BLACK BOX®
NETWORK SERVICES

ServSwitch™ Freedom

Control up to four computer systems and their displays, and share peripherals among them.

Now with Glide and Switch automatic switching technology.

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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 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:
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 and channel switching commands

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
Consumption: 12.5 watts

Size: 1.5"H (1U) x 3.46"W x 9.0"D (3.8 x 8.8 x 23 cm)

Weight: 1.74 lb. (0.79 kg);

2. Overview

2.1 Introduction

The ServSwitch™ Freedom is a compact unit created to allow a single operator to access information and control operations across numerous systems and screens. With the ServSwitch Freedom unit, you can use a single USB keyboard and USB mouse to fulfill functions that previously required four separate sets. This provides immediate savings in both desk space and also the time required to access and control up to four systems and screens. The ServSwitch Freedom features our True Emulation technology (see Appendix B), which ensures that the full characteristics of the connected USB keyboard and mouse are passed to every system.

In addition to switching the keyboard and mouse, the ServSwitch Freedom can also share a set of speakers and two separate USB peripherals between the four systems. This can be done either in concert with the keyboard and mouse (and each other) or totally independently.

The ServSwitch Freedom unit can be used in combination with various Black Box extender products (such as the Wizard SRX ACU5501A) to extend the distance between the user and the computers under control.

Switching between the systems connected to the ServSwitch Freedom can be achieved in five different ways:

- The innovative Glide and Switch automatic switching utility (see Appendix B),
- The COMPUTER button on the top panel,
- Keyboard hotkey combinations,
- Mouse button combinations,
- Remote control by another device*.

Where additional feedback is required as to which systems and screens are selected at any time, the optional ServSwitch Freedom LED Monitor kit provides discreet stick-on LED monitor indicators. When a system/screen is selected, a corresponding LED monitor indicator illuminates (in a choice of colors) to confirm the action.

The video displays are connected directly to their respective systems as usual. A single USB link (plus an optional speaker connection) is made between each system and the ServSwitch Freedom unit.
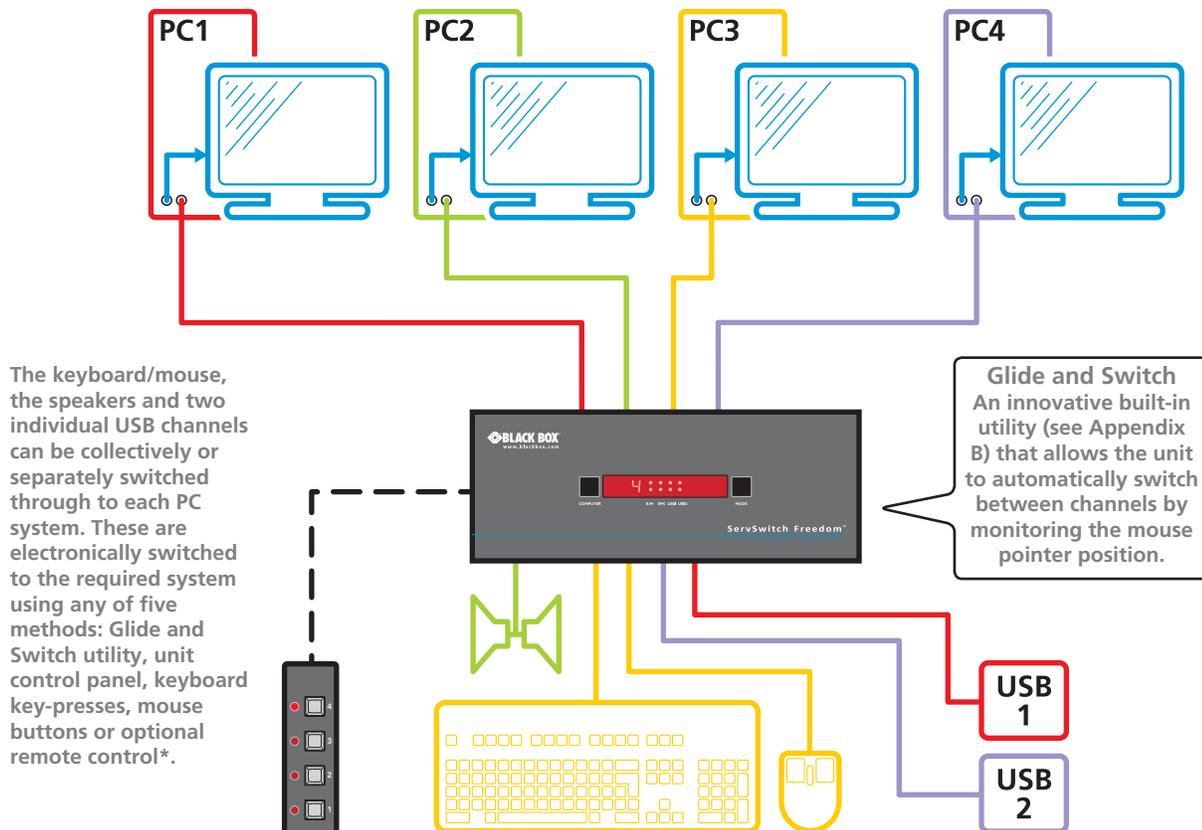

Figure 2-1. Overview of the ServSwitch Freedom.

* The optional remote control may not available as a stocked item in all countries.

2.2 Features

Multiple screens, multiple systems

The ServSwitch Freedom unit allows you to control up to four individual computer systems and their display screens using just one keyboard and mouse set. You can also share two further USB peripherals between the systems.

Multiple channel switching options

You have a choice of five different ways to switch between the various system/display channels including control by mouse buttons, keyboard hotkeys, the unit front panel, optional remote control by another device or using our Glide and Switch technology – more on this below.

Automatic channel switching with Glide and Switch technology

Our patent pending Glide and Switch technology allows the ServSwitch Freedom unit to determine the precise moment that you wish to change between channels by monitoring the mouse pointer movements. All switching intelligence is fully contained within the unit, no extra software utilities are required on your mission critical computer 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 Freedom 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.

Compact size

The ServSwitch Freedom is contained within a sturdy yet compact metal case which can easily be concealed within the cable flows behind your desk.

Optional channel indicators

The ServSwitch Freedom LED Monitor kit provides individual indicator modules that make it easy to see which display screen is currently selected.

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 Freedom unit

• Power adapter and power cord

• Flash upgrade adapter

• (4) Self-adhesive feet

2.4 Additional Items You May Need

• ServSwitch Freedom LED Monitor kit with four stick-on indicators and cables (P/N: KV0004A-LED)

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

• 3.5mm Audio cable (P/N: EJ110)

2.5 Hardware Description

2.5.1 Top Panel

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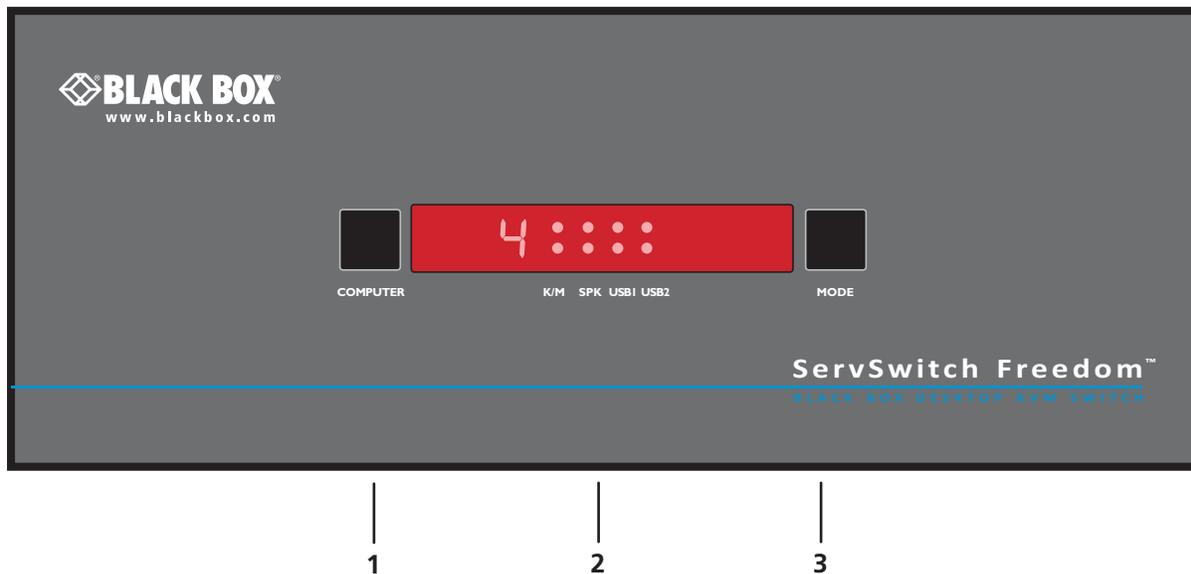
Figure 2-2. Top panel.

Table 2-1. Top panel components.

Number	Component	Description
1	COMPUTER button	Press to change to the next computer channel.
2	Indicators	The lower four indicators (K/M, 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 upper four indicators scroll across at regular intervals whenever the Glide and Switch channel switching system is enabled.
		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:
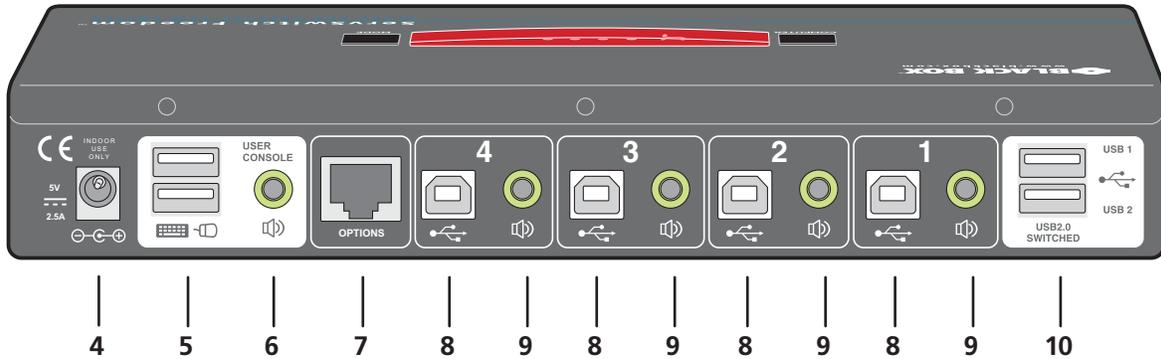
Figure 2-3. Rear panel.

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).

*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 Locations

Please consider the following important points when planning the position of the ServSwitch Freedom unit:

• Situate the ServSwitch Freedom unit close to the systems to which it will be connected and near to a power outlet.

• Thanks to the optional remote control, the ServSwitch Freedom unit can be situated out of sight within the cabling cradle of a desk or placed adjacent to the connected systems.

• Consult the precautions listed within the Safety information section.

3.2 Mounting

Before you begin connecting to the keyboard, mouse and source systems, it is advisable to mount the ServSwitch Freedom unit in place, either:

• On a horizontal surface using the supplied self adhesive feet, or

• Among the cabling at the rear of the desk.

NOTE: Both the ServSwitch Freedom 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).

3.3 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.

3.3.1 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 so 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 labeled USB1 or USB2. See Figure 3-1.
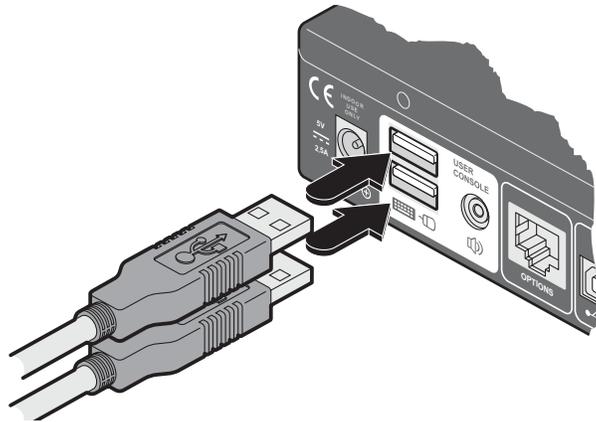

Figure 3-1. Connecting the keyboard/mouse to the user console.

3. USB devices: Where required, attach the leads from your USB peripherals to the USB sockets labeled USB1 and USB2. See Figure 3-2.
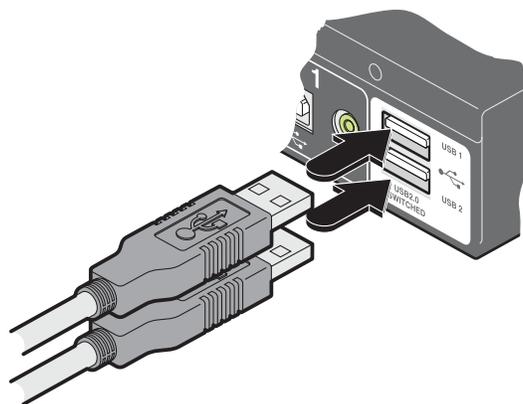
Figure 3-2. Connecting USB peripherals to the user console.

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4. Audio: Where required, connect the lead from your speakers to the audio socket. See Figure 3-3.
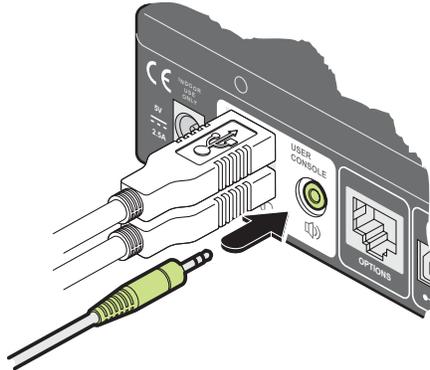
Figure 3-3. Connecting speakers to the user console.

3.3.2 Computer systems

Each computer system is connected to the ServSwitch Freedom unit using (up to) two cables.

To connect a computer system

1. Ensure that power is disconnected from the ServSwitch Freedom 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 3-4.
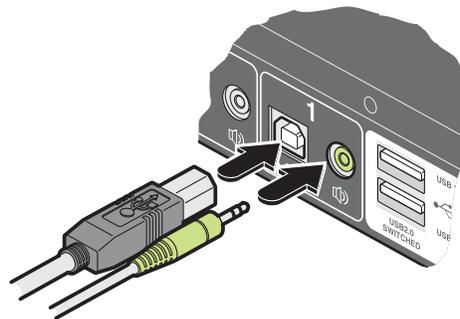
Figure 3-4. Connecting the USB and speaker leads from a computer to the ServSwitch Freedom unit.

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 3-4.

3.3.3 Power in connection

The ServSwitch Freedom unit is supplied with a 12.5W 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 3-5.
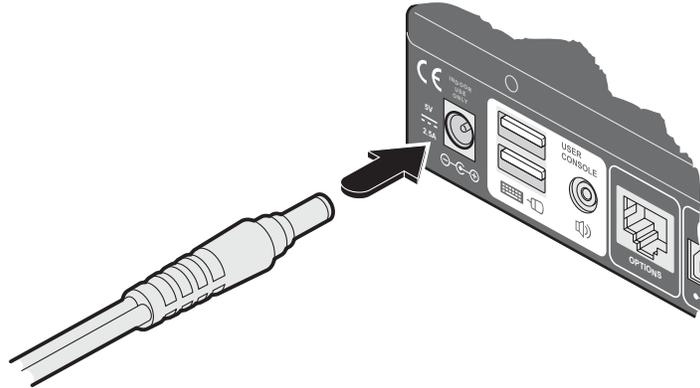
Figure 3-5. Attaching the power adapter lead to the power input socket.

2. Connect the IEC connector of the supplied country-specific power lead to the socket of the power adapter. See Figure 3-6.
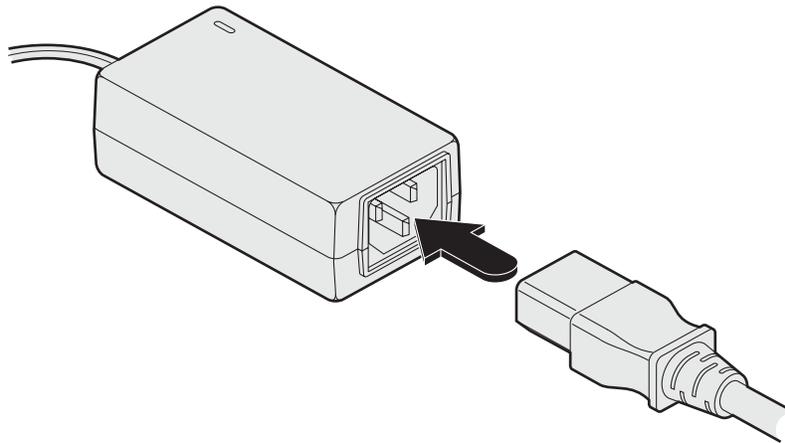
Figure 3-6. Attaching the IEC connector of the power lead to the adapter.

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).

3.3.4 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.

3.3.4.1 OPTIONS port pinout

The OPTIONS port can accept either 8p8c or 10p10c connectors, as required. See Figure 3-7.
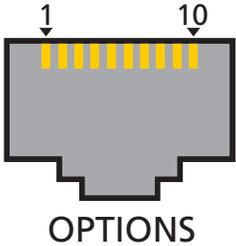
8p8c	10p10c	Signal
	1	Channel select input 1
1	2	5VDC power output (100mA max)
2	3	GND reference for all signals
3	4	RS-232 (RXD) data receive
4	5	RS-232 auxiliary data transmit (reserved)
5	6	RS-232 auxiliary data receive (reserved)
6	7	RS-232 (TXD) data transmit
7	8	Channel select input 2
8	9	Channel select input 3
	10	Channel select input 4

Figure 3-7. Signal and power pin-outs on the OPTIONS port.

To connect a computer or device for remote control

The cable link from the computer needs to connect the transmit (TXD) line of the computer to the receive (RXD) input of the unit and also link the ground terminals (GND) of the two devices. See Appendix C for details.

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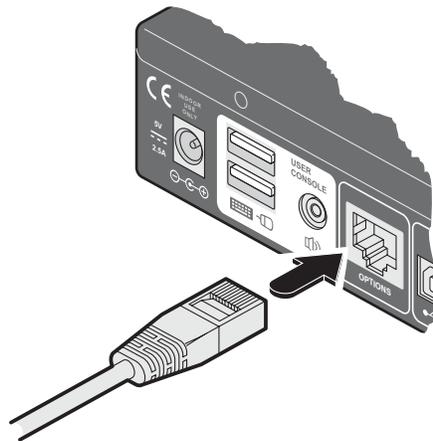
Figure 3-8. Link cable to the OPTIONS port on the rear panel.

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

3.3.4.2 Control by RS-232 serial

Serial port parameter settings

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

- Baud rate: 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.

3.3.5 Optional LED indicator connections

The optional ServSwitch Freedom LED Monitor module (part number: KV0004A-LED) enables you to add LED (Light Emitting Diode) indicators to each of your video display screens to show which are active.

Note: The ServSwitch Freedom switch requires firmware version 2.0 or later to be installed. Please see 4.7 Performing upgrades for details about how to check.

The optional ServSwitch Freedom LED Monitor module connects to the **OPTIONS** port of the main ServSwitch Freedom switch. Each individual LED monitor indicator then connects to one of the ten ports on the ServSwitch Freedom LED Monitor module.

Notes: The ServSwitch Freedom LED Monitor module MUST be connected before the switch is powered on, otherwise the module will not be recognized. Also, if the module is temporarily disconnected from the switch during operation, communication between the two will cease and the switch will need to be re-powered with the ServSwitch Freedom LED Monitor module attached.

Before operation of the LED indicators can occur, it is necessary to temporarily connect the ServSwitch Freedom switch to a Windows computer. This will allow you to use the Glide and Switch application to program the required operation of the switch. Please see 4.5 Configuring LED indicators for details about using the Glide and Switch configuration application.

3.3.5.1 To connect the ServSwitch Freedom LED Monitor module and indicators

1. Remove power from the switch. Use the flat cable supplied with the ServSwitch Freedom LED Monitor kit to link the module to the **OPTIONS** port of the ServSwitch Freedom switch. See Figure 3-9.
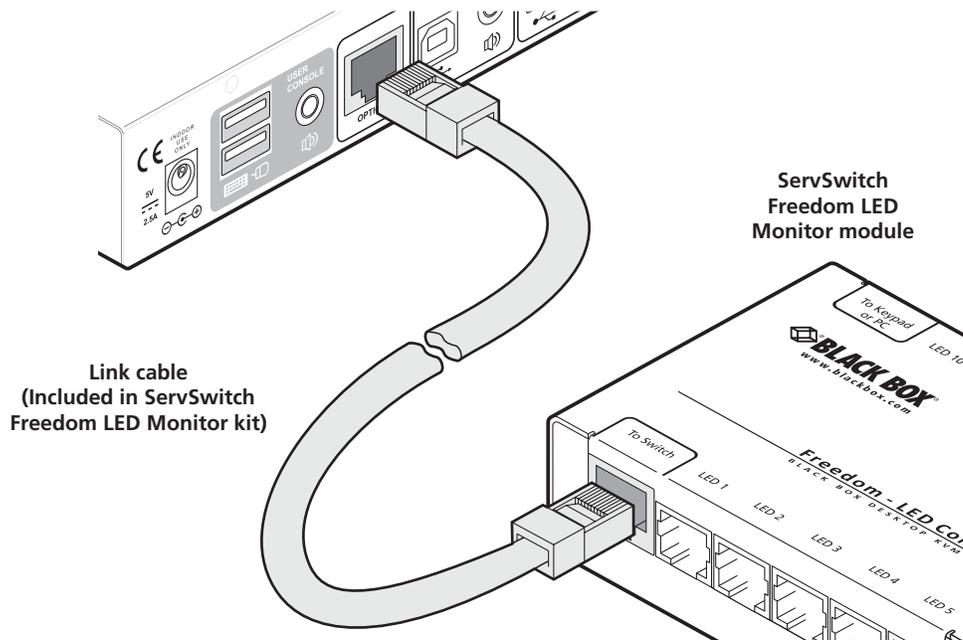
Figure 3-9. Linking the ServSwitch Freedom LED Monitor module to the ServSwitch Freedom switch.

2. Link each LED indicator to a port on the ServSwitch Freedom LED Monitor module - ports 1 to 4 are most commonly used. See Figure 3-10.

Note: The KV0004A-LED kit includes four LED indicator assemblies. Up to ten can be connected and additional LED indicators can be ordered using the part number: KV0004A-XTRA-LED.

Insert the lead for the first indicator into port 1

LED indicator with 3 metre lead

Port 2

Port 3

Port 4

Each indicator has a self adhesive Velcro tab to assist with mounting on your video displays.
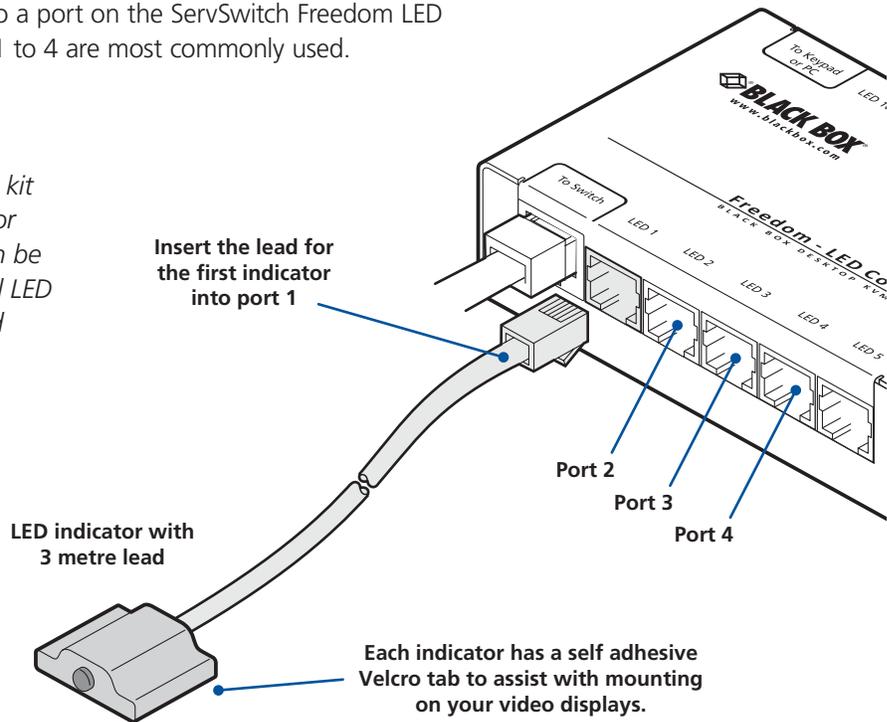
Figure 3-10. Linking LED indicators to the ServSwitch Freedom LED Monitor module.

3. You need to tell the ServSwitch Freedom LED Monitor which LED indicator to illuminate (and in which color) for each channel. To do this connect your computer to the **TO KEYPAD OR PC** port of the ServSwitch Freedom LED Monitor module (while it remains connected to the ServSwitch Freedom switch). Please see the section 4.5 Configuring LED indicators. See Figure 3-11.

Connect to a vacant serial port on your computer

Flash upgrade cable (Included in ServSwitch Freedom LED Monitor kit)

Note: If required, the PC connection can be removed once programming is complete.
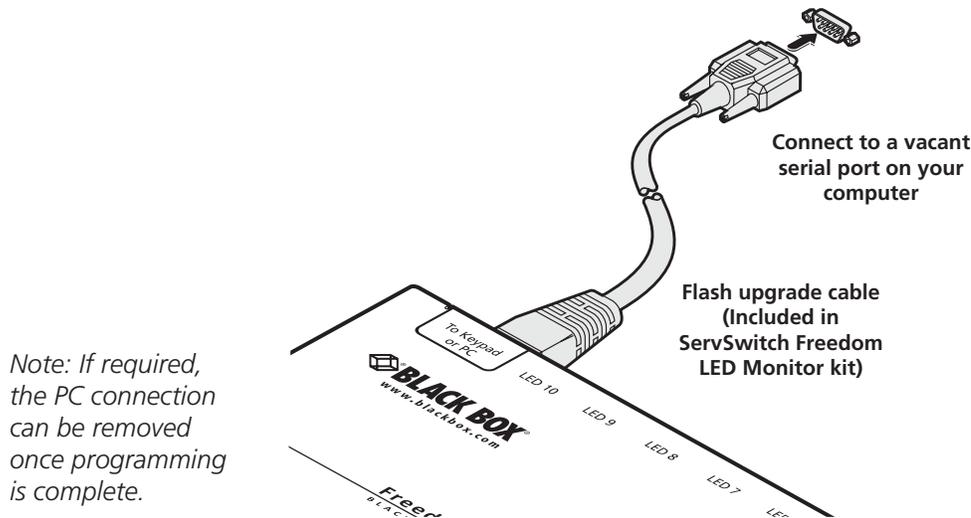
Figure 3-11. Linking the ServSwitch Freedom LED Monitor module to the serial port of a computer.

4. Apply power to the switch.

4. Configuration

4.1 Using the Configuration Menu

The configuration mode allows you to determine numerous aspects of the ServSwitch Freedom 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
	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
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
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 Freedom 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**	**5** to choose **Alt**
2 to choose **Ctrl + Shift**	**6** to choose **Left Ctrl + Alt**
3 to choose **Alt + Shift**	**7** to choose **Right Ctrl + Alt**
4 to choose **Right Alt**	**8** to disable the Hotkeys

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**	**5** to choose **38400**
2 to choose **2400**	**6** to choose **57600**
3 to choose **9600**	**7** to choose **115200**
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 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.

4.2.5 Miscellaneous functions

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 Section 5.2 Locking Access to the Computers.

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

4.3 Glide and Switch configuration

4.3.1 Installing the Glide and Switch configuration application

The Glide and Switch configuration application is available for download from the Black Box website. Go to the KV0004A product page and click on the 'Resources' tab.

1. Install the application onto any computer (not necessarily one of the four computers linked to the ServSwitch Freedom unit) that has a vacant serial port. Run the installation application and follow the on-screen instructions.

2. Use the supplied Flash Upgrade Adapter and any CAT5 patch cable to link the computer serial port to the ServSwitch Freedom OPTIONS port. If the optional ServSwitch Freedom LED Monitor module is connected to the **OPTIONS** port, then instead connect the upgrade cable between the computer serial port and the **TO KEYPAD OR PC** port of the ServSwitch Freedom LED Monitor module (see 3.3.5 Optional LED monitor indicator connections for details).

3. Start the configuration application.

4.3.2 Configuring the Glide and Switch system

Use the Glide and Switch configuration application to declare the display screens and their positions relative to each other. Then download the configuration to the ServSwitch Freedom unit.

1. On the icon bar, click the red, green, blue and yellow screen icons (or use the **Screens** menu) to add the required number of display screens to the map area. See Figure 4-1.
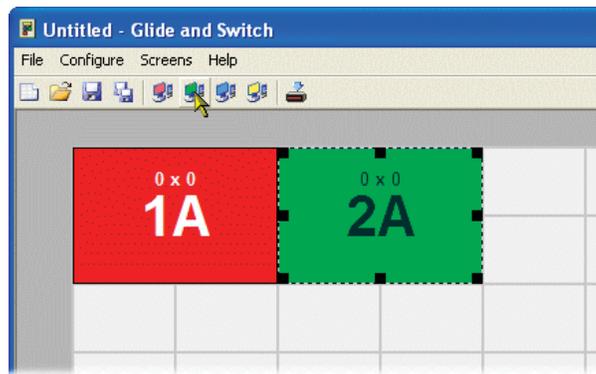

Figure 4-1. Adding display screens to the layout

2. Arrange the colored rectangular screen representations to mimic the physical layout of the actual displays. See Figure 4-2.

Figure 4-2. Example screen layouts

The important thing is to define where each screen edge abuts to the next so that the ServSwitch Freedom unit can determine the correct moments to switch channels.

Use the small black squares around the perimeter of each highlighted screen representation to change their size or stretch them.

Note: The numbering of the screen representations relate directly to the four channels on the ServSwitch Freedom unit.

3. Double-click on each screen representation to set the screen resolution and, optionally, add a screen name and/or configure an LED indicator (if used). See Figure 4-3.
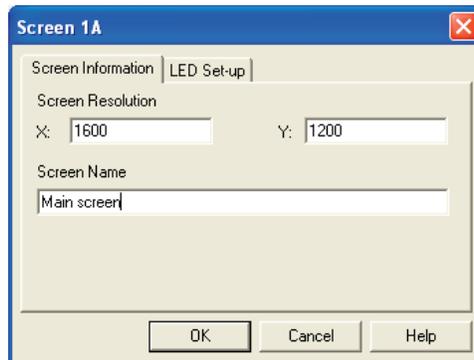

Figure 4-3. Defining the resolution of a screen and (optionally) a name

The screen resolutions are not critical but they enable the ServSwitch Freedom unit to accurately map the movement of the mouse onto corresponding movements of the pointer across the screens. The screen names, if used, are not downloaded to the ServSwitch Freedom unit.

If you need to configure an LED indicator, click the LED Setup tab. Please see 4.5 Configuring LED indicators for details.

4. When the screen map is complete and accurately matches the true layout of the display screens, click **File** and choose the **Save** option to store a copy of the layout. The layout will be stored as a 'Glide and Switch Config file' with the extension: **.ffc**

5. Ensure that the upgrade cable is correctly installed - see Section '4.3.1 Installing the Glide and Switch configuration application'.

Click the **Configure** menu and choose the **Connection...** option to ensure that the correct computer serial port is selected and that the Baud Rate matches that of the ServSwitch Freedom unit (1200 is the default speed).

6. To send the configuration, click the **Send Layout to Switch** option.

- If the download is successful, the screen representations will briefly turn gray and the upper four indicators on the ServSwitch Freedom unit will begin to scroll across (they will continue to do this while Glide and Switch mode is enabled).

- If the download is unsuccessful, a message dialog will explain that it is 'Unable to communicate with the device'. Check the upgrade cable, check that the correct serial port is selected and check that the connection speed shown within the utility matches the speed used on the ServSwitch Freedom unit.

7. IMPORTANT: Once the Glide and Switch configuration application has downloaded the setup, remove and reconnect power to the ServSwitch Freedom switch.

See 4.6 Optional Glide and Switch operations and settings

4.4 Multi-Monitor Glide and Switch configuration   (Windows only)

4.4.1 Installing drivers and multi-monitor config app

In order to use Multi-Monitor mode you will need to install a Multi-Monitor Glide and Switch driver (available for download from the Black Box website. Go to the KV0004A product page and click on the 'Resources' tab) onto each PC that has multiple monitors attached.

1. On each multiple monitor PC, run the downloaded file. After accepting the licence agreement you will be prompted to choose a destination folder. Either accept the suggested location or change it, as necessary.

   *Note: The **Install for all users** option should be ticked if there are more than one user account on the PC and all need to use Glide and Switch.*

2. The options available during installation are as follows:

   • **Full Install**, (this is recommended), or

   • Options to install individually:

      • **Configuration App.**
      This is the Glide and Switch application and needs to be installed only on the PC that will be used to set up the ServSwitch Freedom switch via the supplied flash upgrade cable and OPTIONS port.

      • **Visual C++ Runtime**
      The C++ runtime library is a windows component that is required by the multi-monitor driver in order to run its helper applications. It is pre-installed with Windows but is offered here as an option as you may want to keep an older version already installed on your system, or you may already have a newer version in your copy of Windows.

      • **Drivers**.
      Multi-Monitor Glide and Switch drivers that are required on each PC that will be using Multi-Monitor.

   Choose the required components and click the **Next >** button.

3. Once the chosen components have been installed, click the **Finish** button.

   Note: On the PC that will be used to set up the ServSwitch Freedom switch, you can optionally tick 'Click to run the Glide and Switch Configuration Application' in the lower left corner to immediately begin using Glide and Switch - see 4.5 Configuring multiple monitors opposite for details.

   *Note: On each PC that you installed the driver, a process called **mumoapp.exe** will remain running.*

4.4.2 Configuring multiple monitors

Multi-Monitor configuration is similar to normal Glide and Switch setup except that you can add more than one display per PC, up to a total of eight per machine.

Note: It is necessary to install a driver on each PC that has multiple displays - see 4.4.1 Installing drivers and multi-monitor config app opposite.

1. Use the supplied flash upgrade cable to link the computer serial port to the ServSwitch Freedom **OPTIONS** port. If the optional ServSwitch Freedom LED Monitor module is connected to the **OPTIONS** port, then instead connect the upgrade cable between the computer serial port and the **TO KEYPAD OR PC** port of the ServSwitch Freedom LED Monitor module (see 3.3.5 Optional LED indicator connections for details).

2. If it is not already running, start the Glide and Switch configuration application.

3. On the icon bar, click the red, green, blue and yellow screen icons (or use the **Screens** menu) to add the required number of display screens per computer to the map area.

   For example, to add two monitors for PC 1, click the red computer icon twice. The two red monitor representations will be placed side by side within the Glide and Switch map area. See Figure 4-4.
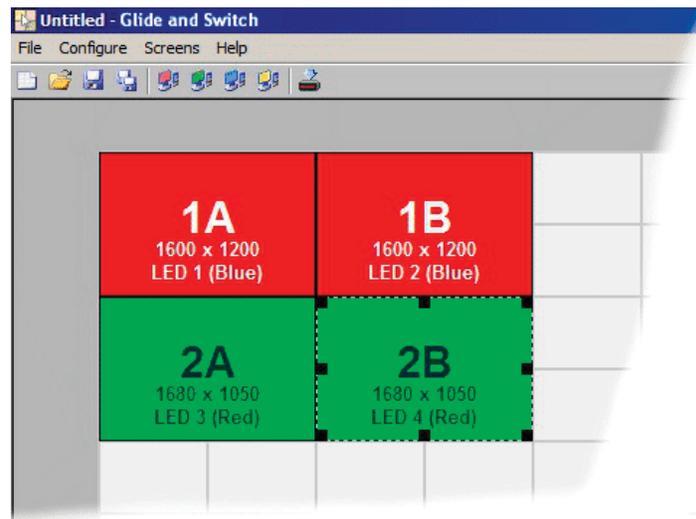

Figure 4-4. Adding new screens

4. Arrange the colored rectangular screen representations to mimic the physical layout of the actual displays. For example, you may wish to have the two screens of PC1 side by side, with the two screen screens of PC2 below them (as shown left), or some other arrangement to reflect the actual positions of the physical monitor screens.

   The important thing is to define where each screen edge abuts to the next so that the ServSwitch Freedom switch can determine the correct moments to switch channels.

   Use the small black squares around the perimeter of each highlighted screen representation to change their size or stretch them.

   Note: The numbers of the screen representations relate directly to the four channels on the ServSwitch Freedom switch, while the letters relate to the screen hierarchy attached to any single computer (i.e. A is primary, B is secondary, etc.).

5. Continue from **step 3** of the standard Glide and Switch configuration instructions.

4.5 Configuring LED indicators

When the optional ServSwitch Freedom LED Monitor indicator kit is used, there are several configuration options available that allow you to customise behavior and these are set using the Glide and Switch configuration application.

4.5.1 Adjusting color and brightness for all indicators

If necessary, you can impose default color and brightness settings upon all connected LED monitor indicators. Choose the **Configure** > **LEDs...** menu item to display the following popup. See Figure 4-5.
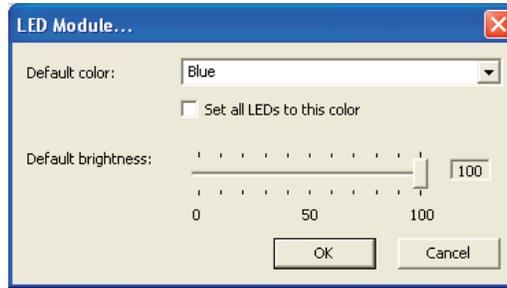

Figure 4-5. Configuring LED default color and brightness for all indicators

To impose a default color on all connected indicators, choose the required **Default color** and then tick the option **Set all LEDs to this color**.

Use the **Default brightness** option to determine the intensity of all indicators.

Click **OK** to exit and apply the required settings.

Note: Once default settings have been made you can optionally change any or all indicators individually as required using the steps outlined below.

4.5.2 Adjusting individual indicators

For each installed video display screen, you have the opportunity to add and configure an LED monitor indicator.

4.5.2.1 To adjust details for an individual indicator

1. Double-click on a screen representation (or right click on a screen representation and then choose **Properties**) to display the screen popup.

2. Click the **LED Set-up** tab to display the indicator details. See Figure 4-6.
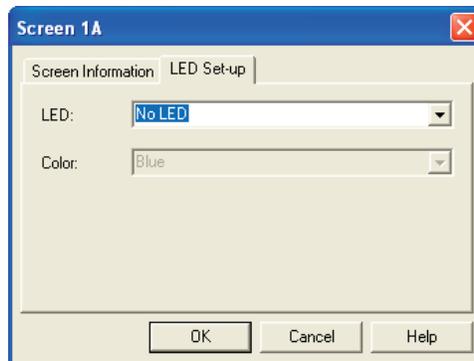

Figure 4-6. The LED Setup dialog

3. For a newly added screen the **LED:** entry will show *No LED*. Click on the drop down handle and choose the LED indicator that you wish to associate with the currently selected video display screen. See Figure 4-7.
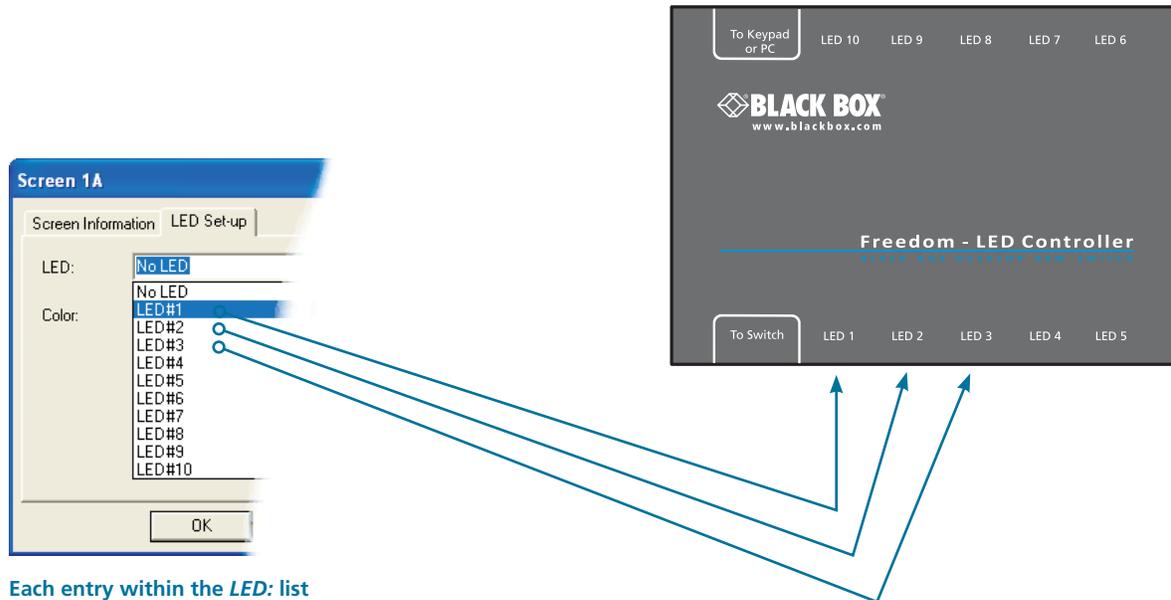

Each entry within the *LED:* list relates to one of the ten output sockets on the ServSwitch Freedom LED Monitor module.

Note: It is possible to associate any LED indicator with more than one video screen.

Figure 4-7. Choosing an individual indicator port

4. Choose the ServSwitch Freedom LED Monitor output port that you wish to associate with the currently selected video screen.

5. Optionally alter the color, from the **Color:** list, that you wish the LED indicator to display when the associated video screen is selected. See Figure 4-8.
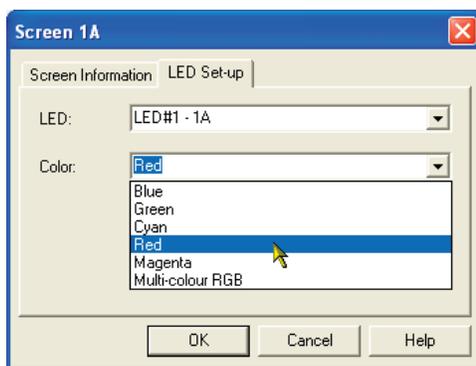
Note: Each LED indicator can only have one color, so if you associate an indicator with more than one screen and then change the color on a later screen assignment, it will be changed for all the screens in the list for that LED indicator.

Figure 4-8. Choosing a color for the chosen indicator port

6. Click OK to save and exit.

7. Repeat steps 1 to 6 for each screen that requires an LED monitor indicator.

8. Choose **Configure** > **Send Layout to Switch** to update the ServSwitch Freedom switch.

9. IMPORTANT: Once the Glide and Switch configuration application has downloaded the setup, remove and recon-nect power to the ServSwitch Freedom to allow the new settings to take effect.

4.6 Optional Glide and Switch operations and settings

4.6.1 Downloading the existing layout from the ServSwitch Freedom

If the ServSwitch Freedom unit has already been configured and you wish to alter it (and you don't have a saved .ffc config file), use the **Configure** > **Receive Layout from Switch** option to retrieve the current configuration from the ServSwitch Freedom.

4.6.2 Mouse... setting
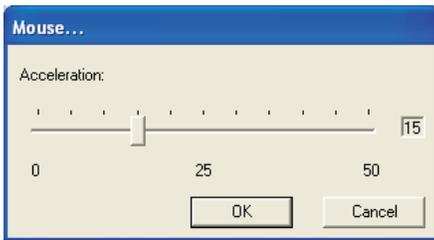
Mouse acceleration
Mouse acceleration allows you to move the mouse pointer quickly across the large areas of the screen in response to small but sharp shifts in the mouse position. The **Configure** > **Mouse...** option provides settings between 0 and 50, however, a value of 12 to 15 will give a typical Windows-like default operation.

4.6.3 Mouse parking... setting
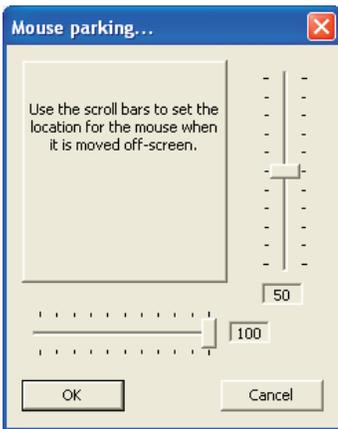
Mouse parking allows you to optionally determine where the mouse pointer for each system should be placed when the focus moves to a different system/video screen. The **Configure** > **Mouse parking...** option displays vertical and horizontal scroll bars. Use the scroll bars to pinpoint the position that should be used to park the dormant mouse on each screen.

4.6.4 Switch... settings
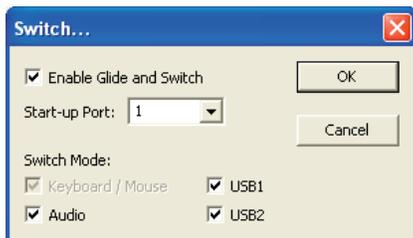
Enable (Disable) Glide and Switch
This option allows you to switch off the Glide and Switch feature within the ServSwitch Freedom unit. Located within **Configure** > **Switch...** menu item, untick the **Enable Glide and Switch** checkbox and download the configuration the ServSwitch Freedom unit to disable.

Start-up Port
Located within **Configure** > **Switch...** menu item, this option allows you to determine which port should be enabled whenever the ServSwitch Freedom unit is first powered on.

Switch Mode
Located within **Configure** > **Switch...** menu item, these check boxes allow you to determine which peripherals should be switched whenever the channel is changed by the Glide and Switch method. The switching of peripherals via the other methods of channels selection (e.g. the front panel, hotkeys, mouse buttons, etc.) remain unaffected by these settings. By default, the Keyboard/Mouse and Audio are selected.

4.7 Performing upgrades   (Windows only)

The ServSwitch Freedom 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

- Upgrade cable (supplied Flash Upgrade Adapter plus a CAT5 patch lead [see Appendix C for overall pin-out specifications]).

- A Windows-based upgrade computer with an RS-232 serial port.

- The latest version of the KVM Firmware Uploader and firmware files for the ServSwitch Freedom unit (available for download from the Black Box website. Go to the KV0004A product page and click on the 'Resources' tab).

4.7.1 Using the KVM Firmware Uploader utility

1. Download the latest ServSwitch Freedom unit KVM Firmware Uploader from Black Box Technical Support or from the Black Box website and install it on a Windows based upgrade computer that will be connected to the ServSwitch Freedom 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. Use the supplied Flash Upgrade Adapter and any CAT5 patch cable to link the serial port of the upgrade computer to the ServSwitch Freedom OPTIONS port. 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:
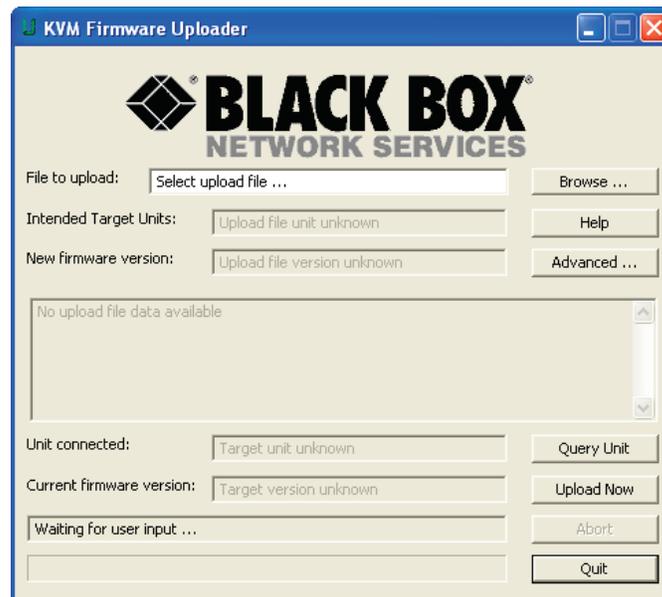
Figure 4-9. KVM Firmware Uploader utility screen.

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

   If the application cannot contact the ServSwitch Freedom 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:

FREEDM_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 4-10.
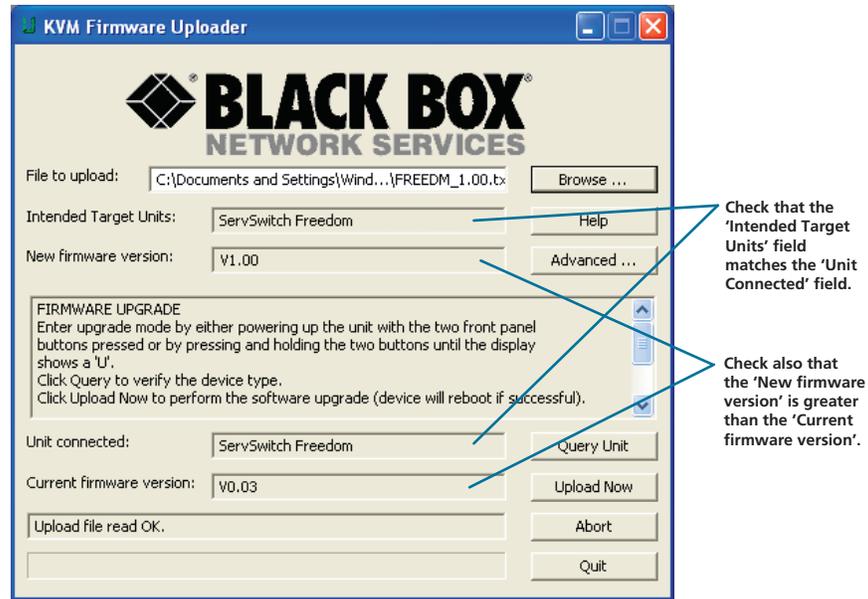

Figure 4-10. KVM Firmware Uploader utility screen with upgrade file selected.

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 Freedom unit will operate using the new firmware.

4.7.2 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 Freedom unit or computing equipment.

5. Operation

5.1 Selecting a computer

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

- Using the innovative Glide and Switch automatic switching utility

- Using the front panel controls

- Using hotkeys

- Using mouse button presses

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

5.1.1 Selecting a computer using the Glide and Switch utility

Once configured, Glide and Switch allows you to change channels merely by moving the mouse to edge of one screen towards the next screen. As the mouse pointer reaches the edge it will cause the channel to automatically change and will jump to the next screen.

Notes:

Glide and Switch cannot be enabled until a layout has been configured and downloaded to the ServSwitch Freedom unit - see 4.3 Glide and Switch configuration.

The mouse will not flow across the screens while any mouse buttons are pressed down - this prevents undesired behavior when dragging windows around or group-selecting items.

You can determine which peripherals will be switched by Glide and Switch independently of those that would be switched with any other method. See Switch Mode within the 4.3.3 Optional Glide and Switch operations and settings section.

You can continue to use any of the other channel switching methods while Glide and Switch is enabled.

The four upper indicators on the ServSwitch Freedom display panel will scroll across every few seconds to show that Glide and Switch is enabled. See Appendix B. What is Glide and Switch? for an introduction to the utility or 4.3 Glide and Switch configuration for more details about how to prepare it for operation.

5.1.1.1 Temporarily disabling and enabling Glide and Switch

You can temporarily disable (and re-enable) Glide and Switch using hotkey presses:

- Simultaneously press and hold CTRL and ALT, then press F

5.1.2 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.

Indicates the number of the currently selected computer

The upper four indicators will intermittently scroll across whenever Glide and Switch is enabled

Use this button to choose the next required computer

Use this button to choose which peripherals will be switched

COMPUTER   K/M   SPK   USB1 USB2   MODE

The K/M, SPK, USB1, and USB2 indicators 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.

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:

K/M   SPK   USB1   USB2

MODE   ● ● ● ●   Will switch all peripherals together

MODE   ● ● ○ ○   Will switch keyboard, mouse and speakers

MODE   ● ○ ○ ○   Will switch only the keyboard and mouse

MODE   ○ ● ○ ○   Will switch only the speakers

MODE   ○ ○ ● ○   Will switch only USB peripheral 1

        ○ ○ ○ ●   Will switch only USB peripheral 2

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.

The peripherals to be switched using the Glide and Switch method are set independently

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

5.1.3 Selecting a computer using hotkeys

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

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

5.1.3.1 Using 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 (K/M, 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

   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.*

5.1.3.2 Using 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 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.

5.1.4 Selecting a computer using the mouse buttons

Using the mouse buttons, you can quickly switch the keyboard, mouse, 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 (K/M, 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.

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.
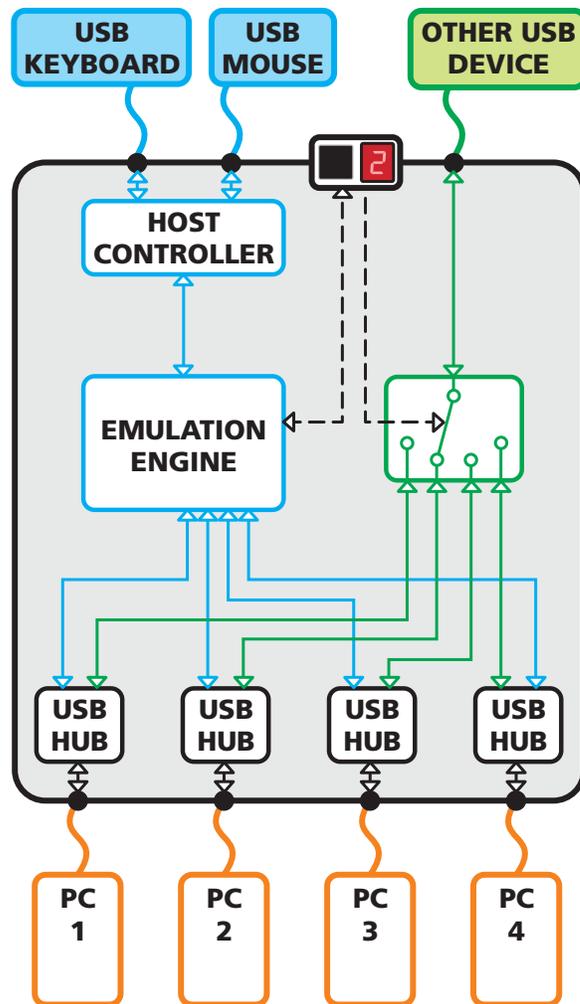

Figure A-1. True Emulation functional block diagram. The emulated section of the switch is shown in blue and handles only the keyboard and mouse. The green enumerated section of the switch handles other USB devices and also uses the USB hubs to link with the computers.

Appendix B. What is Glide and Switch?

Glide and Switch represents true innovation in KVM switching. For the first time, Glide and Switch allows users to automatically switch between target computers simply by moving the mouse pointer from screen to screen. What makes this such a revolution is that you no longer need software to be installed on your mission critical computers in order to do this. Glide and Switch resides on the switch itself, sensing screen boundaries and instantaneously switching keyboard and mouse to the defined target computer. Glide and Switch can be configured for almost any combination of screens using the included configuration application which allows you to declare the individual screen sizes and visually position each one relative to the others.
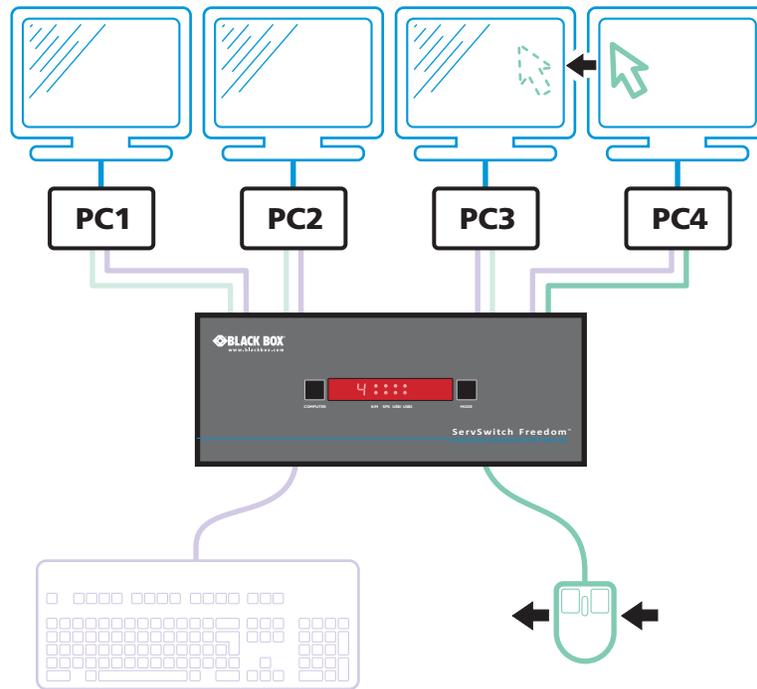
Figure B-1. Moving the mouse beyond a screen border causes Glide and Switch to switch the channel

Glide and Switch consists of special code within the ServSwitch Freedom unit plus an intuitive graphical configuration application. First you inform the Glide and Switch configuration application how many screens you have, their pixel resolutions and how they are physically arranged (e.g side-by-side, vertical stack, square formation, etc.). You then download this information to the ServSwitch Freedom unit and this is used during operation to determine the precise moment to switch from one screen/system to the next.

The beauty of Glide and Switch is its simplicity of configuration and operation. Once the initial configuration has taken place, all monitoring and switching is handled within the ServSwitch Freedom without need for extra connections or software utilities.

Issues when using Glide and Switch

• The ServSwitch Freedom unit must have a minimum of firmware version 2.00 installed to operate with Glide and Switch.

• Glide and Switch does not run any special utilities on each computer and thus has no way to instruct the computers to hide their mouse pointers when they are deselected by the ServSwitch Freedom unit. Therefore, the ServSwitch Freedom 'parks' each mouse pointer in the bottom right corner of the screen immediately before changing the channel. In most cases this will cause no issues, however, it may be noticeable in circumstances such as the following:

• If the task bar is set to auto hide and it is positioned either along the bottom of the screen (as default) or along the right hand side, then the task bar will automatically reappear when the mouse pointer is parked.

• When playing full screen video, the on-screen controls (play, pause, seek etc.) will very likely be revealed when the mouse pointer is parked.

• The mouse will not flow across the screens while any mouse buttons are pressed down - this prevents undesired behavior when dragging windows around or group-selecting items.

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 connectors.

### 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
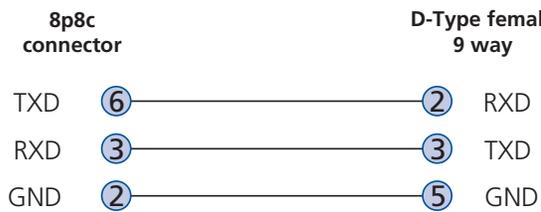
Serial remote control and flash upgrade cable (10p10c)

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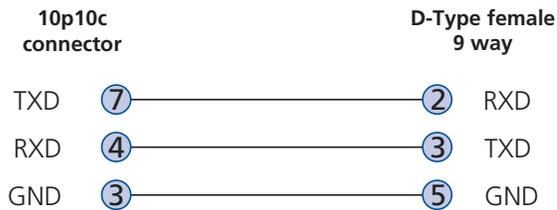
Appendix D. Safety information

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

- 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 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 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 unit yourself.

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