BLACK BOX®
NETWORK SERVICES

KVM Switch

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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 J 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 classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

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 parato 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 deber 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 connectado 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 fisica 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 equio 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 lineas de energia.

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 objectos liquidos 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: Objectos 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. Specifications

**System
Hardware
Required —**   SW730A, SW731A:
      IBM AT or PS/2 or compatible computers, IBM AT
      keyboard (PS/2 keyboard works with additional
      adapter), RS-232 serial mouse, and VGA monitor;
    SW732A, SW733A:
      Apple Macintosh computers, keyboard, mouse, and
      monitor;
    SW734A, SW735A:
      Sun workstations, keyboard, mouse, and monitor

Compliance —   FCC Class A, DOC Class/MDC classe A

Standards —   SW730A, SW731A: VGA video (EGA/CGA video with
      additional adapters);
    SW732A, SW733A: Macintosh video;
    SW734A, SW735A: Sun video

Interfaces —   Proprietary composites:
      SW730A, SW731A:
        IBM AT keyboard, RS-232 (for serial mouse), and
        VGA video;
      SW732A, SW733A:
        Macintosh video and Apple Desktop Bus™ (for
        keyboard and mouse);
      SW734A, SW735A:
        Sun keyboard/mouse and video

**Maximum
Resolution —**   SW730A, SW731A, SW734A, SW735A:
      1280 x 1024 noninterlaced;
    SW732A, SW733A (with standard cables):
      1024 x 768 noninterlaced

**Maximum
Distance —**   21 ft. (6.4 m) of total cable from any CPU to keyboard,
      monitor, and mouse

User Controls — Front-mounted pushbuttons for switching between CPUs:
(2) on SW730A, SW732A, and SW734A;
(4) on SW731A, SW733A, and SW735A

Indicators — Front-mounted LEDs:
(1) POWER, (1 for each port) CPU POWER

Connectors — Rear-mounted DB25 female:
(1) [labeled COMMON] to monitor/keyboard/mouse;
(1 for each port) [numbered] to CPUs

**Maximum
Altitude —** 10,000 ft. (3048 m)

Temperature — 32 to 131˚ F (0 to 55˚ C)

Humidity — 0 to 85% noncondensing

Enclosure — Steel

Power — From CPU ports; approximately 50 mA at 5 volts

Size — 2.25"H x 8.8"W x 4.9"D (5.7 x 22.4 x 12.4 cm)

Weight — Net: 3 lb. (1.4 kg);
Shipping: 4 lb. (1.8 kg)

2. Introduction

Thank you for choosing a KVM Switch. Designed with your needs in mind, and for plug-and-play operation in particular, your new switch will simplify your job by helping you organize your multiple-computer applications. Because the KVM Switch lets you use a single keyboard, monitor, and mouse to access a number of computers, you can significantly reduce your equipment overhead and end keyboard and monitor clutter.

This chapter describes everything that comes with the switch, the external and operating features of the switch, and the cabling you'll need for the switch.

2.1 The Complete Package

Your KVM Switch package includes the KVM Switch unit and this manual. If you didn't receive everything, contact Black Box.

2.2 Operating Features

Some of the useful features of your KVM Switch:

- Access two or four CPUs with one keyboard, monitor, and mouse.

- Available in six different models for three different platforms:
    For IBM® AT® or PS/2® PCs or compatibles: SW730A has two ports, SW731A has four.
    For Apple® Macintosh® computers: SW732A has two ports, SW733A has four.
    For Sun® workstations: SW734A has two ports, SW735A has four.

- PC and Sun models only: Emulates keyboard and mouse functions for automatic boot-up.

- With front-panel pushbuttons, you can switch directly to your desired CPU without cycling through other CPUs (as you would with a rotary-knob type of switch).

- Has its own printed-circuit board for maximum reliability.

- Supports all video resolutions up to 1280x1024 noninterlaced (Sun models) or 1024 x 768 noninterlaced (PC and Mac® models).

- *PC models only:* Supports the functions and modes of AT compatible keyboards.

- *Mac and Sun models only:* Can be set to either pass through or override monitor ID bits to each CPU.

- Front-panel LEDs show Switch power, selected CPU and its power-on state, and other conditions.

- No external power supply; low-power circuitry uses power from CPUs.

- Power to keyboard and mouse is maintained during switching for smooth trouble-free operation.

- Adapter cables that merge keyboard, video, and mouse signals onto single DB25 connectors simplify cable management.

- 19" rackmount kits available.

2.3 The Front Panel

The KVM Switch's front panel features two or four push-button switches and several LED indicators. To familiarize yourself with these controls and indicators, refer to the illustration and descriptions that follow.
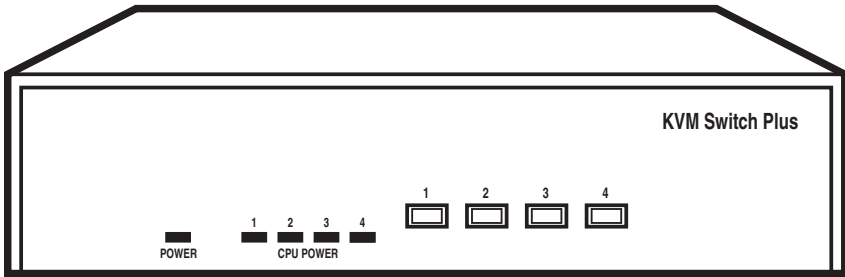
Fig. 2-1. The front panel of a KVM Switch (4-port model).

POWER Power LED: Lights steadily to indicate that the unit is powered ON. Flashes to indicate self-test, error, or CPU attempt to initialize the keyboard (see **Section 3.2.5**)

CPU POWER CPU Power LEDs: Numbered LEDs indicate whether the CPUs connected to the corresponding ports on the rear panel are powered on.

1, 2, 3, 4 Port-Selection Buttons: Press these buttons to manually switch the shared monitor, keyboard, and mouse from the currently selected computer to the next one in sequence.

2.4 The Rear Panel

All cable connections are made at the KVM Switch's rear panel, as illustrated and described below.
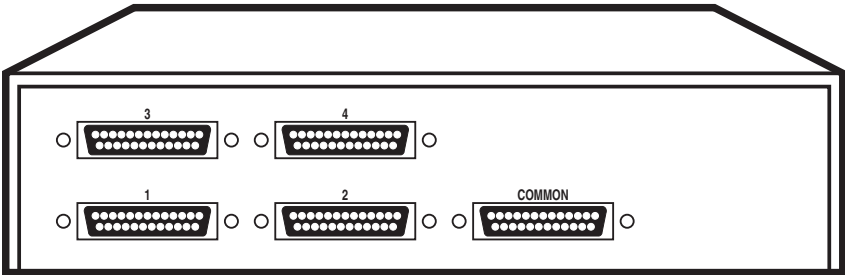
Fig. 2-2. The rear panel of a KVM Switch (4 port model).

Panel Label	Connector	Description
1, 2, 3, 4	DB25F	Connect the sharing computers to these ports with special CPU Adapter Cables. At the switch end these cables have a DB25M connector; at the other end[s], they have appropriate connectors to plug into your CPUs' video, keyboard, and (PC models only) mouse ports. These cables carry between the CPU ports and the KVM Switch all necessary signals that would normally pass between the CPU ports and the monitor, keyboard, and mouse. You must have an adapter cable for each CPU you plan to connect. See the next section.
COMMON	DB25F	Connect the shared monitor, keyboard, and mouse to this port using an MKM Adapter Cable. At the switch end, this cable has a DB25M connector; at the other end[s], it has appropriate connectors to plug into your monitor, keyboard, and (PC models only) mouse cables. Only one MKM Adapter Cable is needed. See the next section.

2.5 Cable Requirements

Many switches of this type have what seems like ten million connectors on their rear panels: one for each CPU's video cable, one for each keyboard cable, and (on PC-type switches) a third for each mouse cable. The potential for tangling or mismatching cables is high. By contrast, you can connect the KVM Switch to each of your CPUs with a single, special CPU Adapter Cable which ties both or all three of those cables into one. Likewise, connect the KVM Switch to the shared monitor, keyboard and mouse with a single MKM Adapter Cable.

The exact type(s) of cables you'll need will depend on the equipment you are connecting for your application. Refer to **Appendix B** for the available types of these cables and the corresponding product codes.

PC models (SW730A, SW731A) only: To attach any EGA computers to the Switch, you would need to use EGA-to-VGA adapters with VGA-type CPU Adapter Cables. Call Black Box for a quote on EGA-to-VGA adapters.

3. Installation

3.1 Quick Setup Guide

Figure 3-1, below, offers a basic example of how to connect your CPUs, keyboard, monitor, and mouse to the KVM Switch unit. Connectors will vary depending on the types of equipment you are installing.

NOTE

You can connect EGA CPUs to PC models of the KVM Switch if you have (a) a multisync monitor with a horizontal scan-frequency range of 15.5 to 35 KHz, and (b) an EGA-to-VGA adapter for each EGA computer. These adapters plug into each EGA CPU's video port, altering the EGA video signal so that it can be carried over VGA cable. (The PC models of the KVM Switch natively support VGA only.) Call Black Box for a quote on EGA-to-VGA adapters.
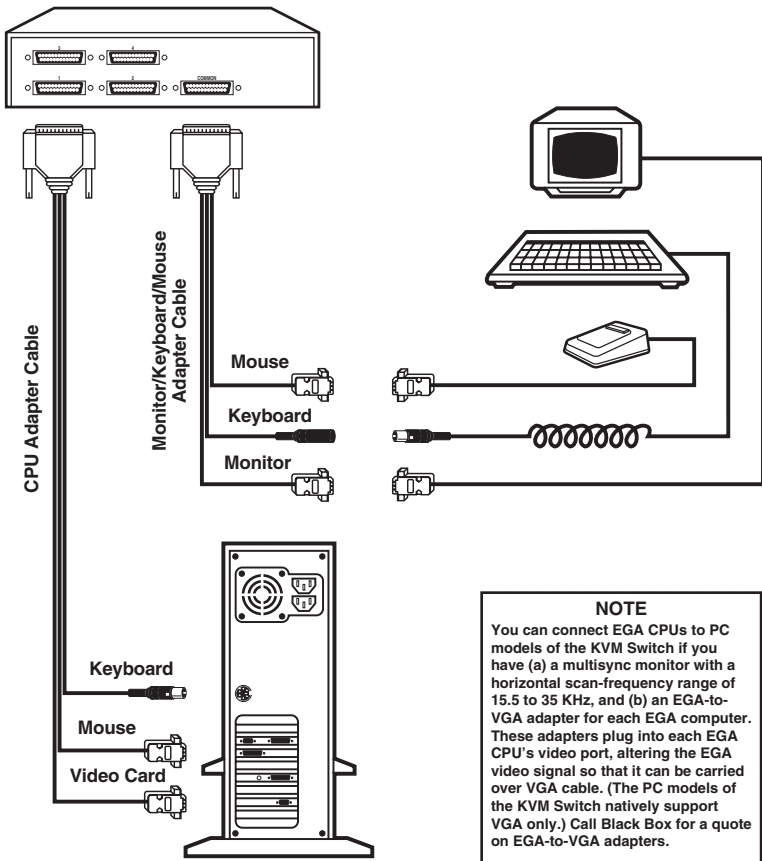
Fig. 3-1. System setup for a 4-port PC model (SW731A).

3.2 Installation Procedure

This section provides complete, detailed instructions for setting up a KVM Switch. For an illustrated example, see Figure 3-1 on the previous page.

NOTE

Be sure that all computers you are connecting to your KVM Switch will support the monitor, keyboard, and mouse you plan to use.

3.2.1 MAC AND SUN MODELS ONLY: SETTING THE ID-BIT JUMPERS

The KVM Switch normally passes all ID bits through from the monitor to the connected Macintosh or Sun CPUs. However, if you would like your CPUs to share a monitor (such as a PC VGA monitor) that doesn't support ID bits, you must "fool" them by "hardwiring" the KVM Switch to provide the ID bits. This requires you to set four ID-bit jumpers inside the Switch.

To do this, first make sure that any equipment you might have already connected to the KVM Switch is turned off, and that all cables you might have already connected to the Switch are disconnected. Now unscrew the two Phillips screws on each side of the Switch's housing and remove the housing. Look at the Switch's circuit board: The ID-bit jumpers are right next to the COMMON connector. They are labeled JP20 (controls ID0), JP21 (controls ID1), JP22 (controls ID2), and JP23 (controls ID3).

With the front panel facing you, the jumpers are factory-installed in the *right-hand* position; while they remain in this position, the ID bits will be passed through to the CPUs. To force an ID bit low (to take value 0), move the corresponding jumper to the *left-hand* position (this connects that lead to ground). To force an ID bit high (to take value 1), move the corresponding jumper to the *open* position (one leg of the jumper on a post, the other not connected to anything).

When you finish setting the jumpers, put the Switch's housing back on and screw its screws back in.

3.2.2 RACKMOUNTING (OPTIONAL)

If you would like to mount the KVM Switch in a 19" equipment rack, use the 19" Rackmount Kit (our product code SW727A) and do so now. The Switch is pre-drilled to accept the rackmounting screws.

3.2.3 CONNECTING THE MONITOR, KEYBOARD, AND MOUSE

A Monitor/Keyboard/Mouse (MKM) Adapter Cable connects your monitor, keyboard, and mouse to the KVM Switch. Because various styles of electrical connectors are used by different classes of equipment, Black Box carries this adapter cable in various styles to match.

1. Plug the DB25 male connector of the MKM Adapter Cable into the port labeled "COMMON" on the KVM Switch's rear panel.

2. Plug the cables from your shared monitor and keyboard into the corresponding connectors at the other end[s] of the MKM Adapter Cable.

    PC models (SW730A, SW731A) only:

    a. To use a PS/2 keyboard, you will need to attach a special keyboard adapter (6-pin mini-DIN female to 5-pin DIN male, our product code FA212) between the keyboard cable's connector and the MKM Adapter Cable's connector.

    b. The Switch is transparent to the shared keyboard's scan mode, but all of the connected CPUs must be able to support the scan mode of the shared keyboard.

    c. Plug the cable from your shared mouse into the corresponding connector of the MKM Adapter Cable. The mouse *must* be an RS-232 serial mouse; the KVM Switch does not support standard PS/2 bus mice.

3.2.4 CONNECTING THE CPUS

CAUTION!

Avoid routing cable near fluorescent lights, air conditioning compressors, or machines that may create electrical noise. Total cable length from the keyboard, monitor, and mouse to any given CPU should not exceed 21 feet (6.4 m).

CPU Adapter Cables connect your computers to the KVM Switch. Each computer requires its own adapter cable, made to fit the CPU's connectors. Black Box carries these.

1. Plug the DB25 male connector of the CPU Adapter Cable into one of the numbered (CPU) ports on the KVM Switch's rear panel.

2. Plug the CPU Adapter Cable's video- and keyboard-port connectors into the corresponding ports on the CPU.
   PC models (SW730A, SW731A) only:
      a. To attach the keyboard-port connector of the CPU Adapter Cable to the keyboard port of a PS/2, you will need to place a special keyboard adapter (5-pin DIN female to 6-pin mini-DIN male, our product code FA211) between them.

      b. Plug the mouse-port connector into the serial port designated as the mouse port. (This connector can *not* be attached to the PS/2 bus-mouse port, even with an adapter—the KVM Switch doesn't support PS/2 bus mice. You must use an RS-232 mouse.) Make sure your mouse driver is properly configured to interact with the chosen serial port.

3.2.5 POWERING UP THE SYSTEM AND INTERPRETING THE LEDS

If they aren't already ON, power up the connected CPUs one by one, giving each one time to boot completely before turning ON the next one. PC and Sun models of the Switch emulate keyboard and mouse functions for automatic boot-up. The Switch's LEDs will indicate various conditions:

- After the first of the connected CPUs powers up, the POWER LED will flash *rapidly* five times while the Switch's microprocessor performs a self-test. If no problems are detected, the POWER LED will stop flashing and remain steadily lit to indicate that the Switch is receiving power and operating correctly. If the Switch detects any of several microprocessor errors, the POWER LED will continue to flash indefinitely to indicate that the Switch is malfunctioning; call Black Box for technical support (see **Section 5.2**).

- If a CPU is designed to initialize its keyboard when the CPU boots or is reset, the POWER LED will flash *slowly* five times whenever that CPU attempts to initialize the keyboard. This alerts you to both normal reset conditions (such as initial boot-up) and abnormal reset conditions (such as power interruptions). It also alerts you to attend to any CPUs that require intervention (such as manual resetting of parameters) when the CPU boots.

- While any connected CPU is powered ON, the corresponding CPU POWER LED (CPU POWER 1 for the CPU connected to port 1, for example) will be steadily lit to indicate that that CPU is ON and connected.

The installation is now complete; your KVM Switch should be ready for continuous operation.

4. Operation

4.1 The Switching Procedure

It is very easy to switch between connected CPUs in a KVM Switch system: Press the button on the front panel of the Switch that corresponds to the Switch port that the desired CPU is connected to. (For information about the Switch's LEDs, see **Section 3.2.5** on the previous page.**)**

4.2 Guidelines for Using the KVM Switch with Your Equipment

4.2.1 CPUs

PC models (SW730A, SW731A) only: Use only IBM AT or PS/2 or 100% compatible machines. The KVM Switch does not support IBM PC/XT™ or compatible machines.

4.2.2 MOUSE AND KEYBOARD

When you power up your CPUs, make sure your mouse, keyboard, and CPUs are all properly cabled to the KVM Switch.

   PC models (SW730A, SW731A) only: The KVM Switch works well with 2-button RS-232 mice by Microsoft® or Logitech™. It also works with many 3-button mice. However, the Switch does not support PS/2 bus mice, and it does not support mice that must receive configuration data from the CPU. Also, the KVM Switch is transparent to the keyboard-scan mode, but each CPU must support the scan mode used by the shared keyboard.

4.2.3 MONITOR

The adapter cables used by the PC and Sun models of the KVM Switch are coaxial. This heavy-duty construction allows them to carry near-perfect video at resolutions up to 1280 x 1024 as far as 21 ft. (6.4 m). However, the standard cables used with the Mac models of the Switch (SW732A, SW733A) are less robust; the video quality you see on the monitor will decrease at higher resolutions and distances, as shown in Table 4-1 on the next page. The distances in the table are total cable lengths measured from the CPU to the monitor; they represent the three different total distances you can get with stock-length cables.

   Coaxial cabling is available for your Mac KVM Switch system. These cables carry video as well as the standard PC and Sun cables do, but they are a special order. Call Black Box for a quote.

PC models (SW730A, SW731A) only: The KVM Switch is designed to support standard VGA video. It does not support PCs that use proprietary versions of VGA that depart from the original specifications. Consult with your PC's manual, and if that doesn't tell you, consult with the PC's or the video card's manufacturer.

NOTE

To connect EGA PCs to the KVM Switch, you will need EGA-to-VGA adapters for all your CPUs. You will also need a multisync monitor capable of synchronizing to a horizontal scan rate of 15.5 to 35 KHz. These can be hard to find. One set of models that fit the bill is older NEC Multisync II monitors.

Table 4-1. Video Quality vs. Distance, Mac Models

Resolution	Distance	6' (1.8 m)	11' (3.3 m)	21' (6.4 m)
640 x 480		3	3	3
800 x 600 non-interlaced		3	3	2
1024 x 768 (interlaced or not)		3	3	2
1280 x 1024 (interlaced or not)		2	2	1

Quality **3** = Perfect or near-perfect; screen defects are difficult to detect.

Quality **2** = Very good; images are clear; there are small reflections around text lettering depending on the color; screen defects are visible if you look closely

Quality **1** = Fair to poor as distance increases; images run from slightly fuzzy to badly smeared; text runs from fuzzy but readable to completely washed out

5. Troubleshooting

The first section of this chapter discusses some of the problems that can arise in a KVM Switch system and suggests possible causes and solutions. **Sections 5.2** and **5.3** discuss what's involved in calling Black Box and shipping your KVM Switch.

5.1 Common Problems

5.1.1 A CPU CONNECTED TO YOUR KVM SWITCH DOESN'T BOOT, AND YOU GET A KEYBOARD OR MOUSE ERROR

A. Check your cables. Tighten any loose connections. Either reboot the affected computer or (PC models only) press the [F1] key on the PC keyboard to continue.

B. If you don't find a cable error, begin swapping your cables one at a time. If the problem goes away when you substitute a cable, the old cable is probably defective.

C. If swapping cables doesn't solve the problem, try plugging the CPU into a different CPU port on the KVM Switch. If the CPU boots when it's connected to a different port, the old port is probably defective.

D. If swapping ports doesn't solve the problem, try plugging the keyboard and mouse directly into the CPU that's having the problem. If the CPU boots, the KVM Switch might be defective; call Black Box for technical support.

E. If the CPU still doesn't boot, the CPU's keyboard or mouse port (or other components) might be defective. (If the CPU's Power LED doesn't light, the fuse on the CPU's motherboard might be blown.) If you still have them, plug that CPU's original monitor, keyboard and mouse into it and try again. If the CPU does *not* boot with its original equipment, something in the CPU is defective; call the CPU's manufacturer. If the CPU *does* boot, there is some kind of unusual mismatch between that CPU and the shared monitor, keyboard, or mouse; call Black Box for technical support.

5.1.2 YOUR MOUSE DRIVER DOESN'T LOAD (PC MODELS ONLY)

A. What type of mouse are you using? The KVM Switch does not support PS/2 bus mice, only RS-232 serial mice.

B. Make sure that you're using the right COM port, and that the mouse driver is looking for the correct port.

C. Many mouse drivers require that the mouse be connected before they are loaded. Either switch to the mouse's COM port or get a driver that doesn't require the mouse to be present to load.

D. Your mouse driver might be old or incompatible with your mouse. Try the latest version.

5.1.3 YOUR MONITOR DISPLAY IS FUZZY

A. Check the settings of your monitor, especially the sharpness control.

B. If you can't solve the problem by changing the monitor settings, you might have run cable too far; maximum cable distance from any CPU to the shared monitor, keyboard, and mouse is 21 ft. (6.4 m). See **Section 4.2.3**.

5.1.4 YOUR VIDEO IS NOT SYNCHRONIZED OR IS THE WRONG COLOR

A. Check the settings of your monitor, especially the sync or color controls.

B. If you can't solve the problem by changing the monitor settings, check the video strands of your cables. Tighten any loose connections.

C. *Mac and Sun models only:* The ID-bit jumpers in the Switch aren't set correctly. See **Section 3.2.1**.

D. If no cable connectors are loose, begin swapping your cables one at a time. If the problem goes away when you substitute a cable, the old cable is probably defective.

E. If swapping cables doesn't solve the problem, try plugging the CPU into a different CPU port on the KVM Switch. If the video is good when the CPU is connected to a different port, the old port is probably defective.

5.1.5 THE POWER LED FLASHES CONTINUOUSLY

The Switch has detected a problem with its microprocessor.
Call Black Box for technical support.

5.2 Calling Black Box

If you determine that your KVM Switch is malfunctioning, *do not attempt to alter or repair the unit.* It contains no user-serviceable parts. Contact Black Box.

Before you do, make a record of the history of the problem. Black Box 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.

5.3 Shipping and Packaging

If you need to transport or ship your KVM Switch:

- Package it carefully. We recommend that you use the original container.

- If you are shipping the KVM Switch for repair, make sure you include the adapter cables you're using with it. If you are returning the KVM Switch, make sure you include its manual as well. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.

Appendix A: Connector Pinout

The table below shows the pinout of the DB25 female connectors on the KVM Switch.
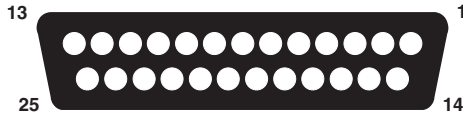
Pin	Numbered CPU Ports	Monitor/Keyboard/ Mouse Port	Description
1	Ground	Ground	Analog Ground
2	Ground	Ground	Analog Ground
3	Ground	Ground	Analog Ground
4	Ground	Ground	Digital Ground
5	HSync-in	HSync-out	Video Control
6	VSync-in	VSync-out	Video Control
7	KBClk	KBClk	Keyboard Clock
8	KBData	KBData	Keyboard Data
9	Reserved	Reserved	Do not use
10	Reserved	Reserved	Do not use
11	+5V-in	+5V-out	Power for LEDs, Peripherals
12	RS-232-out	RS-232-in	Serial Data
13	RS-232-in	RS-232-out	Serial Data
14	Red-in	Red-out	VGA Color
15	Green-in	Green-out	VGA Color
16	Blue-in	Blue-out	VGA Color
17	ID0 out	ID0 in	ID0
18	ID1 out	ID1 in	ID1
19	ID2 out	ID2 in	ID2
20	CSync in	CSync out	Composite Sync
21	Unused	V–	Mouse Power
22	Ground	Ground	Digital Ground
23	Ground	Ground	Digital Ground
24	Unused	V+	Mouse Power
25	ID3 out	ID3 in	ID3

Appendix B: Cable Product Codes

The table below lists the product codes for all the types of cables we offer for use with the KVM Switch. The four digits that follow the dash in each product code indicate how long each cable is in feet (one foot = 0.3 m). If your KVM-sharing system has cabling requirements that can't be met by what you see here, call Black Box for a possible quote on custom cables or adapters.

Monitor/Keyboard/Mouse Adapter Cables:

Monitor Type (Connector on Cable)	Keyboard Type (Connector on Cable)	Mouse Type (Connector on Cable)	Product Code
VGA (DB15HD female)	IBM AT (5-pin DIN female)	Serial RS-232 (DB9 male)	EHN052-0001
Mac (DB15 female)	Mac (4-pin mini-DIN female)	Mac (none)*	EHN104-0001
Sun (13W3 female)	Sun (8-pin mini-DIN female)	Sun (none)*	EHN102-0001

CPU Adapter Cables:

Video Type (Connector on Cable)	Keyboard Type (Connector on Cable)	Mouse Type (Connector on Cable)	Product Code
VGA (DB15HD male)	IBM AT (5-pin DIN male)	Serial RS-232 (DB9 female)	EHN048-00xx**
Mac (DB15 male)	Mac (4-pin mini-DIN male)	Mac (none)*	EHN105-00xx**
Sun (13W3 male)	Sun (8-pin mini-DIN male)	Sun (none)*	EHN103-00xx**

*In Mac and Sun architectures, the mouse is plugged into the keyboard, not directly into the CPU.

** "xx" stands for length in feet, where xx = 05, 10, or 20. One foot = 0.3 m.