

## ServSwitch Brand CATx KVM Extenders

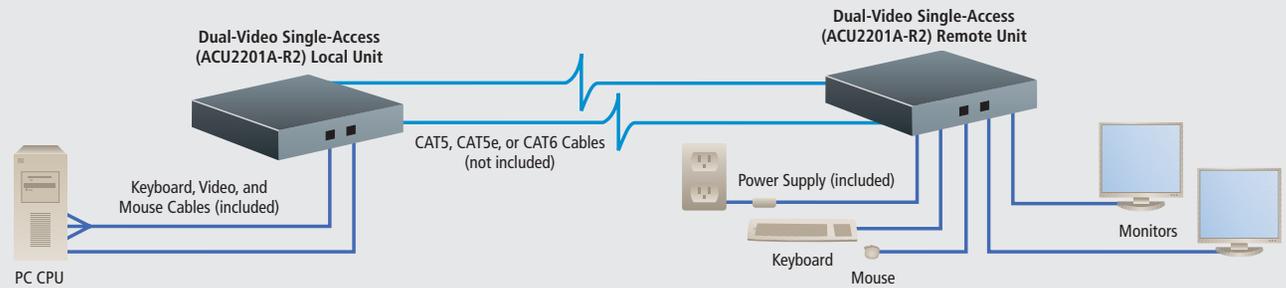


**Extend KVM signals over twisted-pair cable without sacrificing video clarity!**

## FEATURES

- Skew compensator on all remote units.
- Support high video resolutions at long distances.
- Work over CAT5, CAT5e, and CAT6.
- Single-access and dual-access kits available.
- Serial extenders also send serial port data.
- Intelligent keyboard and mouse emulation.
- Remote units are compatible with many other ServSwitch Extenders.
- Dual-video models support multi-graphic card systems.

*The dual-video versions support multicard systems and are ideal for extending multimedia over CAT5, CAT5e and CAT6 cable for two users to view.*



## OVERVIEW

Transmit high-resolution graphics over greater distances with ServSwitch™ Brand CATx KVM Extenders.

As with many of the other great products in our ServSwitch Extender family, these extenders enable you to put more distance between your PS/2® style server or CPU and your keyboard, monitor, and mouse (KVM) workstation. With these extenders, you get a maximum distance of 984.3 feet (300 m) between the server/CPU and the KVM station.

And you don't need any special cabling for the extender connections—standard CAT5, CAT5e, and CAT6 twisted-pair cabling will do just fine, hence, the "x" in the product's name. The extender kits include local and remote units that are connected with a single CAT5 or higher cable that carries all video and data signals between the units. All KVM signals (as well as serial and audio signals on models that support them) are fully buffered to ensure consistent remote operation of your PC.

### Pleasing to the eye.

What's most unique about these extenders is that they bring greater clarity to what you see on your monitor. That's because the remote unit (sold as part of a kit or as an add-on to many of our other ServSwitch Extenders) features deskewing technology; this equalizes video colors so you get sharp and clear video at the remote end. Video resolutions include 1600 x 1200 @ 656.2 ft. (200 m) and 1280 x 1024 @ 984.3 ft. (300 m).

The technology does this by addressing a problem frequently seen with higher grades of UTP cable, on longer cable runs, and on high-resolution monitors: color drift or color split. Color drift shows up as that annoying colored shadow you occasionally see around objects on a video screen. It sometimes happens with UTP cable because the pairs of wire

in the cable are twisted at slightly different rates to reduce crosstalk between pairs. Because of these differences between wire pairs, video signals for different colors often travel different distances before they reach the remote receiver. When one color signal arrives behind the others because its wire is longer, you get that red, blue, or green shadow around the objects on your video screen.

ServSwitch Brand CATx KVM Extenders remove color drift by delaying some color signals to compensate for differences in wire pairs. Skew compensation occurs on all video channels and colors, resulting in a maximum compensation of 42 ns, which is sufficient for most applications. This skew compensation works with all colors transmitted. Even higher resolutions don't show visible degradation at great distances.

Such clarity means you can run multimedia presentations over greater distances without having to settle for less-than-optimal viewing. We even offer dual-video extender versions that support multivideo graphics card systems and enable you to set up a multimedia presentation that can be enjoyed by more than one user.

### Easy to configure and adjust.

The extenders are easy to operate and require no software. Video tuning and configuration can be done by entering simple commands on a keyboard that's attached to the system's remote unit. All it takes is a hotkey sequence and you're in Command Mode, where you can configure modes of operation and adjust video for any or all video channels. The ability to tune adjustments on all video channels simultaneously is especially helpful when setting up the multihead versions, which have almost identical cable lengths.

The extenders feature independent low-frequency (LF) and high-frequency (HF) equalization (EQ) adjustment so you can fine-tune the video to match your cable type. Tweaking the LF EQ removes video “smear,” and adjusting the HF EQ sharpens the image.

The remote units also have built-in Assisted EQ, Channel 0, and Quick Skew features that can save you time during the video-tuning process and make it nearly automatic.

Assisted EQ steps through a table of preset LF and HF EQ values for different cable lengths in 25-meter increments, quickly setting the approximate EQ for a selected video channel.

Use the Channel 0 feature to compensate for cable skew on all channels simultaneously. It’s particularly useful in setting up large multihead installations where the required adjustments are always the same. We even offer a test card to help you adjust the skew—just download a copy of the card from our Web site.

Quick Skew is a one-step skew-elimination function that sets the color delay to the value that most installations typically require. Once it’s set, you can fine-tune the delay further to your liking. And, often, all it takes is to use Quick Skew on green.

All settings for the ServSwitch Brand CATx KVM Extender can be stored in EEPROM memory, so you only need to set up the system once, and the settings are automatically restored at power up.

Because the extenders perform full PS/2 keyboard and mouse emulation, you can boot the PC without having a keyboard or mouse attached to it. The extenders are also compatible with Microsoft® IntelliMouse® and other wheel mice.

#### **Various kits are available.**

Our ServSwitch Brand Single-Access CAT5x KVM Extender Kit (ACU2001A) performs basic KVM extension and features skew compensation.

With the dual-access model (ACU2009A), you can attach an additional monitor, keyboard, and mouse to the local unit, and then operate the PC from either the local or remote user station. These stations share access on a “first-come, first-served” basis. You can even use a standard PS/2 mouse at one user station and an IntelliMouse at the other.

The dual-access local units feature an Enhanced Private Mode, too. In this mode, a local user can disable the remote unit or vice-versa.

We also offer models with serial extension and bidirectional stereo audio extension. These kits, offered as a single-access version (ACU2022A) and a dual-access version (ACU2028A), enable you to attach a remote station with a serial device and place audio devices up to 984.3 feet (300 m) from the CPU. These extenders contain boards that enable bidirectional stereo audio and full duplex serial data to be sent along with the KVM signals across the twisted-pair cabling.

For the serial interface, no setup or adjustments are required. It transmits six signals (three in each direction). The audio interface is designed to receive the output from a sound card (or other line-level) source and be connected to a set of powered speakers at the other end of the link. With the audio versions, you can transmit stereo audio either way across the link. You can even plug a microphone into the remote units.

To add a second video channel to your system, order a dual-video version (ACU2201A-R2 or ACU2209A) and get the same high resolution and skew compensation on both channels. If you want a dual-video version that also has serial and audio capabilities, order the ACU2222A-R2 or ACU2228A extender kit.

As with the single-video models, the dual-video extender kits use a single CAT5 or higher UTP cable for transmitting video signals. The dual-video versions, however, use two copper cables for video channel interconnects. The first cable plugs into Port 1 on both local and remote units and carries the primary KVM video signal; the second cable links Port 2 on the local and remote unit and carries the secondary video signal.

#### **Or upgrade your existing ServSwitch Extender remote unit.**

If you’re already using a ServSwitch Brand CAT5 Extender and want to enhance your video capabilities with skew compensation, just order a ServSwitch Brand CATx KVM Extender Remote Unit to replace your existing remote unit. These standalone units feature easy-to-adjust skew compensation and are compatible with many of our ServSwitch Brand CAT5 Extender products.

Which extender remote unit will work with the extender you have? Our standard extender remote units (ACUR001A–ACUR002A, ACUR004A) work with the following:

- Rackmount ServSwitch Brand CAT5 Extender Hubs (ACU1006RA, ACU1012RA, ACU1006DRA)



ACU2009A

And order a ServSwitch Brand CATx KVM Extender Remote Unit with Audio and Serial capabilities (ACURA001A–ACURA002A, ACURA004A) if you have one of the following:

- Rackmount ServSwitch Brand CAT5 KVM Extender Hub with Serial and Bidirectional Stereo Audio (ACU1006VRA, ACU1006DVRA)
- The ACUR004A and ACURA004A are the Quad-Video versions. For details, call our FREE TECH SUPPORT.

*NOTE: This list of compatible products is subject to change depending on additions and deletions in the ServSwitch Extender line. For the most up-to-date information, call our FREE Tech Support.*

## TECH SPECS

**Serial Interface on ACU2022A, ACU2028A, ACURA001A, ACU2222A-R2, ACURA002A:**

**Baud Rate (Maximum)** — 19,200

**Data Format** — Format independent

**Flow Control** — RTS, CTS, DTR, DSR sent across link

**Connectors** — Local unit (DCE): (1) DB9 F;  
Remote unit (DTE): (1) DB9 M

**Audio Interface on ACU2022A, ACU2028A, ACURA001A, ACU2222A-R2, ACURA002A:**

**Input Impedance** — 47 K $\Omega$

**Microphone Support** — A mic can be connected to the remote unit; pull-up resistor provides bias for condenser mic; amplification can be set to +17 dB

**Signal Levels** — Line-level (4 volts peak-to-peak maximum)

**Transmission Method** — Digitized virtual CD quality (16-bit, 38.4-kHz)

**Connectors** — Local unit: (2) 3.5-mm stereo jacks (line in and line out);  
Remote unit: (2) 3.5-mm stereo jacks (line in/mic in and line out)

### General:

**Clamping Voltage** — 15 volts

**Color Skew (Maximum)** — 42 ns

**Color Step Width** — 2.8 ns

**Compatibility** —

Keyboard: PS/2, PC/AT (with optional AC244A and FA222-R2);

Video: VGA, Super VGA, XGA;

Mouse: PS/2 mouse only (user)

**Resolution (Maximum)** — 1600 x 1200, 60 Hz at 656.2 ft. (200 m) and 1280 x 1024, 75 Hz at 984.3 ft. (300 m); higher resolutions may be possible at shorter distances

**Connectors** — ACU2001A: (2) 6-pin mini-DIN F, (1) HD15 M, (1) RJ-45;  
ACU2009A: (4) 6-pin mini-DIN F, (1) HD15 M, (1) HD15 F, (1) RJ-45;  
ACUR001A: (2) 6-pin mini-DIN F, (1) HD15 F, (1) RJ-45;  
ACU2022A: (2) 6-pin mini-DIN F, (1) HD15 M, (1) RJ-45, (2) 3.5-mm audio jacks, (1) DB9 F;  
ACU2028A: (4) 6-pin mini-DIN F, (1) HD15 M, (1) HD15 F, (1) RJ-45, (2) 3.5-mm audio jacks, (1) DB9 F;  
ACURA001A: (2) 6-pin mini-DIN F, (1) HD15 F, (1) RJ-45, (2) 3.5-mm audio jacks, (1) DB9 M;  
ACU2201A-R2: Local: (2) RJ-45, (1) DB25 F, (1) HD15 M;  
Remote: (2) RJ-45, (2) HD15 F, (2) 6-pin mini-DIN F;  
ACU2209A: Local: (2) RJ-45, (1) HD15 M, (2) HD15 F, (1) DB25 F, (2) 6-pin mini-DIN F;  
Remote: (2) RJ-45, (2) HD15 F, (2) 6-pin mini-DIN F;

ACUR002A: (2) 6-pin mini-DIN F, (2) HD15 F, (2) RJ-45;  
ACU2222A-R2: Local: (2) RJ-45, (1) HD15 M, (1) DB25 F, (2) 3.5-mm audio, (1) DB9 F;

Remote: (2) RJ-45, (2) HD15 F, (2) 6-pin mini-DIN F, (2) 3.5-mm audio, (1) DB9 F;

ACU2228A: Local: (2) RJ-45, (1) HD15 M, (2) HD15 F, (1) DB25 F, (2) 6-pin mini-DIN F, (2) 3.5-mm audio, (1) DB9 F;

Remote: (2) RJ-45, (2) HD15 F, (2) 6-pin mini-DIN F, (2) 3.5-mm audio, (1) DB9 F;

ACURA002A: (2) 6-pin mini-DIN F, (2) HD15 F, (2) RJ-45, (2) 3.5-mm audio jacks, (1) DB9 M

**Indicators** — Per each RJ-45 connector: (2) Status LEDs:

(1) green that flashes when remote unit is powered and video sync is found, is off when remote unit is not powered, and is on when remote unit is powered but no video is found;  
(1) yellow that flashes when local unit is transferring data, is off when local unit is not transferring data, and is on when remote unit is in Command Mode

**Power** — Local units: ACU2201A-R2, ACU2222A-R2: From desktop power supply, PSU1006E-R2, certified to the relevant international safety standards:

Input: 100–240 VAC, 50–60 Hz;

Output: 5 VDC;

All other local units: From the PC;

Remote units: From desktop power supply, PSU1002E-R3 (certified to the relevant international safety standards):

Input: 100–240 VAC, 50–60 Hz;

Output: 9 V DC

**Size** — Local units:

ACU2001A, ACU2009A, ACU2209A, ACU2228A: 1.4"H x 3.9"W x 7.8"D (3.6 x 9.9 x 19.8 cm);

ACU2022A, ACU2028A: 1.7"H x 3.9"W x 7.8"D (4.3 x 9.9 x 19.8 cm);

ACU2201A-R2: 1.1"H x 5.8"W x 4.3"D (2.8 x 14.7 x 10.9 cm);

ACU2222A-R2: 1.6"H x 5.7"W x 4.3"D (4.1 x 14.5 x 10.9 cm)

Remote units:

ACU2001A, ACU2009A, ACU2209A, ACU2228A: 1.1"H x 5.7"W x 5.5"D (2.8 x 14.5 x 14 cm);

ACU2022A, ACU2028A, ACU2201A-R2, ACU2222A-R2: 1.7"H x 5.7"W x 5.5"D (4.3 x 14.5 x 14 cm)



ACU2028A

Item	Code
<b>For point-to-point extension, order...</b>	
ServSwitch Brand Single-Video CATx KVM Extenders	
Single-Access Kit	<b>ACU2001A</b>
Dual-Access Kit	<b>ACU2009A</b>
<b>To add CATx KVM Extender capabilities to an existing extender application, order...</b>	
ServSwitch Brand Single-Video CATx KVM Extender	
Standalone Remote Unit	<b>ACUR001A</b>
<b>For point-to-point extension with serial and audio capabilities, order...</b>	
ServSwitch Brand Single-Video CATx KVM Extenders	
with Serial and Audio	
Single-Access Kit	<b>ACU2022A</b>
Dual-Access Kit	<b>ACU2028A</b>
<b>To add extender capabilities with serial and audio functionality to an existing extender application, order...</b>	
ServSwitch Brand Single-Video CATx KVM Extender	
Standalone Remote Unit with Serial and Audio	<b>ACURA001A</b>
<b>For point-to-point extension with dual-video capabilities, order...</b>	
ServSwitch Brand Dual-Video CATx KVM Extenders	
with Single-Access Kit	<b>ACU2201A-R2</b>
with Dual-Access Kit	<b>ACU2209A</b>
<b>To add dual-video extension capabilities to an existing extender application, order...</b>	
ServSwitch Brand Dual-Video CATx KVM Extender	
Standalone Remote Unit	<b>ACUR002A</b>
<b>For point-to-point extension with dual-video, serial, and audio capabilities, order...</b>	
ServSwitch Brand Dual-Video CATx KVM Extenders	
with Serial and Audio Single-Access Kit	<b>ACU2222A-R2</b>
with Serial and Audio Dual-Access Kit	<b>ACU2228A</b>
<b>To add CATx dual-video, serial, and audio capabilities to an existing extender application, order...</b>	
ServSwitch Brand Dual-Video CATx KVM Extender	
Standalone Remote Unit with Serial and Audio	<b>ACURA002A</b>
<b>To connect an AT style computer, order...</b>	
6-Pin Mini-DIN Female to 5-Pin DIN Male	
Keyboard Adapter, with 6" (15.2-m) Cable	<b>FA222-R2</b>
AT PS/2® Mouse GHOST Emulator	<b>AC244A</b>

Item	Code
<b>To rackmount your extenders, order...</b>	
CATx KVM Extender Rackmount Kit	<b>RMK19U-X3</b>
<b>For flash memory upgrades, order...</b>	
Flash Cable for CATx KVM Extenders	<b>ACUFLH</b>
<b>To connect remote units over CAT5 cable, order...</b>	
CAT5 Unshielded Bulk Cables, 100-MHz, Solid, 4-Pair,	
Beige, 1000-ft. (304.8-m)	
PVC Spool	<b>EYN840A-1000</b>
Box	<b>EYN840A-B</b>
Plenum Box	<b>EYN860A-B</b>
(For other lengths or colors, call Tech Support.)	
<b>To terminate your bulk CAT5 cable, order...</b>	
High-Performance Category 5 Modular Plugs,	
Solid-Conductor, Unshielded, 25-Pack	<b>FM732</b>
<b>To terminate your bulk CAT5e cable, order...</b>	
CAT5e Modular Plugs, RJ-45	
10-Pack	<b>FM850-10PAK</b>
25-Pack	<b>FM850-25PAK</b>
50-Pack	<b>FM850-50PAK</b>
100-Pack	<b>FM850-100PAK</b>
250-Pack	<b>FM850-250PAK</b>
<b>To terminate your bulk CAT6 cable, order...</b>	
CAT6 Modular Plugs, RJ-45	
10-Pack	<b>FM860-10PAK</b>
25-Pack	<b>FM860-25PAK</b>
50-Pack	<b>FM860-50PAK</b>
100-Pack	<b>FM860-100PAK</b>
250-Pack	<b>FM860-250PAK</b>
<b>If you need a spare power supply, order...</b>	
5-Volt Power Supply for ServSwitch Extender (for	
ACU2201A-R2, ACU2209A, ACU2222A-R2, and ACU2228A	
Local Units Only)	<b>PSU1006E-R2</b>
9-Volt Power Supply for ServSwitch Extender	
(for Any Remote Unit)	<b>PSU1002E-R3</b>

### WHAT'S INCLUDED

<b>ACU2001A, ACU2009A,</b>	<b>ACU2022A, ACU2028A,</b>
<b>ACU2201A-R2, ACU2209A:</b>	<b>ACU2222A-R2, ACU2228A:</b>
◆ Local unit	◆ Local unit
◆ Remote unit	◆ Remote unit
◆ Cable from CPU to local unit	◆ Cable from CPU to local unit
◆ Video input cable	◆ Serial cable
◆ Power supply	◆ Audio cable
◆ Power cord	◆ Video input cable
	◆ Power supply
	◆ Power cord