



ServSwitch™ EC Series Single-Head DVI USB, 16-Port

Manage and control up to 16 DVI
and USB servers from your desktop.



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Normas Oficiales Mexicanas (NOM) Electrical Safety Statement INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El 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 lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
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11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra 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 líneas de energía.

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 líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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1. Specifications

Automatic Scan Interval — 3, 8, 15, and 30 seconds

Cable Length (Maximum) — At console: 15 ft. (4.5 m);
At PC ports for USB server: 15 ft. (4.5 m)

Hotkey Control — Yes

Hot Plug and Play — Yes

On-Screen Display — Yes

Operating Systems Supported — Windows® 98/Me/7, Windows XP,
Windows NT, Windows 2000, Windows Vista®, and Mac®

Programmable Scan Pattern — Yes

Video Bandwidth — 1920 x 1200 (WUXGA)

User Controls — (8) front-panel push buttons

Connectors — Console side: Monitor: (1) DVI-I F (digital only);
Keyboard/mouse: (2) USB Type A F;
CPU side: Video input: (16) DVI-I F (digital only);
Keyboard/mouse: (16) USB Type B F

Indicators — (33) LEDs: (2) per port, (1) Power per unit

Temperature Tolerance — Operating: +41 to +104° F (+5 to +40° C);
Storage: -4 to +140° F (-20 to +60° C)

Relative Humidity — 0 to 80%

Power — Input: 100–240 VAC, 50–60 Hz, autosensing;
Output: 12 VDC, 4 amps (maximum)

Size — 2.6"H (2U) x 17.25"W x 9"D (6.6 x 43.8 x 22.9 cm)

Weight — 8.4 lb. (3.8 kg)

2. Overview

2.1 Introduction

The ServSwitch EC Series Single-Head DVI USB, 16-Port enables a single user to access and control up to 16 DVI computers from a high-definition console. It uses one DVI and/or one VGA monitor, a USB keyboard, and a USB mouse.

The switch's video enhancement technology ensures superb quality up to 1920 x 1200 resolution. The on-screen display (OSD) features computer naming, computer selection, status indication, autoscan, and much more. The EDID table ensures that the switched graphics card is always ready to work with your screen.

2.2 Features

Manage up to 16 servers with this simple plug-and-play KVM switch.

- Resolutions up to 1920 x 1200 (also 1920 x 1080).
- Perfect for small server rooms.
- 16-port DVI (single link) and USB KVM switch with USB/DVI console with optional VGA output.
- Unit is 2U high.
- Supports Microsoft® IntelliMouse® (Pro).
- Operating system independent and transparent to all applications.
- Switch with hotkeys, front-panel push buttons, or use autoscan, which selects servers sequentially.
- Hot-pluggable keyboard/mouse ports.
- Plug-and-play configuration.
- DDC2B compatible.

2.3 What's Included

- (1) ServSwitch EC Series Single-Head DVI USB
- (1) universal power supply, 12 VDC, 4.0 A output
- (1) 6-ft. power cable
- Set of (4) foot pads
- (2) mounting brackets
- Assortment of screws

- This user’s manual

2.4 System Requirements

2.4.1 Console Side

- DVI and/or VGA monitor
- (1) USB keyboard
- (1) USB mouse

2.4.2 Computer Side

- USB-enabled DVI computer(s)

2.4.3 Cables

Each computer must be connected to the unit by:

- (1) USB cable and (1) DVI cable

OR

- (1) ServSwitch cable with DVI and USB (EHN900024U)

2.5 Hardware Description

Figures 2-1 and 2-2 illustrate the front and back panels of the KV9516A. Table 2-1 describes its components.

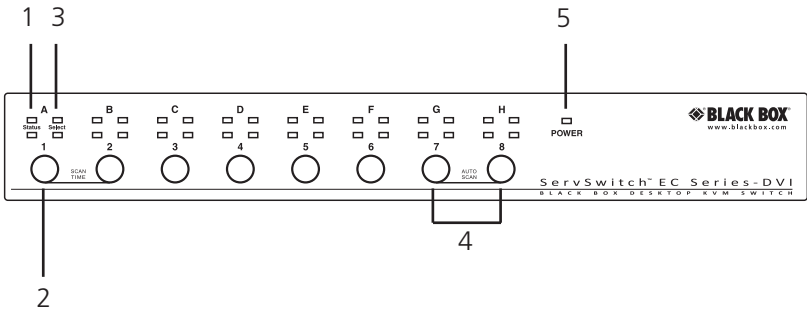


Figure 2-1. KV9516A front panel.

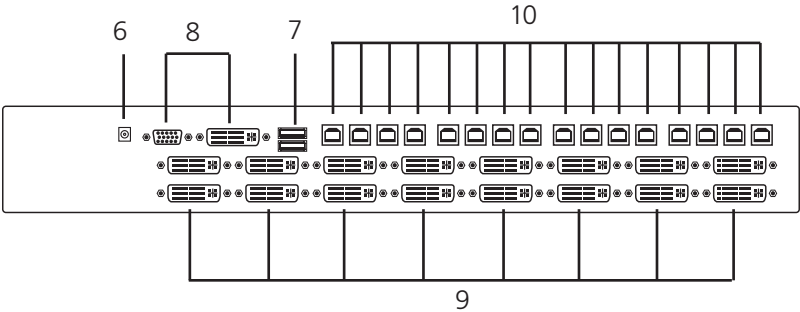


Figure 2-2. KV9516A back panel.

Table 2-1. KV9516A front and back panel components.

Number	Component	Description
1	CPU Status LEDs	LEDs light when the connected computer is powered on.
2	Port selection buttons	Press buttons 1–8 individually to select a computer.
3	CPU Select LEDs	LEDs light when the connected computer is selected.
4	AutoScan buttons	Press buttons 7 and 8 together to start AutoScan.
5	Power LED	Lights when power is on.
6	Barrel connector	Links to power adapter.
7	Console USB Type A ports	Keyboard and mouse ports for console.
8	Console video port	Attaches to the user monitor.
9	Computer DVI ports	Connect to a computer’s video cards.
10	Computer USB Type B ports	Keyboard/mouse ports for computers.

2.6 Configuration

Figure 2-3 shows a single KVM switch configuration.

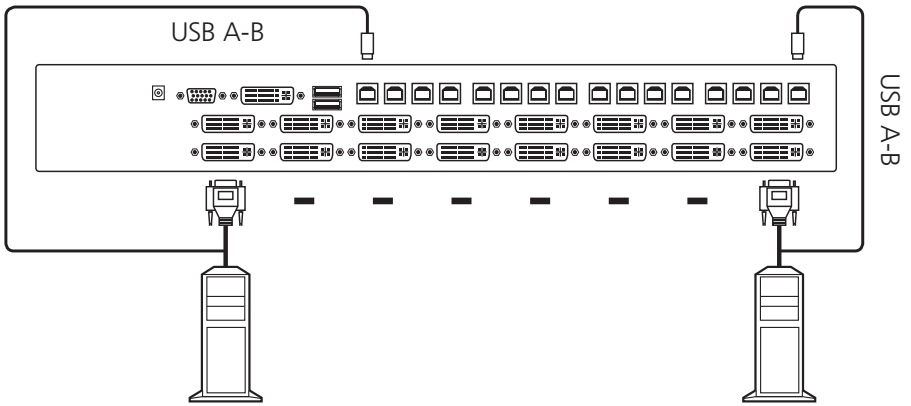


Figure 2-3. Single KVM switch configuraton.

Chapter 3: Installation

3. Installation

Before installation, power off all devices that will be connected to this system.

- Make sure that all devices you will connect are properly grounded.
- Place cables away from fluorescent lights, air conditioners, and machines that are likely to generate electrical noise.

3.1 PC BIOS Notice

The following BIOS setup changes are necessary for PC users and not necessary for Mac users:

- In standard CMOS, set "Halt on Error" to "All but keyboard."
- In PNP and PCI setup, set "PNP OS installed" to "YES" and set "USB IRQ" to "Enabled."

3.2 Device Connection

3.2.1 Console Connection

1. Plug the monitors into the console's video port; plug a USB keyboard and a USB mouse into the corresponding USB ports on the console.

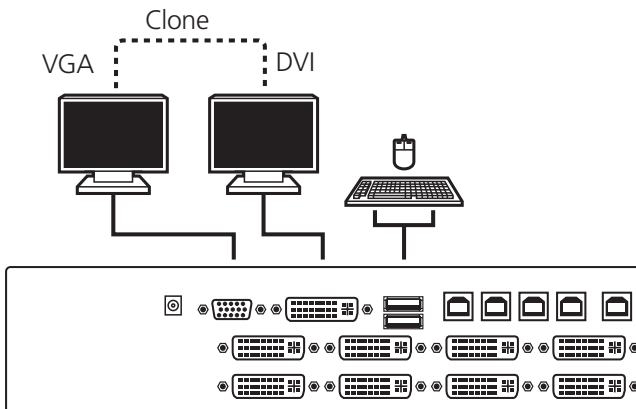


Figure 3-1. Connecting the console.

NOTE: The HD15 (VGA) port on the console side of the KVM switch provides an extra clone video signal of DVI.

3.2.2 Computer Connection

1. Use a male-to-male video cable(s) to connect both video ports on the computer and the unit's PC side.

NOTE: The connectors are physically DVI-I, but they only support digital video signals.

2. Use a USB A-B cable to connect the unit's USB port (B connector, square connector) and the USB port on the corresponding computer (A connector, flat connector).

*NOTE: Use KVM Cable with DVI and USB connectors for easy installation.
(The cable part number is EHN900024U.)*

3. Repeat Steps 1 through 2 for each PC port on the KVM switch.
4. Plug the external power adapter from an appropriate DC power source (included) to the switch's power port.

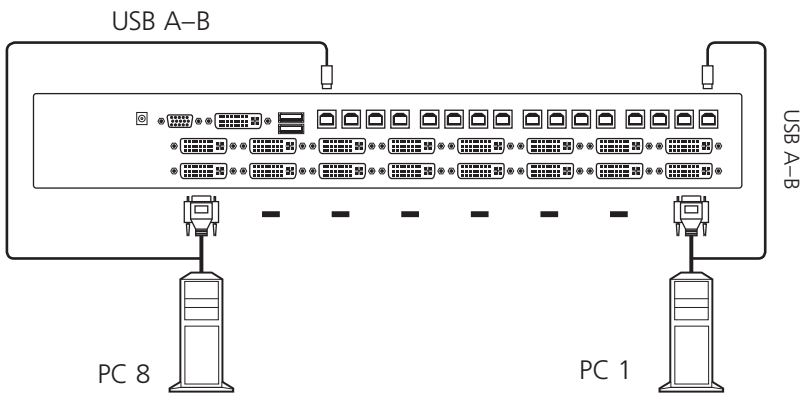


Figure 3-2. Connecting the computer.

4. Operation

Figure 4-1 shows the push buttons and LED indicators on the switch's front panel.

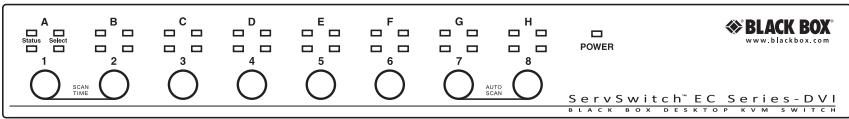


Figure 4-1. Front panel.

NOTE: You can select a computer by pressing the push button directly, by issuing hotkey commands, or by activating the OSD window.

4.1 Push Buttons

NOTE: Ports 1–8 represent the lower 8 ports and Ports A-H are the higher 8 ports. Ports 1 and A share the same push button, Ports 2 and B share the same push button, and so on. If Port 1 is already selected, tap its push button to select Port A. If Port 1 is not selected, press and hold push button 1 for two seconds to select Port A.

4.1.1 K/M Reset

K/M reset solves most problems developed by keyboard, mouse, device replacement, or change of configuration. Press down both the front-panel number 1 or 2 push buttons for two seconds to reconfigure the whole system without turning either the KVM switch or any computer off.

4.1.2 Autoscan

Press the 7 and 8 push buttons for two seconds to start autoscanning.

4.2 LED Indicators

The corresponding LED lights red to indicate that port is selected. If the corresponding LED flashes red, the port is either in autoscan or manual scan mode. The corresponding LED lights green when the port connects to a powered-on computer. There are two rows of LEDs: the lower row is for numerical Ports 1–8 and the upper row is for alphabetical ports A-H.

4.3 On-Screen Display (OSD)

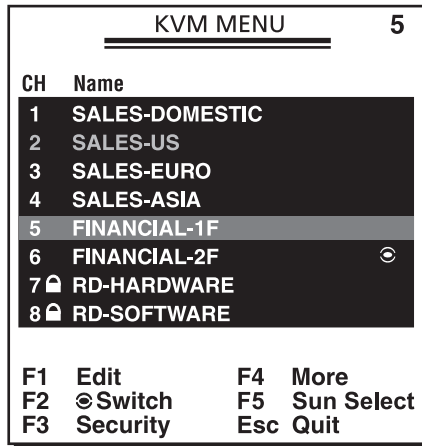
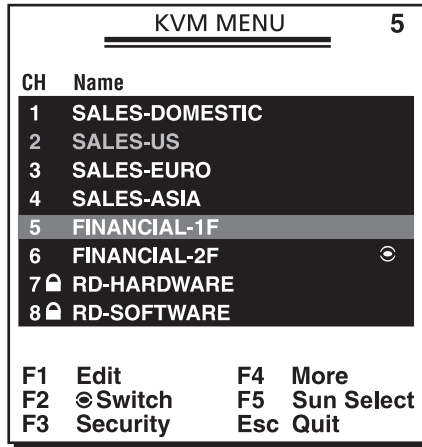


Figure 4-2. OSD screen.

To bring up the hotkey menu if it is enabled:

Press Left-Ctrl + Left-Ctrl within two seconds.

Chapter 4: Operation

OR

Press **Left-Ctrl + Left-Ctrl + Left-Ctrl** within two seconds to display a KVM Menu screen showing a list of the computers with corresponding port numbers, names, and statuses. See Figure 4-2 above.

The port number of the currently selected computer is displayed in red, same as the front indicator, at the upper-right corner of the OSD menu.

The color of a device name is green if it has power and is ready for operation. The device name is white if it has no power. OSD menu updates the color when it is activated. Press the **PageUp** and **PageDown** keys to view the other eight computers.

Using the up-arrow, down-arrow, number **1** to **8** keys, or **A** to **H** keys highlight computer, then press the **Enter** key to select it. Or, press the **Esc** key to exit OSD and remove the OSD menu from the display; the status window returns to the display and indicates the currently selected computer or operating status.

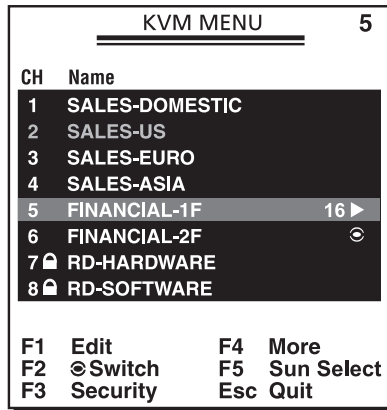


Figure 4-3.

An eye-mark on the right of a name indicates that computer is selected and monitored in Scan mode. In the OSD, you can switch this mark on or off by pressing function key **F2**.

Press the **Esc** key to exit OSD and return to the selected computer; the computer name is also shown on this screen.

Function key F1: Use this key to edit the name entry of a computer with up to 14 characters. First, highlight a port and then press **F1** and enter the computer name. Valid characters are A–Z, 0–9, and the dash (-) character. Lowercase letters are converted to uppercase ones. Press the **Backspace** key to delete a letter one at a time. Non-volatile memory stores all name entries until you change, even if the unit is powered off.

Function Key F2: Use this key to switch the eyemark of a computer on or off. First, use the up-arrow and down-arrow keys to highlight it, then press the **F2** key to switch the eyemark on or off. If Scan Type is **Ready PC + eyemark**, only the power-on and eyemark-selected computers will be displayed sequentially in Scan mode.

Function Key F3: Use this key to lock a computer from unauthorized access. To lock a device, highlight it and then press **F3**. Enter up to four characters (A–Z, 0–9, or the dash [-] character) for a new password, then press the **Enter** key. A security-enabled device is marked with a lock icon following its port number. To permanently disable the security function from a locked device, highlight it, press **F3**, then enter the password.

To access the locked device temporarily, simply highlight it and press the **Enter** key. The OSD will ask you for the password. After you enter the correct password, you can use the device. The device automatically re-locks when you switch to another port. During Scan mode, the OSD skips the password-protected devices.

NOTE: If you forget the password, the only way to permanently erase all the passwords is to press and hold the front-panel buttons 1 and 2, then press and hold buttons 7 and 8. Release 7 and 8, then release 1 and 2.

Function Key F4: Press **F4** for more functions. A new screen pops up displaying more functions as described below. Most of them are marked with a triangle indicating that there are options to choose from. Use the up-arrow and down-arrow keys to select the functions, then press the **Enter** key. Press **Esc** at any time to exit.

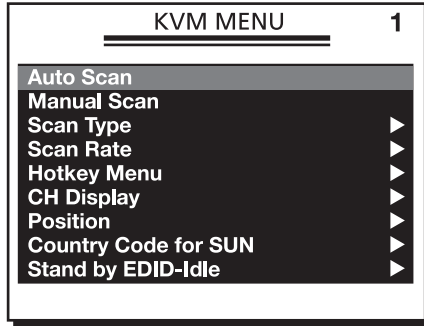


Figure 4-4. KVM menu.

Auto Scan: In this mode, the KVM switch automatically switches from one powered-on computer to the next sequentially in a fixed interval. During Auto Scan mode, the OSD displays the name of the selected computer. When Auto Scan detects any keyboard or mouse activity, it suspends the scanning until activity stops. Then, it resumes scanning with the next computer in sequence. To abort the Auto Scan mode, press the **Left-Ctrl** button twice, or press any front-panel button. Scan type and scan rate set the scan pattern. Scan Type (**F4**: More\Scan Type) determines if scanned computers must also be eye-mark selected. Scan Rate (**F4**: More\Scan Rate) sets the display interval when a computer is selected before selecting the next one.

Manual Scan enables users to manually switch back and forth between active computers via keyboard control. Type **F4**: (More\Scan type) to determine if scanned computers must also be eye-mark selected. Press the up-arrow key to select the previous computer and press the down-arrow key to select the next computer. Press any other key to abort the Manual Scan mode.

Scan Type:

Ready PC + Eyemark: In Scan mode, scan through powered-on and eyemark-selected computers.

Ready PC: In Scan mode, scan through powered-on computers.

Eyemark Only: In Scan mode, scan through any eyemark-selected computer regardless of computer power status. The non-volatile memory stores the Scan Type setting.

Scan Rate: Sets the duration of a computer displayed in Auto Scan mode. The options are 3 seconds, 8 seconds, 15 seconds, and 30 seconds. The non-volatile memory stores the Scan Rate setting.

Hotkey Menu: When you press the **Left-Ctrl** key twice within two seconds, the hotkey menu appears displaying a list of hotkey commands if the option is on. You can turn off the hotkey menu if you prefer not to see it when the **Left-Ctrl** key is pressed twice. The non-volatile memory stores the hotkey menu setting.

CH Display:

Auto Off: After you select a computer, the port number and name of the computer will appear on the screen for three seconds then disappear automatically.

Always On: The port number and name of a selected computer and/or OSD status displayed on the screen all the time. The non-volatile memory stores the CH Display setting.

Position: The position of the selected computer and/or OSD status displays on-screen during the operation. The actual display position shifts with different video resolution, the higher resolution, the higher display position. The non-volatile memory stores the Position setting.

Upper Left, Upper Right,
Lower Left, Lower Right,
Middle.

Country Code for Sun: Sun® keyboards of different languages have different layouts. The KVM switch is able to emulate a Sun keyboard for a specific language type or country such as Arabic, Belgian, US, Yugoslavia, and so forth. Select the proper country code that matches ALL your Sun computers.

NOTE: The country code must be set before powering on the Sun computer. Otherwise, the system may not function well.

Stand by EDID-Idle: In some cases, display problems may happen because of incorrect EDID communication between the display monitor and the PC graphics card or inappropriate EDID data programmed by display manufacturers. This function enables the KVM switch to read the necessary EDID information from the attached video display and then provide it at all times to the attached computer.

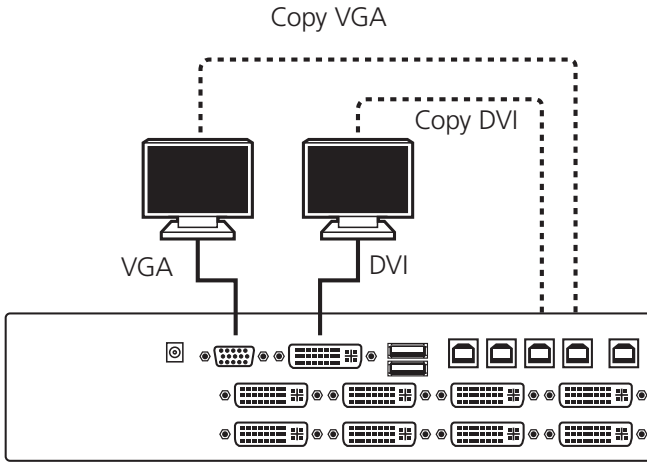


Figure 4-5. Copy VGA and DVI.

If no new EDID information is available from a display, a default profile in the KVM switch is automatically provided instead.

The system can get EDID details from the monitor by using the following methods:

- **Copy DVI:** Under the DVI monitor connection, users can copy the DVI monitor's EDID data as the system video display setting.
- **Copy VGA:** Under the VGA monitor connection, users can copy the VGA monitor's EDID data as the system video display setting.
- **Sequence Hunting:** The system will automatically search any available EDID data from the connected display or embedded EEPROM (Read-Only memory)
- **Default:** The display configuration will follow the factory default setting.

NOTE: When users plug both the DVI and VGA monitor into the video ports on the switch, the DVI EDID data has the priority over the VGA EDID data.

NOTE: The system will automatically Copy the DVI EDID data as the system video display setting when it detects the DVI monitor connection.

Function key F5: Press this key to switch the Sun mark of a port on or off indicating the computer is a Sun server. When a Sun marked port is selected, the KVM switch starts to translate the keys from a PC keyboard to a Sun keyboard.

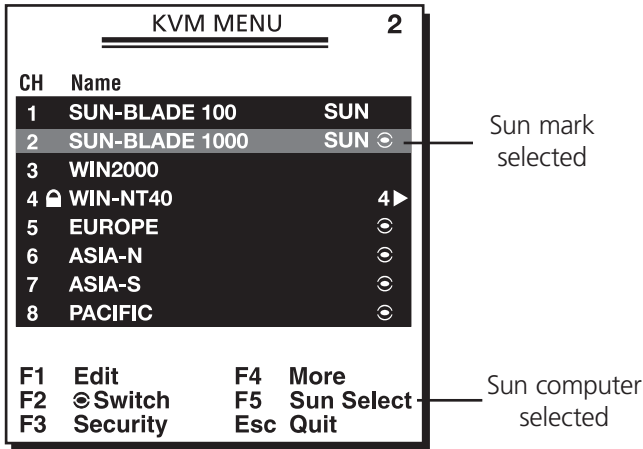


Figure 4-6.

With different types of keyboards and computers, the Sun mark must be set up to comply with the instructions listed in Table 4-1.

Table 4-1. Sun mark compliance.

Keyboard Type	Computer Type	Sun Mark
USB (non Sun)	PC/Mac	None
USB (non Sun)	Sun	Yes
USB Sun	PC/Mac	None
USB Sun	Sun	None

Esc: To exit the OSD, press the **Esc** key.

4.4 Hotkey Commands

A hotkey command is a short keyboard sequence for selecting a computer, activating computer scan, etc. A hotkey sequence starts with two **Left-Ctrl** keystrokes (successively in 0.2 seconds) followed by one or two more keystrokes. A built-in buzzer generates a high-pitch beep for correct hotkey command; otherwise, one low-pitch beep generated for error and the bad key sequence will not be forwarded to the selected computer.

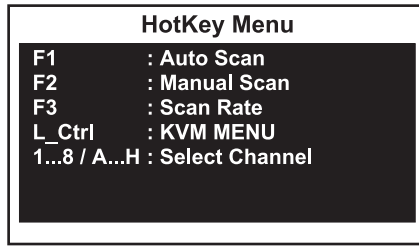


Figure 4-7. Hotkey menu.

The short form hotkey menu can be turned on as an OSD function (F4: More\ Hotkey Menu) every time the **Left-Ctrl** key is pressed twice.

Left-Ctrl is the Ctrl key located at the left side of the keyboard. See Figure 4-8.

1-8/A-H are the number keys 1-8 at the upper row of the keyboard and character keys A-H case-insensitive.

NOTE: Do not use the keypad at the right of the keyboard.

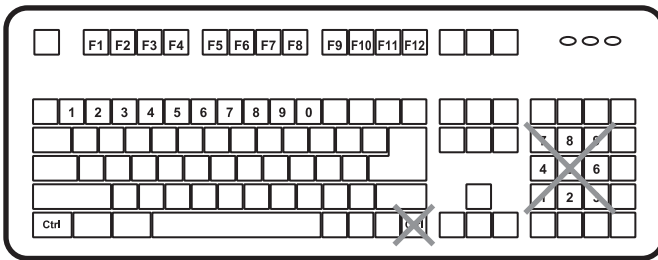


Figure 4-8. Keyboard.

To select a computer by hotkey command, you must know its port number, which is determined by the KVM switch connection.

Press **Left-Ctrl** + Press **Left-Ctrl** + Press 7

Selects the computer connected to Port 7 of the switch.

To start Auto Scan, automatically scan powered-on computers one by one at a fixed interval:

Press **Left-Ctrl** + Press **Left-Ctrl** + Press F1

When Auto Scan detects any keyboard or mouse activity, it suspends the scanning until activity stops; it then resumes with the next computer in sequence. The length of the Auto Scan interval (Scan Rate) is adjustable. To abort the Auto Scan mode, press the **Left-Ctrl** key twice.

NOTE: Scan Type determines whether an eyemarked computer will be displayed during Auto Scan.

Manual Scan enables you to manually switch back and forth between the powered-on computers.

Press **Left-Ctrl** + Press **Left-Ctrl** + Press **F2**

Press the up-arrow or down-arrow keys to select the previous or the next computer in sequence. Press any other key to abort the Manual Scan.

To adjust Scan Rate that sets the duration before switching to the next computer in Auto Scan:

Press **Left-Ctrl** + Press **Left-Ctrl** + Press **F3**

The KVM switch beeps one to four times indicating the scan interval of 3, 8, 15 and 30 seconds respectively.

Operating Sound: There are two options for setting the operation sound. To turn ON/OFF the operation sound:

Press **Left-Ctrl** + Press **Left-Ctrl** + Press and hold **Alt** + Press **B**

Appendix. Troubleshooting

Make sure that all cables are well-seated. Check that the keyboard/mouse cables are not swapped. Label and bundle the cables for each computer to avoid confusion when connected to the KVM switch.

A.1 Problems/Causes/Solutions

Symptom: Mouse does not work.

Causes:

- Too many mouse drivers are on in the computer.
- In Auto Scan, keyboard and mouse are not operable.

Solutions:

- Make sure that there is only one mouse driver installed on each computer.
- Remove all unnecessary keyboards and mouse drivers.
- Press any front-panel button to select a computer, then use the keyboard and mouse.

Symptom: Monitor works fine but keyboard and mouse do not work.

Causes:

- Check the keyboard and mouse connection; be sure that the cables are not swapped.
- Incorrect cables.

Solution:

- Connect the cables according to the keyboard and mouse marks on the connectors.

Symptom: Video image is not clear.

Cause: Poor quality video cables.

Solution: Use UL® 2919 rated, double-shielded video cables.

Symptom: No screen image or no OSD menu.

Cause: A powered-on computer is not selected.

Solution: Power on a computer and select it using the front-panel push buttons.

Symptom: Unable to operate USB Sun server.

Cause: Sun mark is not selected in OSD menu.

Solution: Invoke the OSD menu, move the light bar to the port, and press **F5** to set the Sun mark on.

Symptom: Letters on the TFT LCD display are blue or have shadows.

Cause: Improper resolution settings.

Solution: Under Control Panel, set the computers' video output to match the highest resolution of the LCD monitor with "Large Font" for the best performance.

Symptom: Autoscan does not switch PCs, and the KVM switch beeps intermittently while a red indicator flashes.

Causes:

- All PCs are off or only one PC is powered on. Scan mode works for powered-on computers only.
- Scan type is eyemark selected, but no powered-up PC is eyemark selected in OSD.

Solutions:

- Power on computers.
- Set the proper Scan type in OSD and determine which PCs are eyemark selected.
- Press the **Left-Ctrl** key twice to abort autoscan mode.

Appendix: Troubleshooting

- Press any front-panel button to select a PC, and autoscan stops.

Symptom: The up-arrow and down-arrow keys do not work in manual scan.

Causes:

- All PCs are off or only one PC is powered on. Scan mode works for powered-on computers only.
- Scan type is eyemark selected, but no PC is eyemark selected in OSD.

Solutions:

- Power on computers.
- Press any other key to abort manual scan mode.
- Set the proper scan type in OSD and determine which PCs are eyemark selected.

Symptom: The OSD menu is not in the proper position.

Cause: The OSD menu has fixed resolution and its size varies as computer video resolution changes.

Solution: Use **F4: More\Position** to select upper-left (UL) or upper-right (UR). The OSD menu may appear near the middle of the screen when lower-left (LL) or lower-right (LR) is selected.

Symptom: The keyboard or mouse cannot function normally.

Cause: The connection of keyboard/mouse may be reversed.

Solution: Make the connection pattern right. Change the connection status for keyboard/mouse.

Symptom: Keyboard strokes are shifted.

Cause: The computer was in shifted state when last switched.

Solution: Press both **SHIFT** keys.

Symptom: In Sun mode, the server shuts down and cannot work normally.

Causes:

- Country code setting is wrong.
- The old version of Sun does not support “low power” mode.

Solutions:

- Set the right country code before powering on the Sun.
- Except for Solaris® 9 and other advanced versions, the KVM switch does not support low power option under power off selection.

Symptom: The Sun keyboard cannot be operated normally.

Cause: In F5 function, Sun marked port might be switched to the “On” mode.

Solution: Check if the Sun marked port is switched to “On” status. If yes, switch it to “Off” mode.

Symptoms: Computer hangs up while switching computer.

Cause: Device initialization takes too much time.

Solutions:

- Wait at least five seconds before computer switching to ensure proper USB communication.
- Turn off the device driver (not keyboard or mouse) before computer switching.

Appendix: Troubleshooting

Symptom: No video signal when users plug and unplug the DVI connector or switch from port to port.

Cause: Some DVI video cards do not respond to the signal switch simultaneously.

Solutions:

- Make sure that you plugged a monitor to the console's DVI port before plugging or unplugging the PC's video connector(s).
- Wait for a few seconds.

A.2 Contacting Black Box

If you determine that your ServSwitch EC Series Dual-Head DVI USB, 8-Port is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

A.3 Shipping and Packaging

If you need to transport or ship your ServSwitch EC Series Dual-Head DVI USB, 8-Port:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

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