ServSwitch Wizard VGA (USB)

Control up to four VGA video-equipped computer systems and share peripherals among them.

KV3004A supports one video head per channel, KV3204A supports two, KV3304A supports three, and KV3404A supports four.

Trademarks Used in this Manual

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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.

Instrucciones de Seguridad

(Normas Oficiales Mexicanas 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 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 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 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 objetos 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

Approvals:	CE, FCC	
Hardware Compatibility:	All computers with VGA analog video and USB interfaces	
Software Compatibility:	Operates with all known software and operating systems including Windows®, Linux®, Unix®, BSD, all Sun® OS, all Mac® OS, NetWare®, etc.	
Connectors:	Video:	15-way female D-sub
	Keyboard/Mouse:	USB Type A female
	Switched USB:	USB 2.0 Type A female
	Audio:	3.5-mm stereo jack
	Other:	Modular 10p10c for Flash upgrade, sync with other KV3x04A switches and RS-232 triggered power switches
Operating Temperature:	32 to 104°F (0 to 40°C)	
Power:	2.5mm DC jack (power adapter included)	
	Input:	100–240 VAC, 50/60 Hz
	Output:	5VDC, 2.5A or 4A
	Consumption:	KV3004A: 12.5 watts
		KV3204A, KV3304A, KV3404A: 20 watts
Size:	KV3004A: 1.73"H (1U) x 9.21"W x 4.72"D (4.39 x 23.39 x 11.99 cm) KV3204A, KV3304A, KV3404A: 4.375"H (2.5U) x 9.21"W x 4.72"D (11.13 x 23.39 x 11.99 cm)	
Weight:	KV3004A: 1.87 lb. (0.85 kg); KV3204A: 2 lb. (0.91 kg) KV3304A: 2.1 lb. (0.95 kg); KV3404A: 2.2 lb. (1 kg)	

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2. Overview

2.1 Introduction

There are four versions of the four-way ServSwitch Wizard™ VGA (USB), each of which allows a single operator to control up to four computer systems and share peripherals among them in a very flexible manner. The KV3004A can support one video head per channel, whereas the slightly larger KV3204A, KV3304A and KV3404A units support two, three and four video heads per channel, respectively.

In addition to impressive VGA video performance, these units offer more than just straight switching between four systems. The KVM, speakers and two separate USB devices attached to the ServSwitch Wizard VGA (USB) units can either be switched in unison, as normal, or you can mix your peripherals between any of the systems to suit your current tasks. For instance, you could be creating emails on one system, listening to a soundtrack from another while a third is sending documents to your printer and a fourth performing another task with a different USB peripheral. The ServSwitch Wizard VGA (USB) front panels make it straightforward to control which peripherals should connect to each system.

The ServSwitch Wizard VGA (USB) units feature True Emulation (see Appendix A for more details) which ensures that the full characteristics of the connected keyboard and mouse are passed to every system.
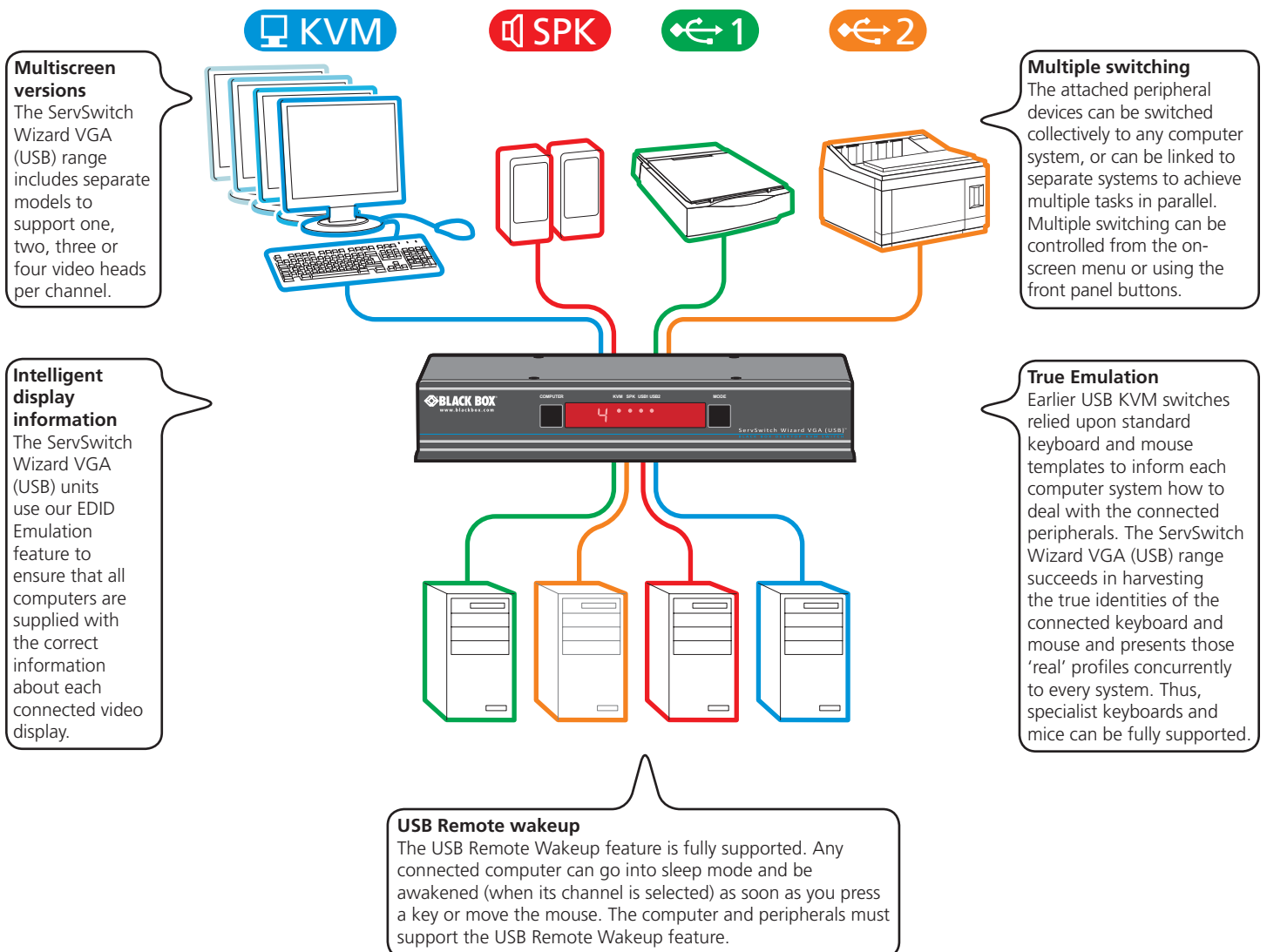
Multiscreen versions
The ServSwitch Wizard VGA (USB) range includes separate models to support one, two, three or four video heads per channel.

Multiple switching
The attached peripheral devices can be switched collectively to any computer system, or can be linked to separate systems to achieve multiple tasks in parallel. Multiple switching can be controlled from the on-screen menu or using the front panel buttons.

Intelligent display information
The ServSwitch Wizard VGA (USB) units use our EDID Emulation feature to ensure that all computers are supplied with the correct information about each connected video display.

True Emulation
Earlier USB KVM switches relied upon standard keyboard and mouse templates to inform each computer system how to deal with the connected peripherals. The ServSwitch Wizard VGA (USB) range succeeds in harvesting the true identities of the connected keyboard and mouse and presents those 'real' profiles concurrently to every system. Thus, specialist keyboards and mice can be fully supported.

USB Remote wakeup
The USB Remote Wakeup feature is fully supported. Any connected computer can go into sleep mode and be awakened (when its channel is selected) as soon as you press a key or move the mouse. The computer and peripherals must support the USB Remote Wakeup feature.

Figure 2-1. Overview of the ServSwitch Wizard VGA (USB).

2.2 Features

Multiscreen Versions

The ServSwitch Wizard VGA (USB) includes separate models to support one, two, three, or four video heads per channel.

Multiple Switching

The attached peripheral devices can be switched collectively to any computer system, or they can be linked to separate systems to achieve multiple tasks in parallel. Multiple switching can be controlled from the on-screen menu or using the front-panel buttons.

Analog Video

The ServSwitch Wizard VGA (USB) uses VGA connectors throughout for full compatibility with legacy analog systems.

True Emulation

Earlier USB KVM switches relied upon standard keyboard and mouse templates to tell each computer system how to deal with the connected peripherals. The ServSwitch Wizard VGA (USB) range gathers the true identities of the connected keyboard and mouse and presents those "real" profiles concurrently to every system. Thus, specialized keyboards and mice can be fully supported.

Intelligent Display Information

The ServSwitch Wizard VGA (USB) uses an EDID emulation feature to ensure that all computers are supplied with the correct information about each connected video display.

USB Remote Wakeup

The ServSwitch Wizard VGA (USB) fully supports the USB Remote Wakeup feature. Any connected computer can go into sleep mode and be awakened (when its channel is selected) as soon as you press a key or move the mouse. Note that the computer and peripherals must also support the USB Remote Wakeup feature.

2.3 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box at 724-746-5500 or info@blackbox.com.

- ServSwitch Wizard VGA (USB) unit

- Power adapter and power cord

- (4) Self-adhesive feet

- CD-ROM containing this user manual in PDF format

2.4 Additional Items You May Need

- VGA video cable (P/N: EVNPS06)

- USB cable (type-A to type-B) not exceeding 15 feet/5m (P/N: USB05)

- Composite 2-in-1 VGA and USB cable (P/N: EHN810)

- 3.5mm Audio cable (P/N: EJ110)

- Flash upgrade adapter (P/N: FA4509F)*

- (2) 19" rackmount brackets and (4) screws (P/N: RMK2004)*

  * The FA4509F Flash upgrade adapter comes unassembled; refer to Appendix C for pinning. You will also need a standard RJ-45 Ethernet Patch Cord to connect the adapter to the KVM switch. Verify the computer's serial connector first prior to ordering as some computers may not have a DB9 connector.

  * The rackmount bracket is compatible with the KV3004A model only

2.5 Hardware Description, Single Head Version (KV3004A)

2.5.1 Front Panel

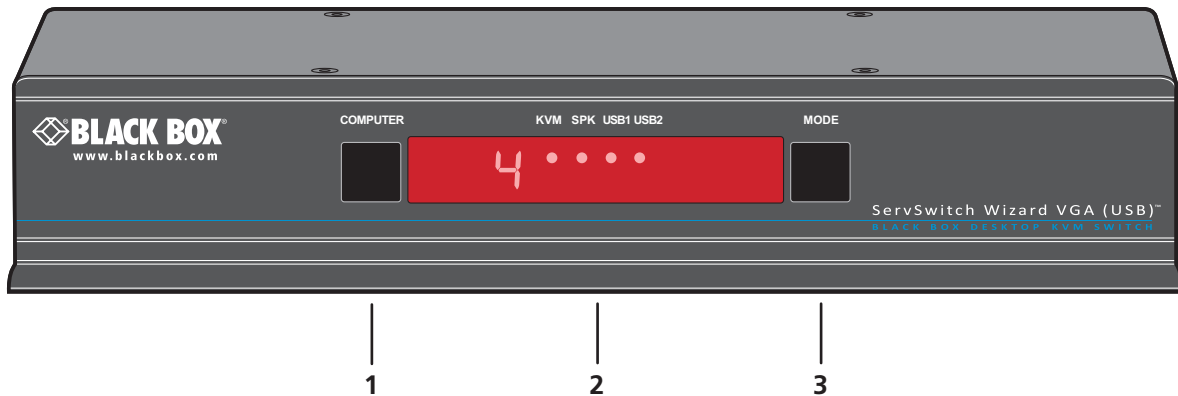Figure 2-1 shows the front panel of the unit. Table 2-2 describes its components:

Figure 2-2. Front panel.

Table 2-1. Front panel components.

Number	Component	Description
1	COMPUTER button	Press to change to the next computer channel.
2	Indicators	The four indicators (KVM, SPK, USB1, USB2) show which peripherals are switched to the current computer channel or (as you begin pressing the MODE button) the peripherals that will be switched during the next press(es) of the COMPUTER button.
		The seven-segment numeric display indicates the computer channel that is currently active.
3	MODE button	Press to determine which peripherals should be switched to another computer channel (will occur when you press the COMPUTER button).

2.5.2 Rear Panel

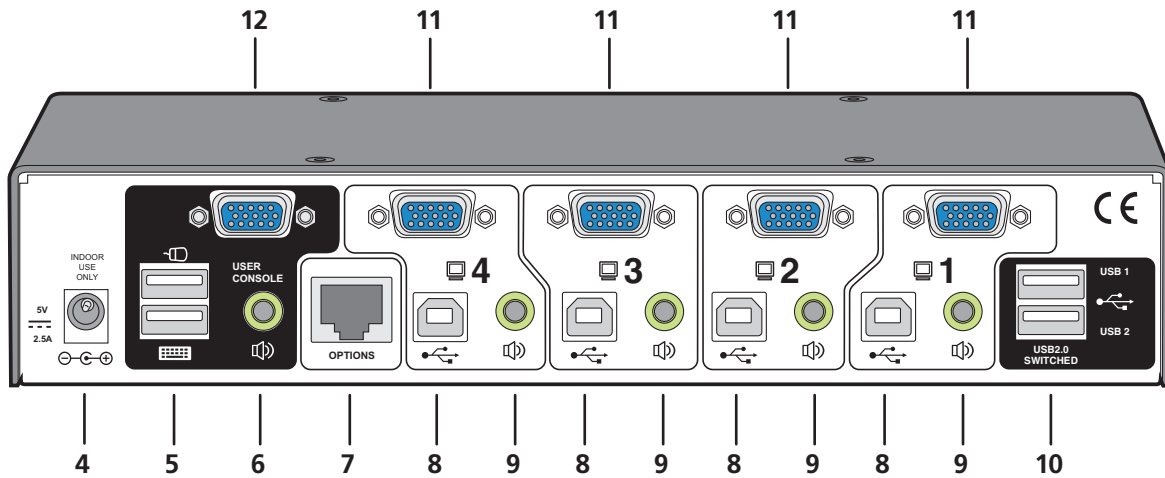Figure 2-3 shows the rear panel of the unit. Table 2-2 describes its components:

Figure 2-3. Rear panel.

Table 2-2. Rear panel components.

Number	Component	Description
4	2.5-mm Barrel connector	Power input or power supply connects here.
5	(2) USB Type A connectors	Connect the console's USB keyboard and mouse to these connectors.
6	3.5-mm RCA connector	User console audio port: Connect optional speakers to this connector.
7	RJ-45 port	*Options port: This top 10p10c port is used to allow external control of channel switching and also to update the internal firmware when necessary by connecting to a computer.
8	(4) USB Type B connectors	Connect to a USB port on each computer.
9	(4) 3.5-mm RCA connectors	Connect to the speaker output socket on each computer (optional connection).
10	(2) USB Type A connectors	Connect to the console's USB 2.0 peripheral devices (optional connection).
11	(4) VGA connectors	Connect to the video output port of each computer.
12	VGA connector	Connect to the console's video monitor

*NOTE: The OPTIONS port uses a 10p10c socket, which can accommodate both 10p10c connectors as well as the much more common 8p8c connectors, which are used on Ethernet leads and patch cables. The pin-outs for both types of connectors are listed in Appendix C.

2.6 Hardware Description, Multi Head Versions (KV3204A, KV3304A, KV3404A)

2.6.1 Front Panel

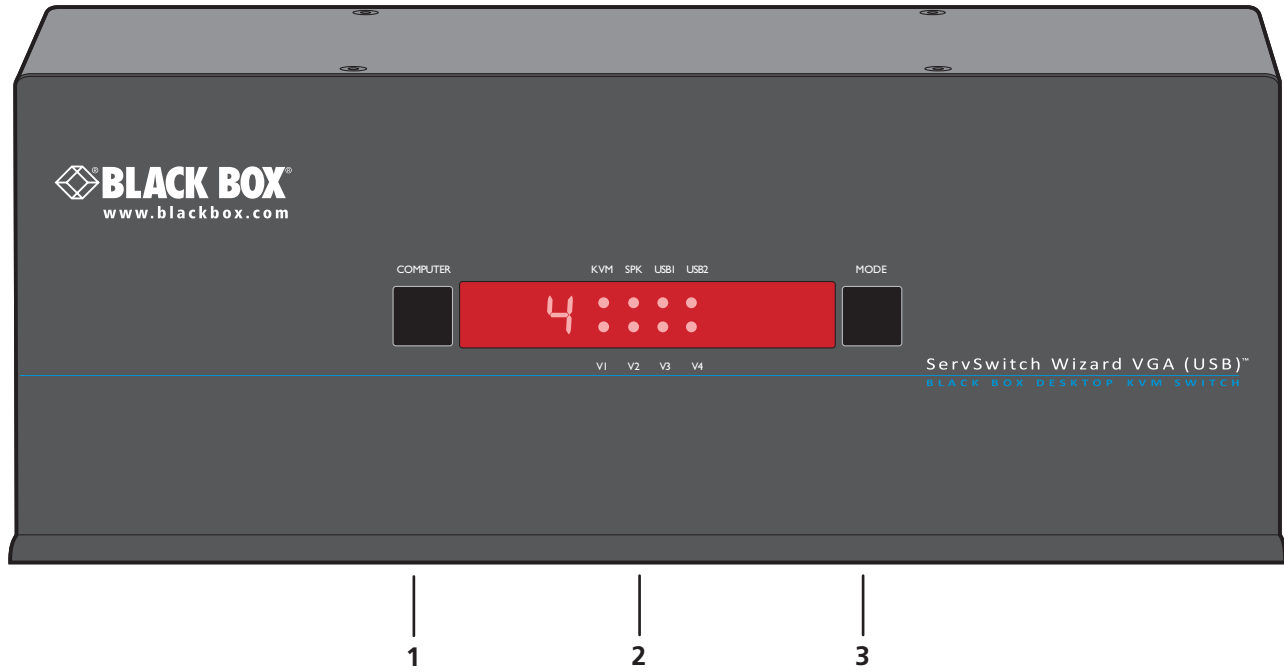Figure 2-4 shows the front panel of the unit. Table 2-3 describes its components:

Figure 2-4. Front panel.

Table 2-3. Front panel components.

Number	Component	Description
1	COMPUTER button	Press to change to the next computer channel.
2	Indicators	The four upper indicators (KVM, SPK, USB1, USB2) show which peripherals are switched to the current computer channel or (as you begin pressing the MODE button) the peripherals that will be switched during the next press(es) of the COMPUTER button.
		The four lower indicators, labeled V1 to V4, show the video channels being switched.
		The seven-segment numeric display indicates the computer channel that is currently active.
3	MODE button	Press to determine which peripherals should be switched to another computer channel (will occur when you press the COMPUTER button).

2.6.2 Rear Panel

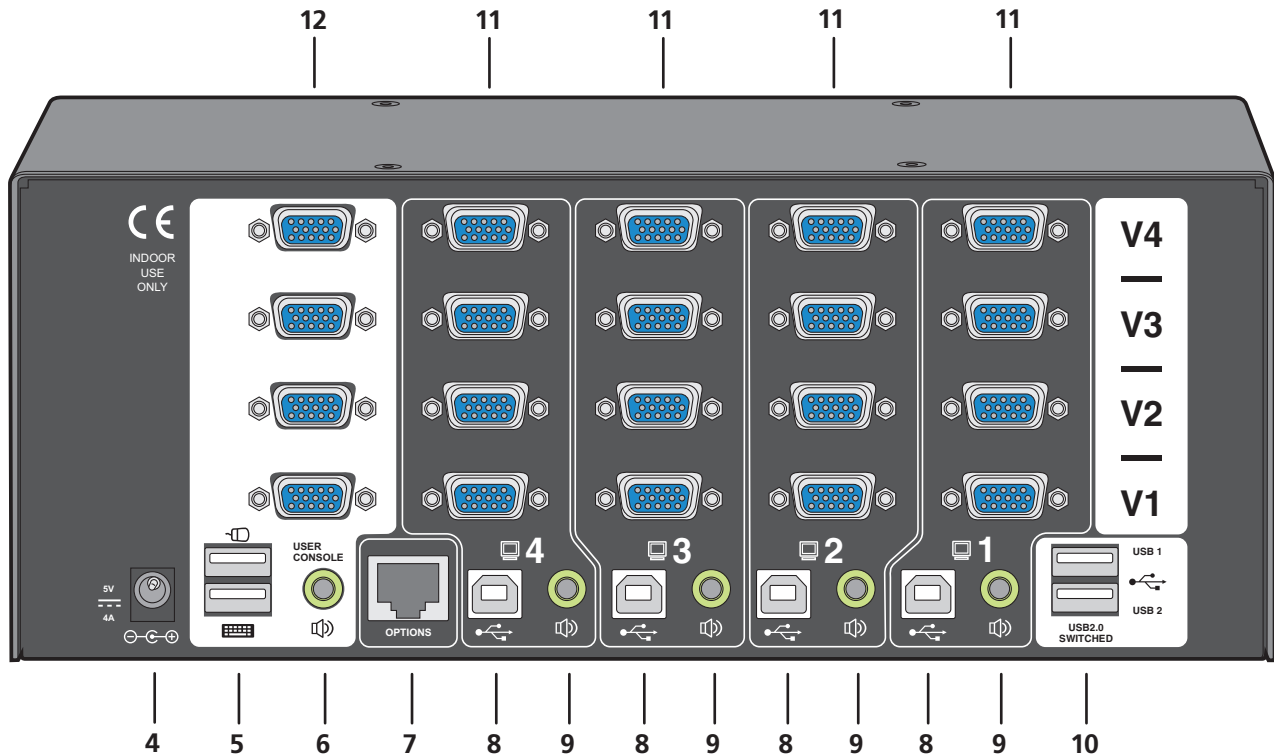Figure 2-5 shows the rear panel of the unit. Table 2-4 describes its components:

Figure 2-5. Rear panel.

Table 2-4. Rear panel components.

Number	Component	Description
4	2.5-mm Barrel connector	Power input or power supply connects here.
5	(2) USB Type A connectors	Connect the console's USB keyboard and mouse to these connectors.
6	3.5-mm RCA connector	User console audio port: Connect optional speakers to this connector.
7	RJ-45 port	*Options port: This top 10p10c port is used to allow external control of channel switching and also to update the internal firmware when necessary by connectng to a computer.
8	(4) USB Type B connectors	Connect to a USB port on each computer.
9	(4) 3.5-mm RCA connectors	Connect to the speaker output socket on each computer (optional connection).
10	(2) USB Type A connectors	Connect to the console's USB 2.0 peripheral devices (optional connection).
11	(8, 12 or 16) VGA connectors	Connect to the video output ports of each computer.
12	(2, 3 or 4) VGA connectors	Connect to the console's video monitors to enable multiple video streams from each computer to be switched to up to four video monitors.

*NOTE: The OPTIONS port uses a 10p10c socket, which can accommodate both 10p10c connectors as well as the much more common 8p8c connectors, which are used on Ethernet leads and patch cables. The pin-outs for both types of connectors are listed in Appendix C.

3. Installation

3.1 Mounting

There are two main mounting methods:

• Via the (4) supplied self-adhesive rubber feet

• Via optional rackmount brackets (KV3004A model only) using RMK4007

Rack brackets (KV3004A model only)

The optional brackets (plus four screws), enable the unit to be secured within a standard rack slot. See Figure 3-1.
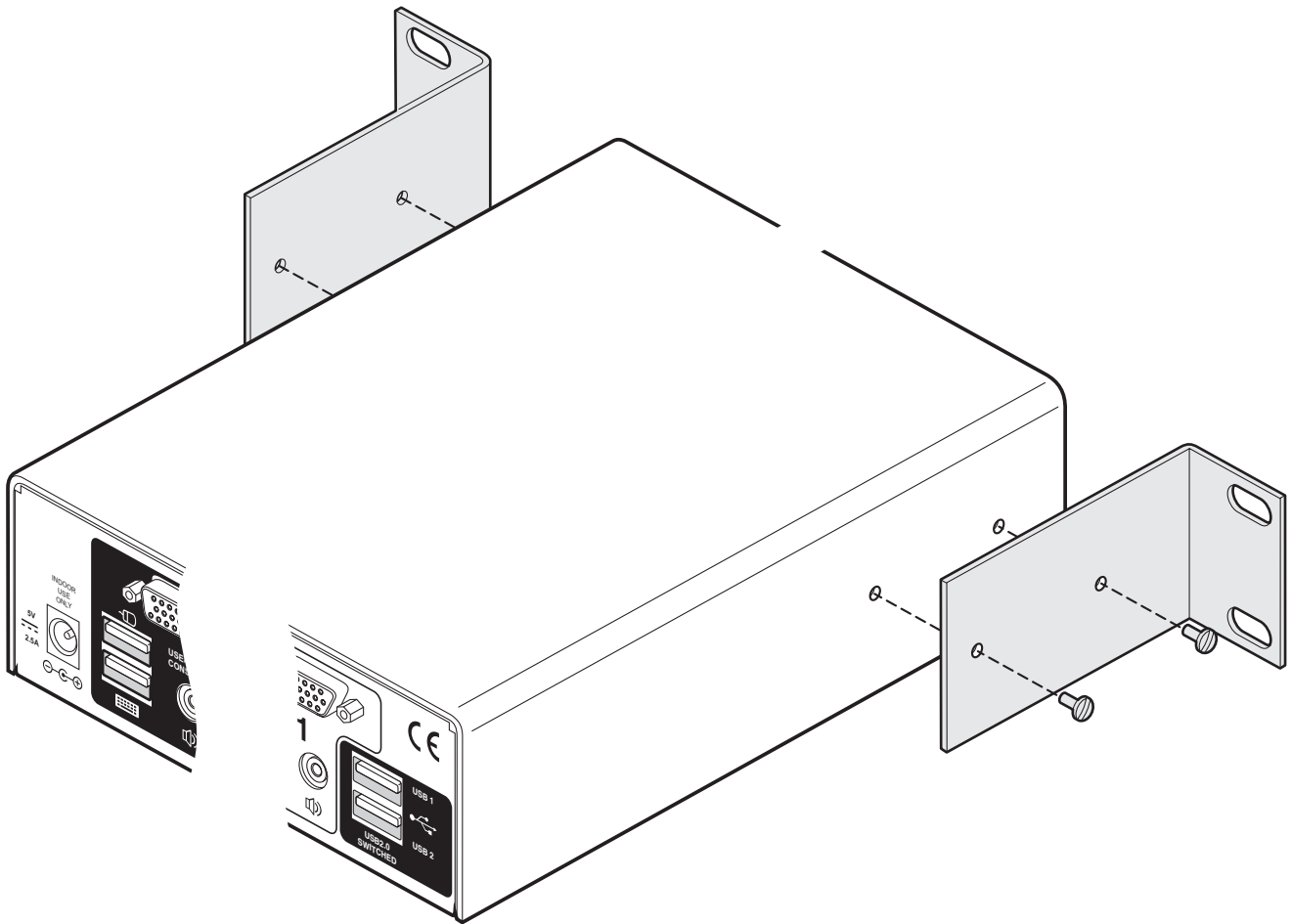

Figure 3-1. Rackmount brackets (KV3004A only).

NOTE: Both the ServSwitch Wizard VGA (USB) unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 104° F (40° C). Do not place the products in contact with equipment whose surface temperature exceeds 104° F (40° C).

3.2 Connections

Connections do not need to be carried out in the order given within this guide, however, where possible connect the *power in* as a final step.

3.2.1 User console

The ports that make up the user console are where you attach the peripherals that will be shared between the computer systems. Ensure that power is disconnected from the unit.

To connect peripherals to the user console

1 Position your peripheral devices in the vicinity of the unit such that their cables will easily reach.

2 Keyboard and mouse: Attach the leads from your USB keyboard and mouse to the USB sockets specifically labeled with keyboard and mouse symbols. The keyboard and mouse will operate in any of the USB sockets, however, True Emulation is not available on sockets labelled USB1 or USB2. See Figure 3-2.
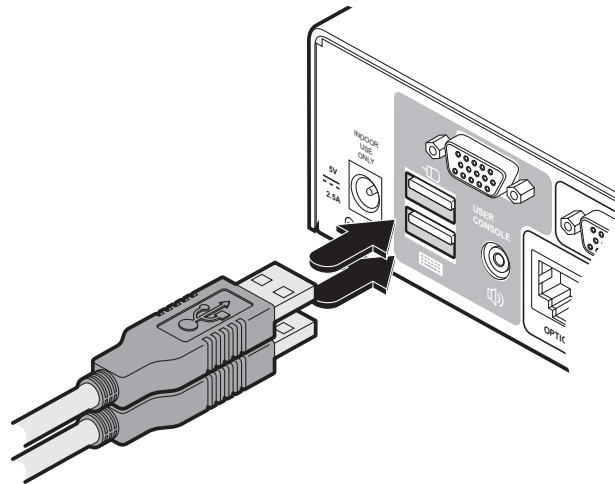

Figure 3-2. Connecting the keyboard/mouse to the user console.

3 USB devices: Where required, attach the leads from your USB peripherals to the USB sockets labelled USB1 and USB2. See Figure 3-3.
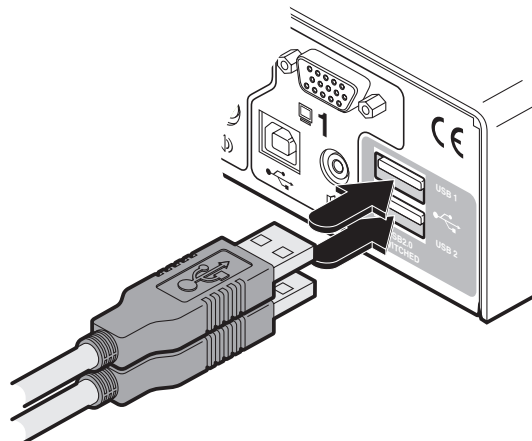

Figure 3-3. Connecting USB peripherals to the user console.

4 Video monitor(s): VGA video ports are used throughout.

Single screen units: Attach the lead from the video monitor to the VGA connector of the user console area. See Figure 3-4.
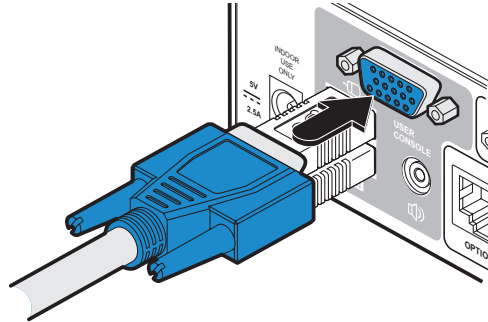

Figure 3-4. Connecting a video monitor to the user console.

Multiscreen units: Attach the lead from each video monitor to a VGA connector of the user console area. See Figure 3-5.
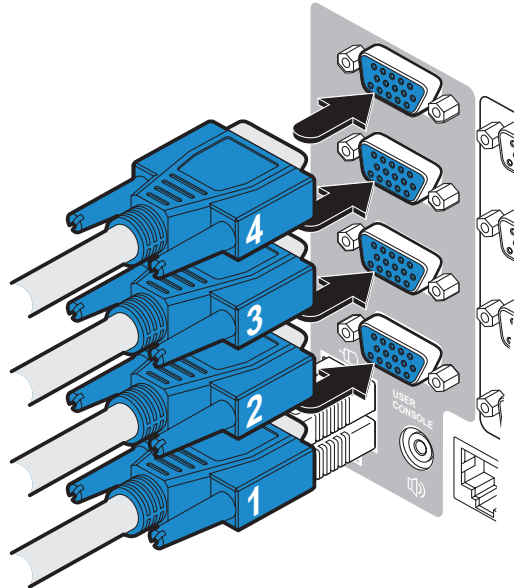

Figure 3-5. Connecting multiple video monitors to the user console.

Note: On the rear panel of the unit, the connectors at each horizontal level (V1 to V4) will be switched through to the user console VGA connector which is at the same level.

5 Audio: Where required, connect the lead from your speakers to the audio socket. See Figure 3-6.
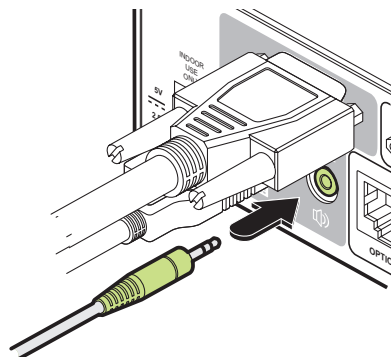

Figure 3-6. Connecting speakers to the user console.

3.2.2 Computer systems

Each computer system is connected to the ServSwitch Wizard VGA (USB) unit using up to three cables for the KV3004A and up to six cables for the KV3204A, KV3304A and KV3404A.

To connect a computer system

1 Ensure that power is disconnected from the ServSwitch Wizard VGA (USB) unit and the system to be connected.

2 Use a USB cable (type-A to type-B) to link a USB port on the computer system to the USB port of the required channel on the rear of the unit. See Figure 3-7.
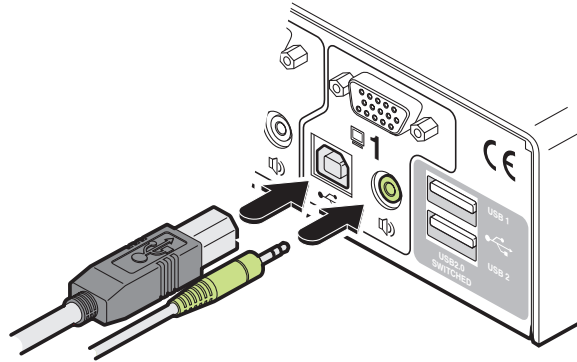

Figure 3-7. Connecting the USB and speaker leads from a computer to the ServSwitch Wizard VGA (USB) unit.

3 If required, use a stereo audio link cable (3.5-mm jacks at either end) to link the speaker port on the computer system to the audio port of the required channel on the rear of the unit. See Figure 3-7.

4 *Single screen units:* Link the video output of the computer's graphic port to the VGA port of the required channel on the rear of the unit. See Figure 3-8.
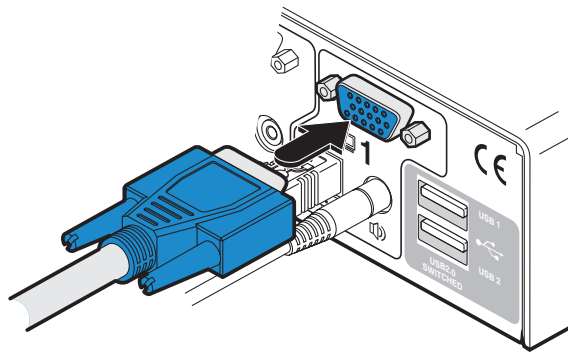

Figure 3-8. Connecting the video lead
from a computer to a VGA input port.

During initial power up, the Wizard unit will attempt to read the EDID information from the connected display(s). See Section 3.2.6 for details.

Multiscreen units: Link the video outputs of each computer to the VGA ports on the rear of the unit (see note below). See Figure 3-9.
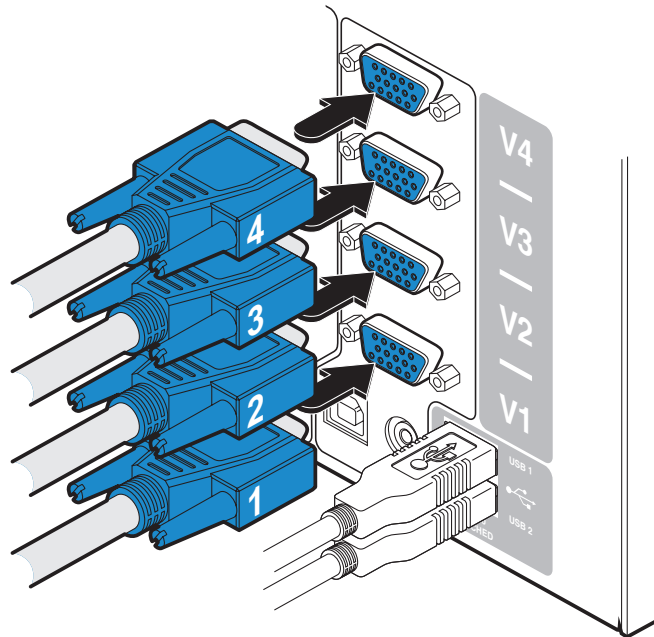
Figure 3-9. Connecting video leads from multiple computers to the VGA input ports.

On the rear panel of the unit, connectors belonging to the same channel are stacked vertically. The connectors at each horizontal level (V1 to V4) will be switched through to the user console VGA connector which is at the same level. See Figure 3-10.
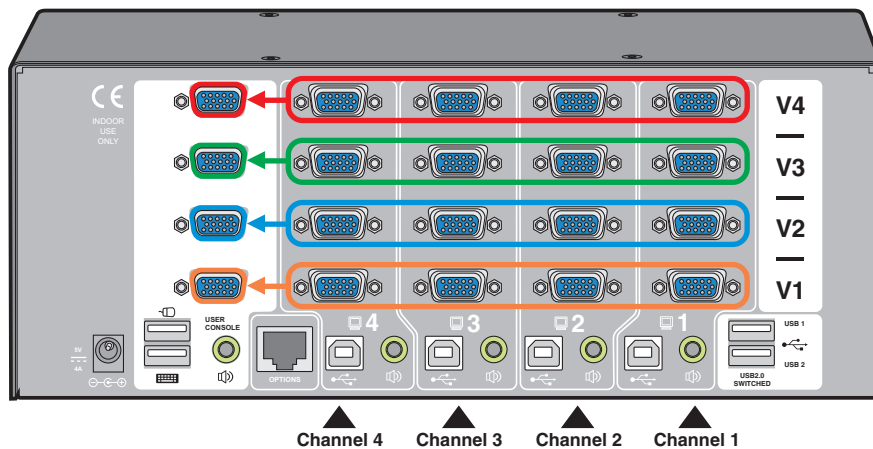

Figure 3-10. How the video inputs on the channels are directed to the video outputs in the User Console section

3.2.3 Power in connection

The ServSwitch Wizard VGA (USB) unit is supplied with either a 12.5W (single screen version) or 20W (Multiscreen versions) power adapter. There is no on/off switch on the unit, so operation begins as soon as a power adapter is connected.

To connect the power supply

1 Attach the output lead from the power adapter to the 5v socket on the rear panel of the unit. See Figure 3-11.
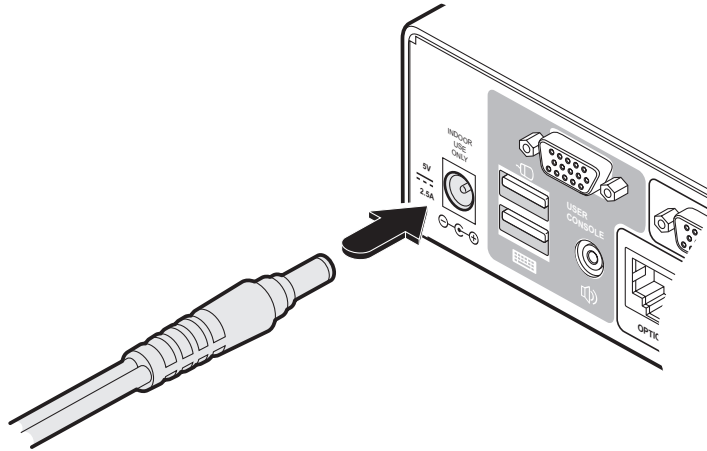
Figure 3-11. Attaching the power adapter lead to the power input socket.

2 Connect the IEC connector of the supplied country-specific power lead to the socket of the power adapter. See Figure 3-12
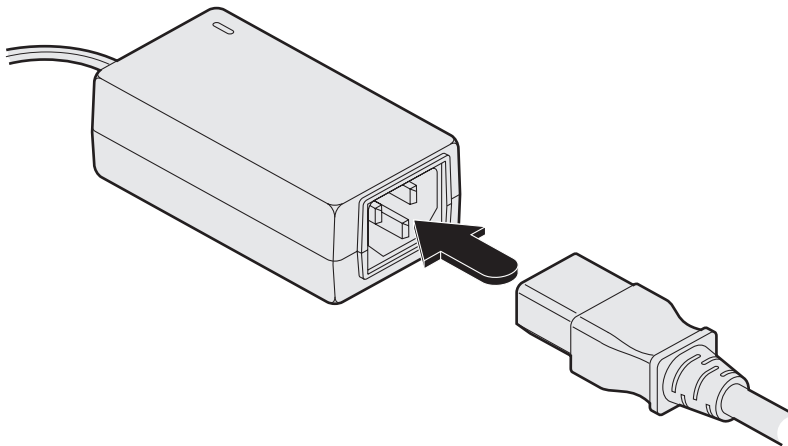
Figure 3-12. Attaching the IEC connector of the power lead to the adapter.

3 Connect the power lead to a nearby main supply socket.

Note: Both the unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 104° F (40° C)*. Do not place the products in contact with equipment whose surface temperature exceeds* 104° F (40° C)*.*

3.2.4 Channel switching by external control

The OPTIONS port allows external control of the current channel by commands sent either via RS-232 serial input or by switching one of the four channel select input lines. For more details about the necessary RS-232 serial cable, see Appendix C.

3.2.4.1 OPTIONS port pinout

The OPTIONS port can accept either 8p8c or 10p10c connectors, as required. See Figure 3-13.

8p8c	10p10c	Signal
	1	Channel select input 1
1	2	5VDC power output (100mA max)
2	3	GND reference for all signals
3	4	RS232 (RXD) data receive
4	5	RS232 auxiliary data transmit (reserved)
5	6	RS232 auxiliary data receive (reserved)
6	7	RS232 (TXD) data transmit
7	8	Channel select input 2
8	9	Channel select input 3
	10	Channel select input 4

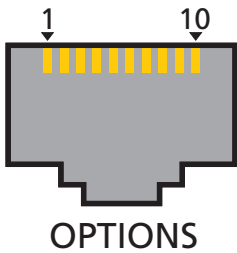Figure 3-13. Signal and power pin-outs on the OPTIONS port

To connect a computer or device for remote control

1 Insert the 8p8c or 10p10c connector of the cable to the OPTIONS port on the rear panel of the unit. See Figure 3-14.
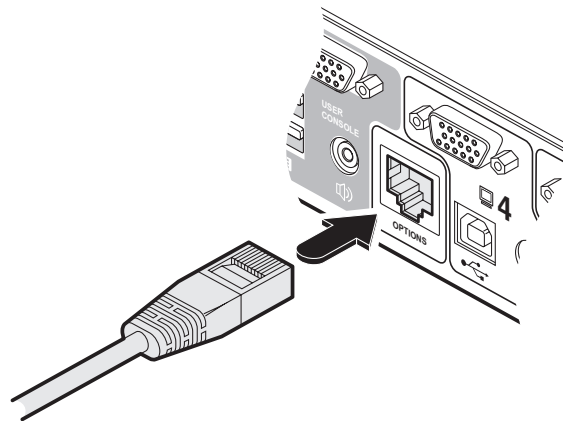

Figure 3-14. Link cable to the OPTIONS port on the rear panel.

2 Connect the other end of the cable to a vacant serial port on the computer or to the output of the switching device.

3.2.4.2 Control by RS-232 serial

Where the external control is via RS-232 signal, ensure that the configuration menu option **O** is set to **1** or **3** to enable RS-232 control.

Serial port parameter settings

Ensure that the chosen serial port is configured to the following:

- Baud rate: To match setting of **B** option in the Configuration menu (default is 1200).

- Data bits: 8

- Stop bit: 1

- Parity: None

Serial port channel selection codes

	ASCII Character	Hex	Decimal
• Channel 1:	'1'	0x31	49
• Channel 2:	'2'	0x32	50
• Channel 3:	'3'	0x33	51
• Channel 4:	'4'	0x34	52

Note: As each channel is chosen using the above RS-232 commands, the peripherals that will be transferred are determined by the current setting of the switching mode.

3.2.4.3 Control by channel select input lines

Where the external control is via the four channel select input lines of the OPTIONS port (see pin out opposite), ensure that the configuration menu option **O** is set to **3** to enable the input lines.

The four input lines are suitable for connection to dry contacts or open collector style outputs. Connecting an input line to GND will cause the ServSwitch Wizard VGA (USB) to switch all of its functions to the selected channel:

- Channel 1:   Channel select input 1 low

- Channel 2:   Channel select input 2 low

- Channel 3:   Channel select input 3 low

- Channel 4:   Channel select input 4 low

If the input line is held low then all other switching requests by other means will be ignored until the line returns to a high (open) state.

If more than one logic input is low (closed) then the lower channel number takes priority.

Note: The input lines have only limited protection against over voltage.

3.2.5 Synchronizing multiple units

ServSwitch Wizard VGA (USB) units can be connected together so that they operate in a synchronized manner. Thus, two KV3004A units can be made to switch two video heads in a similar manner to an KV3204A. Additionally, two KV3204A units could be made to resemble an KV3404A, while two KV3404A units could be combined in order to switch up to eight video heads simultaneously.

Whenever an ServSwitch Wizard VGA (USB) channel is switched, it sends an RS232 command out on its serial interface (marked OPTIONS on the rear panel). A ServSwitch Wizard VGA (USB) unit will switch its channel if it receives the same command on its serial interface. Consequently, by linking the serial interfaces, a master unit may be made to automatically switch one or more slave units as shown in Figure 3-15.

It should be noted that the synchronization cable deliberately does not have the transmit pin of the Slave End connector linked to the receive pin of the Master End connector. To do so would cause the Slave unit to be able to switch the Master unit. This would setup an endless cyclical switching sequence that would prevent the ServSwitch Wizard VGA (USB) devices from operating correctly. For more details about the serial synchronization cables, see Appendix C.
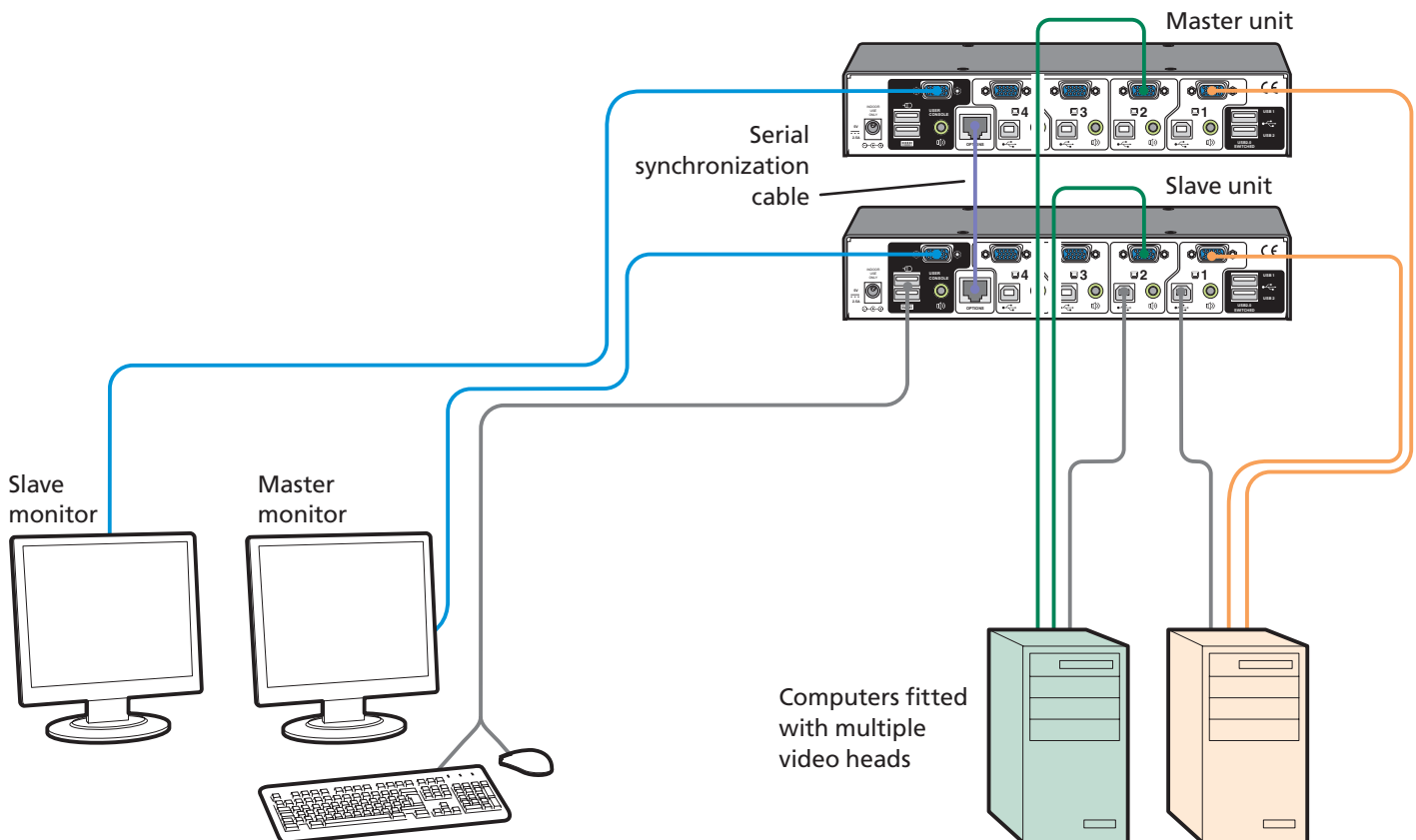

Figure 3-15. Connections for synchronizing two units

3.2.6 Managing EDID video display information

Whenever a ServSwitch Wizard VGA (USB) unit is powered on (or when the option **F 2** is selected from the configuration menu), it will interrogate the connected monitor(s) to determine whether EDID (Extended Display Identification Data) information is available. If EDID information is available, it will be copied and used; otherwise a default set of data, stored within the ServSwitch Wizard VGA (USB), will be substituted. You can also optionally choose to prevent the unit from seeking new EDID information and instead rely only on stored data.

EDID Emulation

The ServSwitch Wizard VGA (USB) units use an *EDID Emulation* feature to ensure that the collected EDID information (up to two pages) is correctly supplied to every connected computer, whether it is currently selected or not. See Figure 3-16.
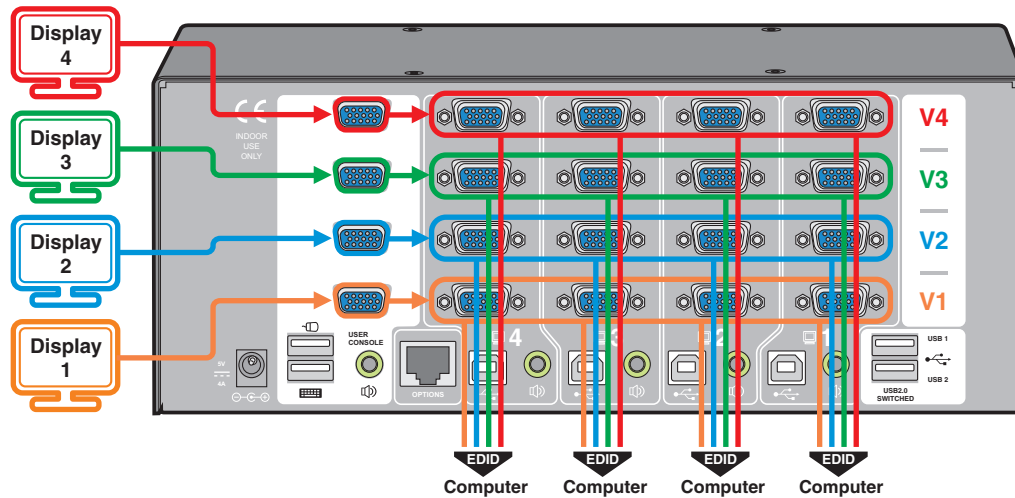
Figure 3-16. How EDID information is disseminated across the computers

3.2.6.1 Refreshing EDID information during use

You can refresh the EDID information from the connected monitor(s) without the need to power cycle the ServSwitch Wizard VGA (USB).

To refresh EDID information during use

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the Functions menu

3 Press **2** and then **Enter**.

4 Press **E** and then **Enter** to exit the menu.

3.2.6.2 Using stored EDID information only

You can choose to prevent the unit from interrogating the video display(s) during startup. When you invoke this option, the unit will only use the EDID information that it has already stored and pass this on to the connected computers. To revert to interrogating the video display, use the **F 2** function discussed above.

To use the stored EDID information at the power up

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the **Functions** menu

3 Press **3** and then **Enter**.

4 Press **E** and then **Enter** to exit the menu.

4. Configuration

4.1 Using the Configuration Menu

The configuration mode allows you to determine numerous aspects of the ServSwitch Wizard VGA (USB) unit capabilities.

To use the configuration menu

During normal use, the seven segment display on the front panel shows the number of the currently selected computer channel. From this condition, enter configuration mode as follows:

1 Press and hold the front panel COMPUTER button for roughly five seconds.
   The display will show: **C**

2 On the keyboard, press the letter key for the required menu section, e.g. **S** (see Table 4-1 for full list of options)
   The display will show the pressed letter.

3 Press the number of the required setting, e.g. **4**
   The display will show the pressed number.

4 Press **Enter** to accept the setting and return to the main menu section.
   The display will show: **C**

5 You can now continue with your next configuration change (go to step 2), or exit from the configuration menu (see below).

To exit the configuration menu and save changes

• Press **E** and then press **Enter** to exit and save changes.

To exit the configuration menu without saving

• Press either of the front panel buttons.

Table 4-1. Configuration menu options

Letter	Number	Description
B		Enter the OPTIONS port Baud rate menu
	1	1200 (default)
	2	2400
	3	9600
	4	19200
	5	38400
	6	57600
	7	115200
F		Enter the Functions menu
	1	Show current firmware version
	2	Refresh EDID information from the connected video display (default)
	3	Use the stored EDID at startup, do not interrogate the video display
	8	Reset configuration to factory defaults (r is displayed momentarily)
H		Enter the Hotkey menu
	1	Ctrl + Alt (default)
	2	Ctrl + Shift
	3	Alt + Shift
	4	Right Alt
	5	Alt
	6	Left Ctrl + Alt
	7	Right Ctrl + Alt
	8	Hotkeys disabled
O		Enter the Options port behavior menu
	1	Channel switching via RS-232 serial control (using the baud rate set by the 'B' option). Contact switching via the Options port disabled. (default)
	2	Channel switching via remote. Contact switching disabled (reserved for future use).
	3	As per **1** but with contact switching enabled.
P		Set a new password for use with the lock mode
S		Enter the Switch Mode menu
	1	All (default)
	2	KVM + Speaker
	3	KVM only
	4	Speaker only
	5	USB1 only
	6	USB2 only
T		Enter the Autoscan Time Delay menu
	1	Autoscan disabled
	2	2 seconds
	3	5 seconds (default)
	4	7 seconds
	5	15 seconds
	6	30 seconds
	7	1 minute
	8	5 minutes
U		Enter the User Preferences menu
	1	Enable mouse switching (default)
	2	Disable mouse switching
	7	Cycle all ports (when using 'Hotkey + Tab' or 'Autoscan') (default)
	8	Cycle only active ports (when using 'Hotkey + Tab' or 'Autoscan')

4.2 General configuration

4.2.1 Changing hotkeys

ServSwitch Wizard VGA (USB) units use **CTRL** and **ALT** *as their standard hotkeys. These can be changed if they clash with other software or hardware within the installation.*

To change the hotkeys

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **H** to enter the **Hotkey** menu and then press either:

   1 to choose **Ctrl + Alt**

   2 to choose **Ctrl + Shift**

   3 to choose **Alt + Shift**

   4 to choose **Right Alt**

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.2.2 Mouse switching

You can enable or disable mouse switching to suit your installation requirements.

To enable/disable mouse switching

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **U** to enter the **User Preferences** menu and then press either:

   1 to **Enable mouse switching**

   2 to **Disable mouse switching**

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.2.3 OPTIONS port speed

You can change the speed of the OPTIONS serial port.

To change the OPTIONS port speed

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **B** to enter the **Baud rate** menu and then press either:

   1 to choose **1200**

   2 to choose **2400**

   3 to choose **9600**

   4 to choose **19200**

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.2.4 OPTIONS port channel control behavior

You can determine how the OPTIONS port responds to channel control inputs.

To define the OPTIONS port behavior

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **O** to enter the **Options port** menu and then press either:

1 to allow channel switching commands to be received via RS-232 serial signal through the OPTIONS port (see Appendix C for cable pin-out details and see Section 3.2.5 Channel switching by external control for command details). The baud rate currently set by the **B** option will be used for the port. Switching commands via the four channel select inputs within the OPTIONS port connector are disabled in this mode. Use option **3** if you wish to enable the channel select inputs in addition to RS-232 control.

3 enables channel switching via RS-232 as per option **1**. However, in this mode the four channel select inputs are also enabled.

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.2.5 Switching mode

Using the configuration menu, you can define a default switching mode. The switching mode determines which peripherals (KVM, USB1, USB2 and/or speakers) should be moved to the next computer when it is selected using any of the standard methods. *Regardless of the default switching mode set here, during use you can always change the mode using either the MODE button (on the front panel) or using the additional hotkey press combinations.*

Note: Of the external switching methods, the RS-232 serial signal input will switch the peripherals as defined by the currently selected switching mode. However, switching control initiated by the channel select input lines will always switch all of the peripherals to the chosen channel regardless of the switching mode.

To set the default switching mode

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **S** to enter the **Switch Mode** menu and then press either:

1 to select **All** (default)

2 to select **KVM and speaker**

3 to select **KVM only**

4 to select **Speaker only**

5 to select **USB1 only**

6 to select **USB2 only**

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.2.6 Miscellaneous functions

To refresh EDID information from the monitor

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the **Functions** menu

3 Press **2** and then **Enter**.

4 Press **E** and then **Enter** to exit the menu and save changes.

To use the stored EDID information at the power up

When you engage this mode, the unit will not interrogate the video display during startup and will instead use the data that are stored. To revert to interrogating the video display, use the F 2 function discussed above.

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the **Functions** menu

3 Press **3** and then **Enter**.

4 Press **E** and then **Enter** to exit the menu and save changes.

To reset configuration to factory defaults

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the **Functions** menu

3 Press **8** and then **Enter**. The display will show **r** momentarily.

4 Press **E** and then **Enter** to exit the menu and save changes.

To show the current firmware version

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **F** to enter the **Functions** menu

3 Press **1** and then **Enter**.

   The display will blank for a short while and then the major number of the firmware revision will be shown. The display will blank again and then show the first digit of the minor number. Following another blank, the second digit of the minor number will be displayed. e.g. *<blank> 1 <blank> 0 <blank> 2 <blank> equals v1.02*

4 Press **E** and then **Enter** to exit the menu and save changes.

To set a new password

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **P** and then **Enter**. The display will show **:**

3 Enter a new password and then **Enter**. See 5.2 Locking Access to the Computers.

4 Press **E** and then **Enter** to exit the menu and save changes.

4.3 Performing upgrades

The ServSwitch Wizard VGA (USB) unit is fully upgradable via flash upgrade. Such upgrades require a Windows-based computer system to be linked via the OPTIONS port.

Items required to perform an upgrade

- Optional upgrade cable (see Appendix C for pin-out specifications).

- A Windows-based upgrade computer with an RS232 serial port.

- The latest version of the KVM Firmware Uploader and firmware files for the ServSwitch Wizard VGA (USB) unit (available from Black Box Technical Support—call 724-746-5500 or send an e-mail to info@blackbox.com).

To use the KVM Firmware Uploader utility

1 Download the latest ServSwitch Wizard VGA (USB) unit KVM Firmware Uploader from Black Box Technical Support and install it on a Windows based upgrade computer that will be connected to the ServSwitch Wizard VGA (USB) unit. The files are supplied as a compressed ZIP file. Decompress the ZIP file with an appropriate tool such as WinZip (www.winzip.com) and copy all contained files to the same folder on the upgrade computer.

2 Remove the power supply plug from the rear panel of the unit.

3 Connect the serial port of the upgrade computer to the OPTIONS port on the rear panel of the unit using the optional upgrade cable. There is no need to adjust the computer's serial port settings as the application will do this automatically.

4 While powering on or when already powered: Press and hold the COMPUTER and MODE buttons (for up to ten seconds) until the numeric indicator shows '**U**'.

5 From the folder created/used in step 1, select the KVMUploader file/icon to run the upgrade utility. The KVM Firmware Uploader dialog will be displayed:
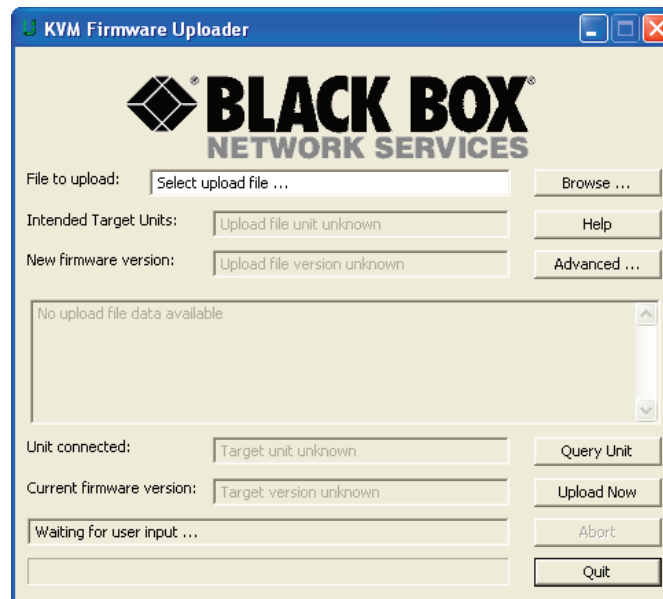

Figure 4-1. KVM Firmware Uploader utility screen.

6 Click the *Query Unit* button to confirm that communication is possible with the ServSwitch Wizard VGA (USB) unit and to establish its firmware details. If successful, the 'Unit connected' field should show the name of the ServSwitch Wizard VGA (USB) unit and the current firmware will also be listed.

If the application cannot contact the ServSwitch Wizard VGA (USB) unit, re-check the connection cable and click the *Advanced...* button to check that the correct serial port is being used. Change the serial port within the *Advanced...* section, if necessary.

7 From the main KVM Firmware Uploader dialog, click the *Browse...* button and select the upgrade file:

VGAUSB_xxx.txt

where xxx is the firmware version.

The upgrade file details will be displayed within the dialog.

IMPORTANT: Check that the 'Intended Target Units' field matches the 'Unit Connected' field. If these fields do not match then you may have an incorrect upgrade file, check with Black Box Technical Support before proceeding. Check also that the 'New firmware version' is greater than the 'Current firmware version'. See Figure 4-2.
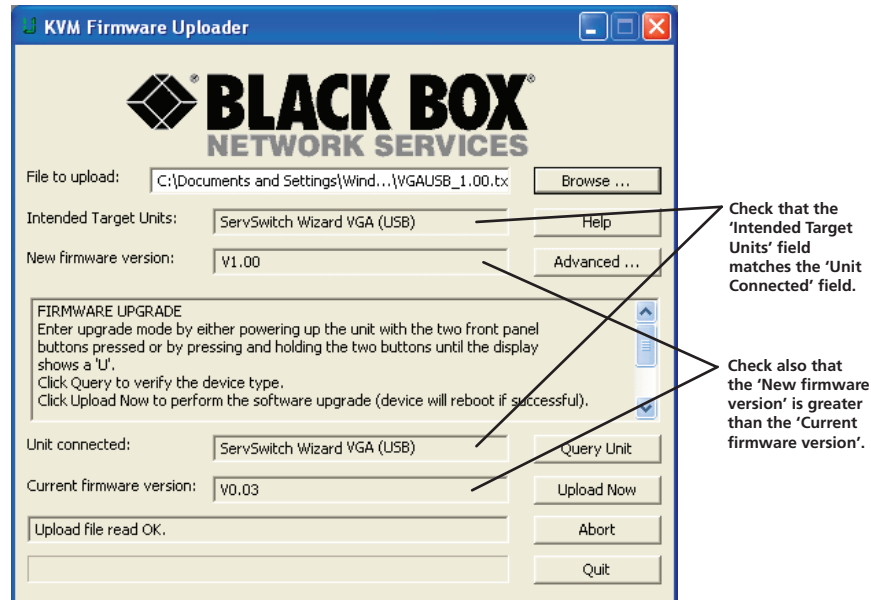

Figure 4-2. KVM Firmware Uploader utility screen with upgrade file selected.

8 To begin the upgrade process, click the *Upload Now* button. The progress will be shown within the dialog. Should you decide not to continue with the upload at any stage, click the *Abort* button; response to this is usually immediate, however, during an erase command, the upload will not be aborted until the erase is complete (this may take a few seconds).

9 Disconnect the power. When the power is re-applied the ServSwitch Wizard VGA (USB) unit will operate using the new firmware.

Issues to consider when performing flash upgrades

The upgrade program rewrites the internal firmware code. If the upgrade process is interrupted then the unit will have invalid code and will not be able to operate. It is therefore good practice to ensure that the upgrade process is always fully completed. A partial or failed upgrade may be rectified by performing another upgrade.

WARNING: Running faulty or partially upgraded code may have unpredictable results and may damage your ServSwitch Wizard VGA (USB) unit or computing equipment.

5. Operation

5.1 Selecting a computer

There are four main ways to switch the common peripherals to specific computer channels:

- Using the front panel controls (see below)

- Using hotkeys

- Using mouse button presses

- Using external switching control (RS-232 or input lines)

5.1.1 Selecting a computer using the front panel

The front panel allows you to determine how the various peripherals are switched to one or more computer channels.
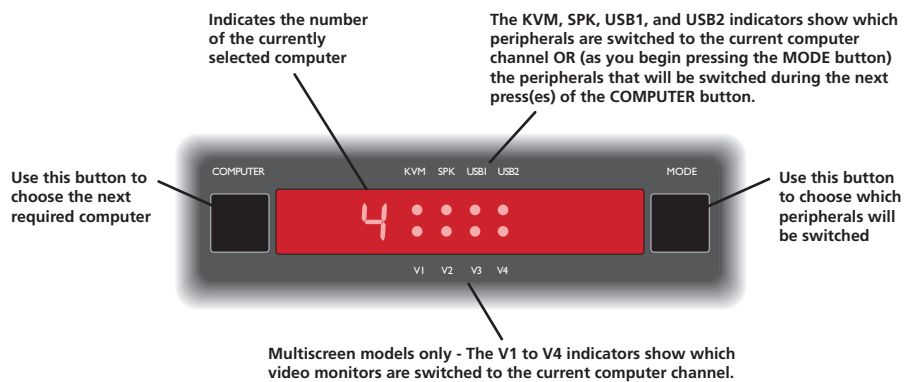
Figure 5-1. Front panel buttons and indicators.

To select a computer using the front panel

1 Optional: If you need to selectively switch some of your peripherals, press the MODE button repeatedly to change the switching mode:

Figure 5-2. Changing the switching mode using the MODE button.

Note: If an indicator flashes, it signifies that the respective peripheral is currently switched to another computer channel.

2 Press the COMPUTER button repeatedly to select the required computer channel.

5.1.2 Selecting a computer using hotkeys

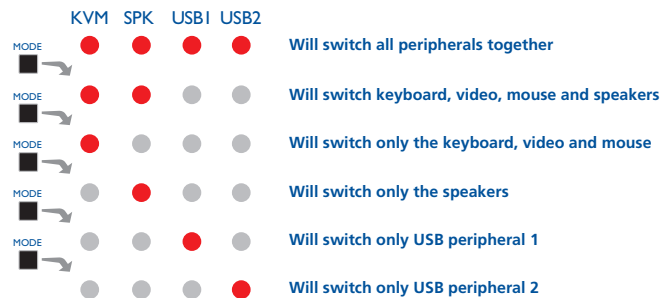Using hotkey combinations, you can quickly switch the keyboard, video monitor(s), mouse and speakers and USB peripherals to any computer channel.

There are two mains ways to use hotkeys: **Standard** and **Additional**.

To use standard hotkey press combinations

The standard hotkey press combinations allow you to change channels with the minimum of keypresses:

1 Simultaneously press and hold **CTRL** and **ALT** (or other hotkeys, if altered).

2 While still holding **CTRL** and **ALT**, press the number key of the required channel address (or the **TAB** key), then release all of the keys.

Note: The numbers on your keyboard's numeric keypad are not valid, use only the numeral keys above the QWERTY section.

The ports (KVM, audio and/or USB) that are switched using this method depend upon the switching mode that is currently set using the front panel buttons.

The range of standard hotkey combinations are as follows:

Note: If your hotkeys have been changed, substitute them for **CTRL** and **ALT** in the examples given here.

CTRL ALT 1	Selects channel 1
CTRL ALT 2	Selects channel 2
CTRL ALT 3	Selects channel 3
CTRL ALT 4	Selects channel 4
CTRL ALT 0	Isolates the user console from all channels
CTRL ALT TAB	Selects the next channel (see note below)

***Choosing which computers are accessed when using hot keys + tab**showed*

The computer channels that are visited when you use the hot keys + tab (or mouse buttons/autoscan) are determined by a setting within the Configuration menu:

1 *Enter the Configuration menu (see Section 4.1 for details).*

2 *Press **U** and then press either:*

    *__7__ to choose **Cycle all ports**, or*

    *__8__ to choose **Cycle only active ports***

3 *Press **Enter** to accept the setting and return to the main menu section.*

4 *Press **E** and then **Enter** to exit the menu and save changes.*

To use additional hotkey press combinations

In addition to the standard hotkey press combinations (shown left), you can also add additional keypresses in order to determine which peripherals are switched:

1 Simultaneously press and hold **CTRL** and **ALT**.

2 Press and release a command key:

   A *to switch all peripherals*

   K *to switch only the keyboard, video and mouse*

   S *to switch only the speakers*

   U *to switch only USB1 and USB2*

3 Press and release the required channel number (**1** to **4** using only the keys above the QWERTY section).

4 Release **CTRL** and **ALT**.

   The appropriate peripherals will change to the chosen channel.

   Note: Regardless of which peripherals were switched, the front panel indicators will continue to show the switching mode that was last determined using the front panel controls.

5.1.3 Selecting a computer using the mouse buttons

Using the mouse buttons, you can quickly switch the keyboard, mouse, video monitor(s), speakers and/or USB peripherals to any computer channel.

Note: These procedures work only with three-button or IntelliMouse devices and only if the 'Mouse Switching' option has been enabled.

To select a computer using the mouse buttons

1 Hold down the middle button (or scroll wheel) of the mouse.

2 Click the left mouse button to increment the channel number or click the right mouse button to decrement the channel. When the correct channel is reached, release the middle button.

   When using this method of switching:

   • The computer channels that are visited depend upon the configuration menu setting (see note below).

     Choosing which computers are accessed when using mouse buttons

     The computer channels that are visited when you use the mouse buttons (or hotkeys + tab/autoscan) are determined by a setting within the Configuration menu:

     1 Enter the Configuration menu (see Section 4.1 for details).

     *2 Press **U** and then press either:*

        *7 to choose **Cycle all ports**, or*

        *8 to choose **Cycle only active ports***

     *3 Press **Enter** to accept the setting and return to the main menu section.*

     *4 Press **E** and then **Enter** to exit the menu and save changes.*

   • The ports (KVM, audio and/or USB) that are switched using this method depend upon the switching mode that is currently set using the front panel buttons.

5.2 Locking access to the computers

When privacy is required, you can lock access to the connected computers via the unit.

To lock the unit

1 Simultaneously press and hold **CTRL** and **ALT** (or other hotkeys, if altered).

2 While still holding **CTRL** and **ALT**, press **L**.

The display will show **P** (providing a valid password has been previously set). You will not be able to access any computers until the password is correctly entered.

To unlock the unit

• When prompted, enter the correct password and press **Enter**.

To set a new password

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **P** and then **Enter**. The display will show **:**

3 Enter a new password and then **Enter**.

The password is not case sensitive and can be any combination of key strokes, including the function keys, but excluding the Num Lock, Caps Lock, Scroll Lock and Enter keys. If your keyboard has special media keys, these also cannot be used as part of the password.

When you have typed in your password, press **Enter** to store it. Don't worry if you type the password incorrectly, you can always re-enter configure mode and set the password again.

4 Press **E** and then **Enter** to exit the menu and save changes.

To cancel the password

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **P** and then **Enter**. The display will show **:**

3 Press **Enter** to remove the existing password.

4 Press **E** and then **Enter** to exit the menu and save changes.

If you forget the password

To clear an existing password: Connect the OPTIONS port of the unit to the serial port of a computer and transmit the text **clrpwd** to the unit.

5.3 Autoscanning

When enabled, the autoscan mode switches between the connected computers in sequence. This is useful to allow you to sample activity among the connected computers.

Two scanning modes are available:

- *Cycle all ports* – This mode visits, in turn, to each connected computer. This mode should be used with care due to the reasons given in the warning below. To prepare for this autoscan mode, choose **U 7** within the configuration menu.

- *Cycle only active ports* – Only computer ports where an active computer is detected will be viewed. This mode avoids blank screens from being displayed and helps to prevent the viewing monitor from entering a power-down state on every scan cycle.

   Additionally, when this mode is selected, whenever you use either the mouse buttons or hot keys + tab to change channels, only computers that are active will be visited. To prepare for this autoscan mode, choose **U 8** within the configuration menu.

   WARNING: Many monitors are fitted with automatic power saving relays that switch off after a few seconds when connected to an inactive computer. If you are using such a monitor, do not use the 'Cycle all ports' mode. Continual switching on and off of the monitor's relay will eventually damage the monitor.

Seven autoscan periods are available (the time spent viewing each computer) ranging from 2 seconds to 5 minutes. To prepare the autoscan period, choose **T** and then **2** to **8** within the configuration menu.

To start autoscanning mode, press **CTRL ALT X** on the keyboard.

To select an autoscan mode

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **U** and then press either:

   - **7** to choose **Cycle all ports**, or
   - **8** to choose **Cycle only active ports**

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

   Note: The setting of this option also affects which computers are visited when the channel is changed using the mouse buttons or hot key + tab.

To select an autoscan period

1 Enter the Configuration menu (see Section 4.1 for details).

2 Press **T** and then press either:

   1 to choose **Autoscan disabled**,

   2 to choose **2 seconds**,

   3 to choose **5 seconds**,

   4 to choose **7 seconds**,

   5 to choose **15 seconds**,

   6 to choose **30 seconds**,

   7 to choose **1 minute**, or

   8 to choose **5 minutes**.

3 Press **Enter** to accept the setting and return to the main menu section.

4 Press **E** and then **Enter** to exit the menu and save changes.

To start autoscanning

• On the keyboard, press **CTRL ALT X**.

Notes:

During autoscanning, mouse switching, hot key + tab and interactivity with the computers are all disabled.

During autoscanning, only the KVM and speaker ports are switched to each visited computer channel, the two USB device ports remain connected to their currently selected channels.

To stop autoscanning

You can stop the autoscanning process in either of the following ways:

• Press the COMPUTER button on the front panel, or

• Select a specific channel using the hot keys + channel number.

Appendix A. What is True Emulation?

True Emulation represents a significant breakthrough in sharing USB devices between two or more computer systems. Until this point, the problem has been how to create a USB switch that provides all of the following:

• Quick, transparent and reliable switching,

• Accurate representation of the connected USB keyboard and mouse,

• Switching control via the connected USB keyboard and/or mouse.

The difficulty in achieving all of the above requirements has been due to the complexity of the USB standard. This has led to various problems that have spawned a number of possible solutions.

A.1 Enumerated USB switching

The earliest attempts to switch USB devices applied a relatively 'hands off' approach. Enumerated USB switches are the electronic equivalent of those old mechanical KVM switches with a large knob on the front.

Enumerated switches are so called because a connected USB device will be required to perform a full initiation (a process called *Enumeration*) every time it is switched; just as if you had pulled out the plug and then reconnected it.

Enumerated switches simply pass all signals straight through between the USB device and the computer, they do not attempt to interpret any data. For most devices, this offers an advantage because the switch just leaves them to get on with their jobs without any interference or any hit on performance. However, it means that a USB keyboard or mouse cannot be used to control the switching process - a quick and simple control method expected by most users. Reliability of switching is also an issue that has plagued enumerated switches, especially when used with certain USB devices and particular operating systems.

A.2 Emulated USB switching

The issues with interpreting the complex USB data streams and recreating (or *Emulating*) the identity of attached USB devices were eventually solved, leading to the creation of the Emulated USB switch.

A neat side effect of the technique used is that each computer can be fooled into thinking that the USB device is permanently connected to it, even when the device is switched to another computer. This means that the enumeration process for the USB device takes place only once, during the first power on. After that, a computer merely sees a dormant version of the USB device whenever the device is actually connected to a different computer.

However, it remains a complex task to dynamically assume the identity of a USB device, distribute it among the connected computers and maintain all of the necessary signals, states and processes. Therefore, manufacturers have previously relied upon a fixed keyboard and mouse profile that is declared to each computer, regardless of the actual connected devices. This precluded the use of any special keyboard or mouse features over and above the standard layouts.

A.3 True Emulation

Mindful of the limitations associated with the previous USB switching techniques, we set about creating a more effective and elegant solution. After a great deal of research and development, *True Emulation* is the result.

True Emulation allows the complete identity of the keyboard and mouse to be copied and then presented to all of the connected computers. This means that any keyboard offering specialist function keys or any mouse with extra features will be fully supported at each computer. As with the previous emulation method, the unselected computers will continue to see the identities of the keyboard and mouse, which means that no enumeration is necessary when their link becomes active once again. This not only helps to speed up the rate of reconnection, but also raises the reliability of switching because USB links are at their most vulnerable during the enumeration process.

True Emulation relies upon a high speed circuit, called an Emulation Engine, to fully emulate the USB device identities and also interpret keyboard and mouse data streams. The result is full support for KVM switching control via hotkey presses or the third button/scroll wheel of a mouse.

True Emulation is not necessarily required by other USB devices, which is why you will also find two enumerated circuits included (shown in green within the block diagram) alongside the True Emulation feature (shown in blue). This allows those other USB devices to operate at their highest speeds, without any intervention. The enumerated circuits benefit greatly from the USB Hubs that are jointly used with the True Emulation system. Because they interface directly and permanently with each computer, they help to stabilize the dormant links, making errors during enumeration much less likely.

The dual switching arrangement provides further flexibility because the True Emulation and enumerated sections can be switched in unison or independently of each other, as required. Thus, your various peripherals can operate with different computers at the same time.
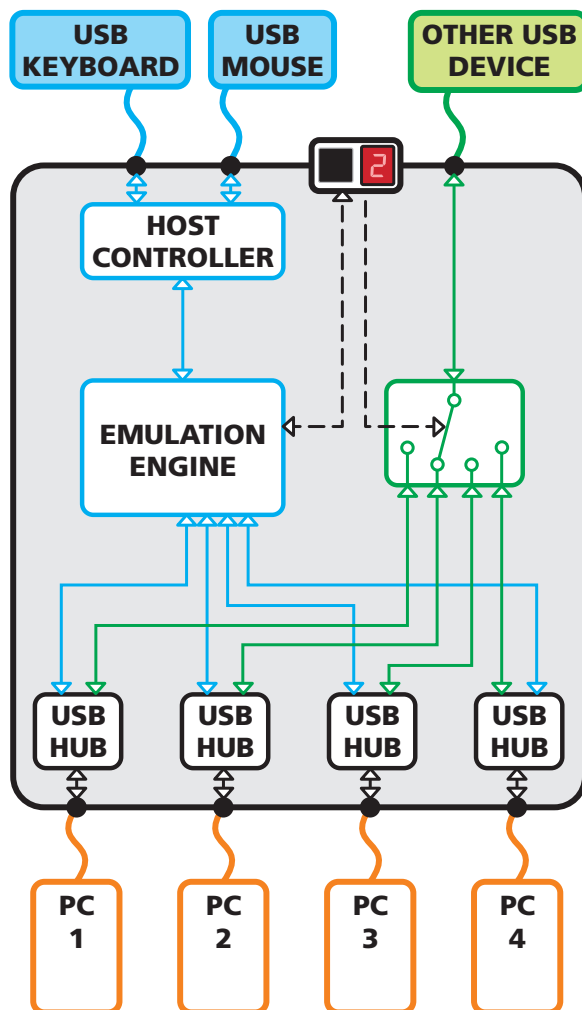

Figure A-1. True Emulation functional block diagram. The emulated section of the switch is shown in blue and handles only the keyboard and mouse. The green enumerated section of the switch handles other USB devices and also uses the USB hubs to link with the computers.

Appendix B. Default EDID video modes

The following digital video modes are defined within the default EDID information held by the ServSwitch Wizard VGA (USB) units. This information is used only if no new EDID information is made available by the attached video monitor(s). The ServSwitch Wizard VGA (USB) units support video resolutions and refresh rates in excess of those listed here.

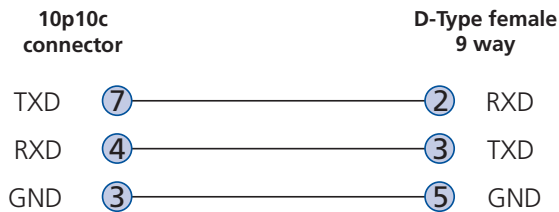|	
1024 x 768p at 60Hz	Native/preferred timing
720 x 400p at 70Hz	IBM VGA
720 x 400p at 88Hz	IBM XGA2
640 x 480p at 60Hz	IBM VGA
640 x 480p at 67Hz	Apple Mac II
640 x 480p at 72Hz	VESA
640 x 480p at 75Hz	VESA
800 x 600p at 56Hz	VESA
800 x 600p at 60Hz	VESA
800 x 600p at 72Hz	VESA
800 x 600p at 75Hz	VESA
832 x 624p at 75Hz	Apple Mac II
1024 x 768i at 87Hz	IBM
1024 x 768p at 60Hz	VESA
1024 x 768p at 70Hz	VESA
1024 x 768p at 75Hz	VESA
1280 x 1024p at 75Hz	VESA
1152 x 870p at 75Hz	Apple Mac II
1600 x 1200p at 60Hz	VESA STD
1680 x 1050p at 60Hz	VESA STD
1360 x 765p at 60Hz	VESA STD
1360 x 768p at 60Hz	
1440 x 900p at 60Hz	VESA STD
1280 x 720p at 60Hz	VESA STD
1920 x 1080p at 60Hz	VESA STD

Appendix C. Cable pin-outs

The OPTIONS port uses a 10p10c socket which can accommodate both 10p10c connectors as well as the much more common 8p8c connectors, which are used on Ethernet leads and patch cables. The pin-outs are listed in this section for both types of connector.
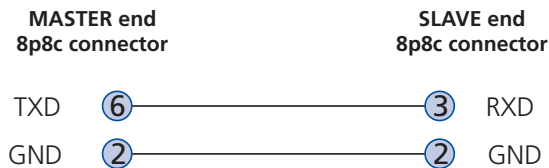
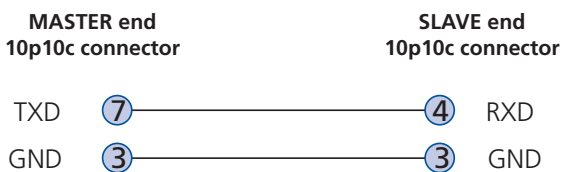## Serial remote control and flash upgrade cable (8p8c)

8p8c connector			D-Type female 9 way
TXD	⑥ ——————— ②	RXD
RXD	③ ——————— ③	TXD
GND	② ——————— ⑤	GND
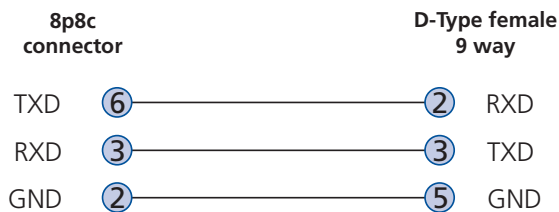
Serial remote control and flash upgrade cable (10p10c)

10p10c connector			D-Type female 9 way
TXD	⑦ ——————— ②	RXD
RXD	④ ——————— ③	TXD
GND	③ ——————— ⑤	GND

Multi-head synchronization cable (8p8c)

MASTER end 8p8c connector			SLAVE end 8p8c connector
TXD	⑥ ——————— ③	RXD
GND	② ——————— ②	GND

Multi-head synchronization cable (10p10c)

MASTER end 10p10c connector			SLAVE end 10p10c connector
TXD	⑦ ——————— ④	RXD
GND	③ ——————— ③	GND

Appendix D. Safety information

- For use in dry, oil free indoor environments only.

- Both the ServSwitch Wizard VGA (USB) unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade.

- Warning - live parts contained within power adapter.

- No user serviceable parts within power adapter - do not dismantle.

- Plug the power adapter into a socket outlet close to the module that it is powering.

- Replace the power adapter with a manufacturer approved type only.

- Do not use the power adapter if the power adapter case becomes damaged, cracked or broken or if you suspect that it is not operating properly.

- If you use a power extension cord with the ServSwitch Wizard VGA (USB) unit, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure that the total ampere rating of all the devices plugged into the wall outlet does not exceed the wall outlet's ampere rating.

- Do not attempt to service the ServSwitch Wizard VGA (USB) unit yourself.

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