CAT5 Multi VGA System
(VGA, Audio/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**

**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, sofá 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 se recomienda 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 livreros 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 pelizados 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 equipo 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 USED IN THIS MANUAL**

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

**Cable Required:** Between transmitter and receiver(s): Category 5 shielded or unshielded twisted pair (STP or UTP)

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

**Video Support:** VGA, SVGA, XGA, XGA-2, RGBHV, RGB

**Resolution and Refresh Rate:**
- At 500 ft. (137.2 m) or less: Up to 2048 x 1536 at up to 75 Hz;
- See the Maximum Distance specification

**Transmission:** Transparent to users (automatic, no delay)

**Required Source Impedance:**
- Video OUT: 75 ohms;
- Audio OUT (if any): 600 ohms maximum

**Destination Impedance:**
- Video IN: 75 ohms;
- Audio IN (if any): 600 ohms minimum

**Bandwidth:**
- Video (3 dB): DC to 8 MHz
- Audio AC1001A-LR, AC1002A-R2 only:
  - Channels: Monaural (mono);
- Serial AC1005A-R2, AC1007A only:
  - Protocol: Asynchronous; transparent to data format; transparent to data rates up to 19.2 kbps;
  - Operation: AC1004AR2–AC1005A: Simplex or full duplex, user-selectable;
  - AC1006A-R2, AC1007A: Simplex (broadcast) only

**Maximum Total end to end, from source device to farthest destination device, over good CAT5 cable (assuming A/V source outputs signal at normal strength):**
- Up to 500 ft. (152 m) at resolutions up to 2048 x 1536 at up to 75 Hz;
- Connectors:
  - AC1001A-LR: (1) 4 captive screw, (1) RJ-45, (1) HD15 F;
  - AC1002A-R2: (1) 4 captive screw, (2) RJ-45, (1) HD15 F;
  - AC1005A-R2: (1) DB9 M (DTE), (1) RJ-45, (1) HD15 F;
  - AC1006A-R2: (1) DB9 M (DTE), (2) RJ-45, (1) HD15 F;
  - All: (1) power inlet

**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

**Power:** From utility-power (mains) outlet to power inlet, through detachable external power supply: Input: 100 to 250 VAC @ 50 or 60 Hz (autosensing);
- Output: +5 VDC;
- Consumption: 5 watts maximum

**Size:** 1.2”H x 4.1”W x 5.5”D (3.1 x 10.4 x 14.0 cm)

**Weight:** 1.0 lb. (0.45 kg) (all units)

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2. Introduction

### 2.1 Overview

The CAT5 Multi VGA System extends VGA video signals over ordinary Category 5 cable. All models support RGBHV, RGB, and VGA video, and they use a transmitter-to-receiver setup. They can be used as video splitters as well as video extenders.

This manual covers CAT5 Multi VGA System Receivers with Audio (AC1001-LR AC1002A-R2) and CAT5 Multi VGA System Receivers with RS-232 (AC1005A-R2, AC1006A-R2). Their respective Rackmount Kits are discussed in Appendix D.

The video/audio models enable you to broadcast line-level mono audio, along with video from your computer, to as many as 100 computer monitors up to 500 feet (152 m) away over CAT5.

The video/serial models transmit VGA signals at the same 500-ft. distance to RS-232 devices, such as touchscreen displays or newer plasma monitors that have RS-232 serial inputs.

When using the quad hub serial transmitter model (AC1003A) with daisychained receivers, serial communication mode is unidirectionally broadcast. In this mode, all other CAT5 Multi VGA System devices must be of the simplex serial type.

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.

All models support refresh rates/resolutions up to 2048 x 1536 @ 75 Hz at up to 500 feet (152 m).

**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 receiver.
- External power supply (100–250 VAC, 50–60 Hz, autosensing) with cord.
- This manual.
2.3 Equipment You May Also Need

• Rackmount Brackets:
  For or single-port/dual daisychainable receivers:
  AC1011 for 3 units; AC1012 for 6 units;
• Audio cable with RCA jacks.
• Video cable with HD15 connectors.
• Serial cable with DB9 connectors.
• CAT5 cable.
• For the single-port audio models, an audio splitter.

2.4 Compatible Cabling

CAT5 cabling for the CAT5 Multi VGA System must be pinned to the TIA-EIA T568B wiring specification. 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 CAT5 Multi VGA System.

3. Setup and Installation

3.1 Data Mode Configuration

For 1-port versions only: Configure the internal Universal Digital Board (UDB) if you want to change the transmitters/receivers from simplex operation (default) to bidirectional operation. (See Appendix C.) This configuration should be done before making any cable connections and applying power.

3.2 Cabling Considerations

• We recommend mounting and connecting all cabling to the CAT5 Multi VGA System components before applying power.
• Make sure that the CAT5 cable you intend to use has been tested to comply with the TIA/EIA 568B wiring specification.

3.3 Making the Connections

3.3.1 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:

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 audio or serial connections.

   For audio versions: Connect the audio input to the AUDIO connector Pins 1 (Left Audio +), 2 (ground), 3 (Right Audio +)
   For RS-232 versions: Connect the serial input to the RS-232 (DB9 female) port.
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 SOURCE OUT HD15 connector to the display unit, and attach any audio or serial connections depending on the model of CAT5 Multi VGA System (see Sections 3.3.2 through 3.3.5 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, adjust the EQ compensation knob, which optimizes the image for the length of CAT5 cable used. Counter clockwise is zero feet of cable and clockwise is 500 ft of cable. Turn knob slowly to ensure display has time to sync up.

NOTE

The single-port units with audio have a single audio input. So, for audio capabilities on the attached monitor, you’ll need an audio splitter.

3. Make your audio or serial connections.

   For audio versions: Connect the audio input to the AUDIO connector Pins 1 (Left Audio +), 2 (ground), 3 (Right Audio +)
   For RS-232 versions: Connect the serial input to the RS-232 (DB9 female) port.
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 SOURCE OUT HD15 connector to the display unit, and attach any audio or serial connections depending on the model of CAT5 Multi VGA System (see Sections 3.3.2 through 3.3.5 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, adjust the EQ compensation knob, which optimizes the image for the length of CAT5 cable used. Counter clockwise is zero feet of cable and clockwise is 500 ft of cable. Turn knob slowly to ensure display has time to sync up.
5. If necessary, adjust one or two (never all three) of the skew compensation switches to add a 10ns delay for that color. This may be necessary for Cat6 cables or cat5/5e cables in the 400 to 500 ft range.

If there are any problems at either end, see Chapter 4.

### 3.3.2 CONNECTIONS ON THE SINGLE-PORT VGA/AUDIO

The single-port units with audio support video and audio signals over CAT5 cable. The audio signal is line-level audio, and powered speakers are required. Note that there’s a single connection for audio input. If you use a local station, you’ll need an audio splitter for that jack. (For more information, call Technical Support.) You can also use the transmitters and receivers to make video-only connections without mono audio.

Figure 3-1 shows the Single-Port CAT5 Multi VGA System with Audio Transmitter connections, and Figure 3-2 shows the receiver connections.

![Figure 3-1. Transmitter connections on the AC1000AR2.](image)

![Figure 3-2. Receiver connections on the AC1001A-LR.](image)

### 3.3.3 CONNECTIONS ON THE SINGLE-PORT VGA/RS-232

The Single-Port CAT5 Multi VGA System with RS-232 supports video and full-modem serial (RS-232) signals over CAT5 cable. You can also use the transmitters and receivers to make video-only connections without serial communications. Figure 3-3 shows the Single-Port CAT5 Multi VGA System with RS-232 Transmitter connections, and Figure 3-4 shows the receiver connections.

**NOTE**

Even though both transmitter and receiver units contain audio jacks, audio is not supported on the RS-232 version. Plugging in audio cables will interfere with the RS-232 serial communications.

![Figure 3-3. Transmitter connections on the AC1004AR2.](image)

![Figure 3-4. Receiver connections on the AC1005A-R2.](image)
CHAPTER 3: Setup and Installation

3.3.4 CONNECTIONS ON THE DUAL DAISYCHAINABLE VGA/AUDIO RECEIVER OR DUAL DAISYCHAINABLE VGA/RS-232 RECEIVER

The dual daisychainable receiver is used when the same signal is distributed to multiple display devices on a single CAT5 cable in a daisychain or loop-through fashion.

Setup and cabling are the same as the single-port receiver, but the dual daisychainable model has an additional RJ-45 connector for linking to another dual daisychainable receiver or single-port receiver.

Figure 3-7 shows how connections are made on the dual daisychainable receiver with audio, and Figure 3-8 shows how connections are made on the dual daisychainable receiver with RS-232.

3.3.5 A TYPICAL SINGLE-PORT TRANSMITTER–RECEIVER APPLICATION

Figure 3-9 shows a typical application in which the single-unit transmitter is connected over CAT5 to a single-unit receiver. Although the figure shows optional audio and RS-232 connections, no model supports both audio and RS-232 communications. You can use the audio or RS-232 units as video-only transmitters/receivers, too.

Figure 3-7. Transmitter to receiver connections.
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?
  In some cases, the video termination may be mismatched. The transmitters and receivers ship with 75-ohm termination as the default. To disable termination, see Appendix B.

**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.
- If using mono audio, both right and left channels must be connected at the transmitter as signals are summed. Using only a single will result in 1/2 of audio signal at receiver.

**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 RS-232 transmitters or receivers, the serial signal is a unidirectionally broadcast mode only. In this mode, all other CAT5 Multi VGA System devices must be the simplex serial type. For assistance, contact Technical Support.
- The last device in a quad hub or 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 AC1000AR2 and AC1004AR2 single port transmitters have optional DC restoration circuitry that is easily enabled via a dipswitch setting (see appropriate manual).

Quad hub transmitters (AC1003A, AC1007A) require an AC100AR2 installed prior to the Quad hub using the local monitor output in order to enable DC restoration.

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>
</tr>
</thead>
<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>
<td>Green+</td>
</tr>
<tr>
<td>3</td>
<td>Blue+</td>
<td>Blue+</td>
<td>Blue+</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Gnd</td>
<td>Gnd</td>
<td>Gnd</td>
</tr>
<tr>
<td>6</td>
<td>Red-</td>
<td>Red-</td>
<td>Red-</td>
</tr>
<tr>
<td>7</td>
<td>Green-</td>
<td>Green-</td>
<td>Green-</td>
</tr>
<tr>
<td>8</td>
<td>Blue-</td>
<td>Blue-</td>
<td>Blue-</td>
</tr>
<tr>
<td>9</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>Gnd</td>
<td>Gnd</td>
<td>—</td>
</tr>
<tr>
<td>11</td>
<td>Gnd</td>
<td>Gnd</td>
<td>—</td>
</tr>
<tr>
<td>12</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>13</td>
<td>H Sync</td>
<td>C Sync</td>
<td>—</td>
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<tr>
<td>14</td>
<td>V Sync</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>15</td>
<td>Gnd</td>
<td>Gnd</td>
<td>—</td>
</tr>
</tbody>
</table>

### Table A-2. AUDIO connector

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

### Table A-3. DB9 Male Serial connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Full Duplex</th>
<th>3 wire</th>
<th>Simplex</th>
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<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RX</td>
<td>RX</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TX</td>
<td>TX</td>
<td>TX</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>DSR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>RI</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>4</td>
</tr>
<tr>
<td>5</td>
<td>Blue/White</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Brown/White</td>
<td>2</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: Sync Termination

Appendix B. Setting Sync Signal Output Termination

In some cases, it may be necessary to disable the 75-ohm termination of the video outputs on the CAT5 Multi VGA System units. This can be done by opening the case of each unit and installing jumpers on the circuit board. The settings disable/enable the 75-ohm termination on individual units. For instance, changing a transmitter termination affects the local monitor port only; it doesn’t affect the receivers. Conversely, changing a receiver affects the output port of the receiver, not the transmitter. The following diagrams show the jumper locations for each type of assembly reference the transmitter manual for transmitter settings.

Figure B-1. Receiver termination settings

APPENDIX C. Serial Encoder/Decoder Daughterboard Settings

The single-port serial transmitters and single-port and dual daisychainable serial receivers contain an internal encoder/decoder daughterboard that can be reconfigured from its simplex operation default setting for bidirectional operation.

The encoder/decoder daughterboard hardware configuration is done via jumper settings. These jumpers are used to set the various modes of operation.

Encoders are installed in transmitters and decoders are installed in receivers.

To access the Encoder/Decoder daughterboard on transmitters and receivers:

1. Make sure the unit is powered OFF
2. If necessary, unplug all cables to the unit.
3. Unscrew the top screw as well as the two set screws in the DB2 connector. Lift the cover off

For reference Table C-1 shows the input/output jumper configurations for transmitter.

Table C-1. Transmitter SDB settings
APPENDIX C: Serial settings

APPENDIX C. Serial Daughterboard (SDB) Settings, cont

Table C-2 shows the Receiver SDB configuration settings.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Type</th>
<th>Baud (Max)</th>
<th>JP1</th>
<th>JP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simplex (one way)</td>
<td>115k</td>
<td>1-2 See Notes</td>
<td>3-4 OUT</td>
</tr>
<tr>
<td></td>
<td>(to 1500 ft)</td>
<td></td>
<td>5-6 IN</td>
<td>7-8 OUT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9-10 OUT</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Full Duplex (2 way)</td>
<td>19.2k</td>
<td>1-2 See Notes</td>
<td>3-4 OUT</td>
</tr>
<tr>
<td></td>
<td>Short (&lt; 500 ft)</td>
<td></td>
<td>5-6 OUT</td>
<td>7-8 OUT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9-10 OUT</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Full Duplex (2 way)</td>
<td>19.2k</td>
<td>1-2 See Notes</td>
<td>3-4 See Notes</td>
</tr>
<tr>
<td></td>
<td>Long (to 1500 ft)</td>
<td></td>
<td>5-6 OUT</td>
<td>7-8 IN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9-10 OUT</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Half Duplex (2 way)</td>
<td>115k</td>
<td>1-2 See Notes</td>
<td>3-4 See Notes</td>
</tr>
<tr>
<td></td>
<td>Long (to 1500 ft)</td>
<td></td>
<td>5-6 IN</td>
<td>7-8 IN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9-10 OUT</td>
<td></td>
</tr>
</tbody>
</table>

Table C-2. Receiver SDB jumper settings

Notes:
- **Mode 1** is required when using multi output transmitters and when daisy chaining receivers.
- **Mode 3** may introduce noise in video over 1,000 ft when serial communication occurs.
- JP1 1-2 and 3-4 terminate the serial bus and must be IN on the last receiver in a daisy chain or if using a point to point link.

Appendix D. Rackmounting Units

The Rackmount Kits include brackets for mounting a single transmitter, single receiver, or a single dual daisychainable receiver. Figure E-1 shows the 1-Unit Rackmount Bracket (AC1008), which can be used to mount a single CAT5 Multi VGA System unit on a wall. Figure E-2 shows the 4-Unit Rackmount Bracket (AC1009), which holds four units in a 19" x 1U rack.

Not shown are brackets for 8 units and brackets for quad hub transmitters. The 8-Unit Rackmount Bracket (AC1010) holds the mounted units like the 4-Unit Rackmount Bracket (AC1009) but is 2U high instead of 1U high, stacking 4 slots directly above 4 slots. The 3-Unit Quad Hub Transmitter Bracket (AC1011) is like the AC1009 but holds 3 units instead of 4 in a 19" wide x 1U high panel. The 6-Unit Quad Hub Transmitter Bracket (AC1012) is like the AC1011 but occupies 2U of space instead of 1U in a 19" rack, stacking 3 quad hub transmitters atop 3 quad hub transmitters.

Figure E-1. Mounting with the AC1008 kit.

Figure E-2. Mounting with the AC1009 kit.