.
- Check input source levels from the source device. Make sure the audio source is not overdriven or underdriven.

**Problem:** Serial communication doesn't work correctly.

**Solution:**
- Are the serial devices connected properly? Are the serial parameters correct for source/destination devices?
- Are the serial cables terminated correctly? If a null-modem cable is used, it must be placed at the receiver end.
- When using daisy chain receivers, the serial signal is a unidirectionally broadcast mode only. In this mode, all other CAT5 Multi Video System devices must be the simplex serial type. No configurations changes are necessary.
- The last device in a daisychain configuration must be a standard receiver unit with a terminated serial board.
Problem: “Green shift” or “green washout” on multimedia signals.
Solution: Please contact Technical Support. The standard video/serial model is designed to function with DC coupled signals in which the black level is referenced to 0 volts. Nearly all VGA cards function this way. Some media servers, however, provide AC coupled signals and can cause a green color shift in the video. This is a result of the sync clamping on the red and blue channels of the video/serial model. For five-component (RGB/H&V) AC coupled video, the AC1004AR2 and single port transmitters have optional DC restoration circuitry that is easily enabled via a dipswitch setting (see Appendix B).

Problem: Notes on Daisy Chaining:
Solution: When daisy chaining, the maximum cable distance is not increased beyond the rated distance of the receiver used. For example, an AC1062A-R2 can daisy chain within 600 ft of the transmitter. It is possible to daisy chain out of a short range receiver into a longer range receiver. For example, over 600 ft an AC1062A-R2 can be daisy chained into an AC1063A-R2 which allows for daisy chaining to 1200 ft. A maximum of 12 units may be daisy chained together. If a unit in the middle of the chain loses power or is disconnected from the chain, all units beyond this point will lose signals. Note that the middle units must have 4th pair termination off, and the last unit must have 4th pair termination on. See Appendix E. Note that units in the middle of the daisy chain must use the AC10xxA-DA-R2 models and each daisy chain must be terminated with an AC10xxA-R2 unit. This is required to terminate the serial signals.

4.2 Calling Black Box
If you determine that your CAT5 Multi VGA System is malfunctioning, do not attempt to alter or repair it. 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.

4.3 Shipping and Packaging
If you need to transport or ship your CAT5 Multi VGA System:
• Package it carefully. We recommend that you use the original container.
• If you are shipping the CAT5 Multi VGA System 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.
Appendix A. Cabling Pinouts

Table A-1. HD15 video connector.

<table>
<thead>
<tr>
<th>Pin</th>
<th>RGBHV (VGA)</th>
<th>RGBS</th>
<th>RGsB</th>
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<tbody>
<tr>
<td>1</td>
<td>Red +</td>
<td>Red +</td>
<td>Red +</td>
</tr>
<tr>
<td>2</td>
<td>Green+</td>
<td>Green+</td>
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<tr>
<td>3</td>
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<td>11</td>
<td>Gnd</td>
<td>Gnd</td>
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<td>14</td>
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<tr>
<td>15</td>
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Table A-2. Phoenix Connection

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<tr>
<th>PIN</th>
<th>Transmitter Audio*</th>
<th>Receiver Audio</th>
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<tbody>
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<td>Pin 1</td>
<td>Left Channel</td>
<td>Right Channel</td>
</tr>
<tr>
<td>Pin 2</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Right Channel</td>
<td>Left Channel</td>
</tr>
<tr>
<td>Pin 4</td>
<td>—</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Typically Channel 1 is left audio and Channel 2 is right audio.  
*RECEIVER units use Channel 1 for Right audio and channel 2 for Left audio.  
*TRANSMITTER units use Channel 2 for Right audio and channel 1 for Left audio.
### Appendix A. Cabling Pinouts

#### Table A-3. Serial connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>3 wire</th>
<th>Simplex</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RX</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TX</td>
<td>TX</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Table A-4. T568B CAT5 pinout

**T568B CAT5 Specification**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orange/White</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Orange</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Green/White</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Blue</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Blue/White</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Brown/White</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Brown</td>
<td>4</td>
</tr>
</tbody>
</table>

Cabling must be the same on both ends.

Use for Cat5/5e/6.
Appendix B. DC Restoration of AC coupled source

The Cat5 Multi VGA system is designed to function with DC coupled signals with the black level referenced to 0 volts. Nearly all VGA cards function this way. However, some media servers or digital camera devices provide AC coupled signals and can cause a green color shift in the video. This is a result of the sync clamping on the Red and Blue channels. The single port transmitter has been designed with full DC restore capability. A simple switch setting is all that is required.

The following diagrams show the switch location and settings for the AC1060A transmitter assembly.

*Note: Switch settings other than shown below may result in unpredictable performance and are not supported by Black Box.*

DC restore option (AC1060A-R2 only):
- Mode 1 Enable: Switch position B, C ON (UP)
- Mode 2 Enable: Switch position A, C ON (UP)
- Disable: Switch position B, C OFF (default)
Appendix C. Receiver Video Modes

The Cat5 Multi VGA System receivers feature the ability to display five component RGBHV computer video as well as RGS, RGSB and full component RGB video. The transmitter units need no configuration changes.

The AC1062A-xx, AC1063A-xx, AC1064A-xx feature an auto-sense mode to determine RGBHV or not is in use. This mode can be overridden if necessary as shown below:

**Figure C-1. Auto Sync Modes AC1062A-xx, AC1063A-xx**

**AUTO SYNC MODES:**
JP8 controls sync clamping circuitry and works with the external switch labeled AUTO CLAMP.

The default sync mode is AUTO CLAMP OFF which will autosense between RGBHV and non-RGBHV signals.

Turning the External AUTO CLAMP switch ON will set the sync clamp mode to RGBHV video modes

If non-RGBHV video is desired with AUTO CLAMP ON, jumper JP8 must be set to IN.

**Figure C-2. Auto Sync Modes AC1064A-xx**

JP13 controls sync clamping circuitry and has 3 settings depending on the video signal in use:

- RGBHV computer video with separate horizontal and vertical sync: Jumper JP13 to positions 1-2
- Non RGBHV video, component RGB/YUV, S-video, composite video or RGSB video: Jumper JP13 to positions 2-3
Appendix D. Rackmounting Units

The Cat5 Multi VGA System components can be rack mounted in 19" wide cabinets. Below is a table showing the various rackmount kits available. Figure D-1 shows a typical rackmount application.

Transmitters:

<table>
<thead>
<tr>
<th>PN</th>
<th>Rackmount PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1060A</td>
<td>AC1009</td>
<td>19&quot; 1U high kit for 4 units horizontally.</td>
</tr>
<tr>
<td></td>
<td>AC1010</td>
<td>19&quot; 2U high kit for 2 rows of 4 units</td>
</tr>
</tbody>
</table>

Receivers:

AC1062A-xx, AC1063A-xx, AC1064A-xx

<table>
<thead>
<tr>
<th>PN</th>
<th>Rackmount PN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1009</td>
<td>AC1009</td>
<td>19&quot; 1U high kit for 3 units horizontally.</td>
</tr>
<tr>
<td></td>
<td>AC1010</td>
<td>19&quot; 2U high kit for 2 rows of 3 units</td>
</tr>
</tbody>
</table>

Figure D-1. Mounting with the AC1009 kit.