



Manual

KVT127 Switch

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KVM Switch Modules

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Please read this manual thoroughly and follow the **Installation** procedures to prevent any damage to the switch or connecting device.

Introduction

Overview

The combination of the console and KVM Switch Module offers the latest and the most efficient way of controlling server rooms and multiple computers. Many models of KVM Switch Modules are available to control from 8 to 136 servers by the console or another set of console 100ft (30m) away; it is the ultimate tool for server management.

There are many models of KVM Switches modules with different computer interfaces available:

- **Standard models** with three connectors for PS/2 keyboard, PS/2 mouse and monitor (HDB15), as shown in Figure 1.
- **Hybrid "PS/2 + USB" models** with PS/2 keyboard, PS/2 mouse, USB (keyboard + mouse) and monitor (HDB15), as shown in Figure 2.
- **Slim PS/2 models** with special 3-in-1 connectors for PS/2 keyboard, mouse and monitor (HDB15), as shown in Figure 3.



Figure 1: Standard connectors for PS/2 connection



Figure 2: PS/2 and USB connectors

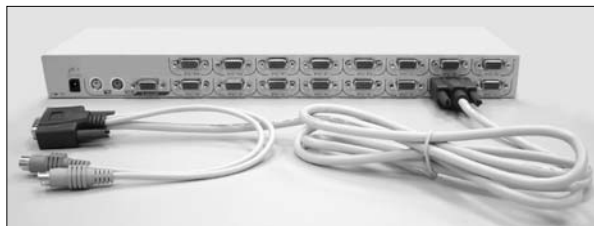
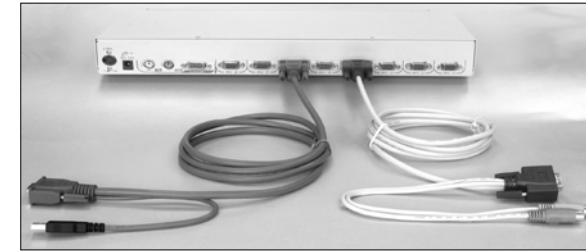


Figure 3: Slim PS/2 3-in-1 connectors and cables



Slim USB+PS/2, 3-in-1 connectors and cables

On-Screen Display (OSD) Menu

With a BLACK BOX KVM Switch module, you can name your computers, switch to a computer from a list, configure settings with easy-to-use menus, view the name of the selected computer on-screen with programmable time interval. The OSD menu displays the system status throughout operation.

High Video Quality

BLACK BOX's LCD panel supports VGA resolution up to 1280x1024 without any degradation. The advanced VGA circuit design guarantees smooth and flicker-free switching from one computer to the other with cable length up to 100ft (30M)* at PC sides with BLACK BOX KVM Switch.

*Tested with high-quality UL2919-rated, low-loss and shielded cables.

Features for all models

- Cascade configuration expands system capability
- Auto-scan automatically selects computers sequentially
- Supports Microsoft IntelliMouse (Pro)
- Assign computers with unique and meaningful names
- Identify and select computers by the names
- Programmable scan filters unused computers
- Store system settings and name entries to non-volatile memory

- Password security locks computer from unauthorized access
- Gain complete control with easy-to-use OSD interface
- Hotkey functions allow easy computer access
- Keyboard states automatically saved and restored when switching computers
- Operating system independent, transparent to all applications
- Plug and play system configuration
- Keyboard and mouse can be hot plugged at any time
- DDC2B compatible
- Supports optional multimedia module for microphones and stereo speakers
- Cascadable to all 19" rack mountable PS/2 KVM Switches

Features for Standard 1-Console Models

- Supports both PS/2 and serial mouse
- Uses standard connectors for computer connection

Features for Standard Models with multi-access

- Manage multiple computers from two locations
- Different Console may have different type of mouse i.e. generic PS/2 mouse and scroll mouse
- Selectable User Timeout
- Same as the Standard 1-Console models

Features for Hybrid "PS/2 + USB" KVM Switch Models

- Supports computers with either PS/2 or USB interface
- Supports Sun servers, HP servers and Mac

Features for Slim PS/2 KVM BLACK BOX KVM Switch Models

- Special 3-in-1 cables save spaces and offer the most flexibility
- 16-port model is only 1U in height

Features for Slim "USB + PS/2" KVM Switch Models

- Unique loose-free, 3-in-1 cables save spaces, ideal for computers

with PS/2 or USB interfaces, such as PS, USB-Sun and USB-Mac.

Configurations

BLACK BOX KVM Switch Modules are available for 4, 8, and 16 ports with various interfaces. For the applications of requiring many computers, BLACK BOX KVM Switch Modules can be cascaded in a master/slave configuration.

Single BLACK BOX KVM Switch Module Configuration

Combined with an BLACK BOX Console, the BLACK BOX KVM Switch Module can be connected to multiple computers with keyboard, mouse, and monitor cables as shown in Figure 4.

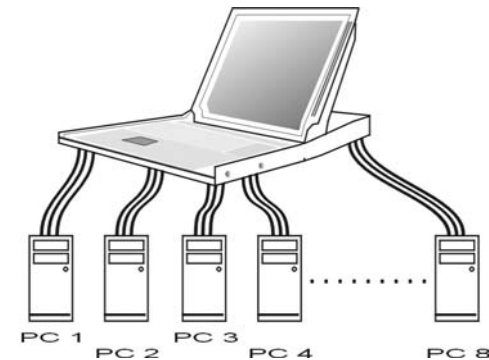


Figure 4: A single BLACK BOX KVM Switch Module configuration

BLACK BOX KVM Switch Module in cascade (Master/Slave) Configuration

You can connect a second level of one or more BLACK BOX KVM Switch Modules to a *Master* unit. Cascade configuration expands system ability, allowing you to select computers connected to the *Master* or *Slaves*. There is only one *Master* that connects to the BLACK BOX Console directly operated by a user. Once connected, BLACK BOX KVM Switch Modules automatically configure themselves to either *Master* or *Slave*. *Slaves* of different BLACK BOX KVM Switch Modules can be mixed in cascade configuration as shown in Figure 5.

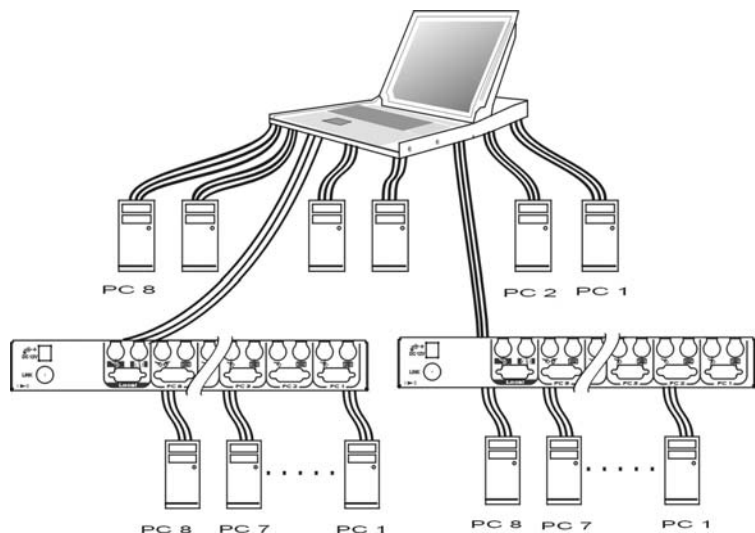


Figure 5: A cascade BLACK BOX configuration

Throughout this manual, *Master* is an BLACK BOX KVM Switch Module that connects directly to the drawer. And, *Slave* is an BLACK BOX KVM Switch Module that has its **CONSOLE** port connected to a *Master's* "PC x" port. *Slave* only exists in cascade configuration.

Installation

Device Connection

Standard Models (IKM001, IKM108D, IKM116D, IKM2108D, IKM2116D)

Determine the port number of each computer. For computers using PS/2 mouse, connect the computer's mouse and keyboard cables to the BLACK BOX's connectors marked with a mouse and keyboard respectively, as shown in Figure 6. Repeat this step for **PC 1** to **PC 8**.

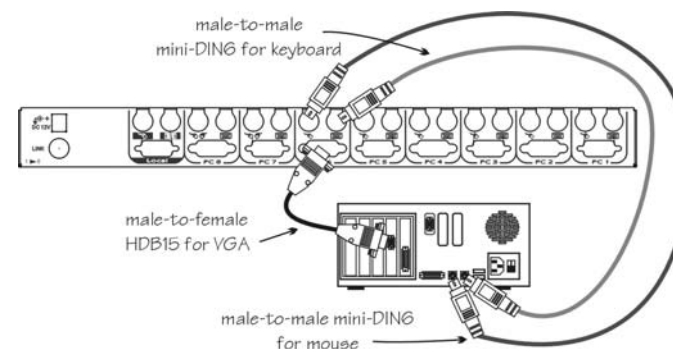


Figure 6: Master computer connection

For computers using serial mouse, connect the *DB-9 to mini-DIN-6 adapter* (included with the switch) to the computer mouse port, then use PS/2 cables to connect the mouse to BLACK BOX, see Figure 7. Connect the computer's monitor cable to the HD-DB-15 VGA connector. **Note:** This function is only available for **PC 7** and **PC 8** marked with two mice.

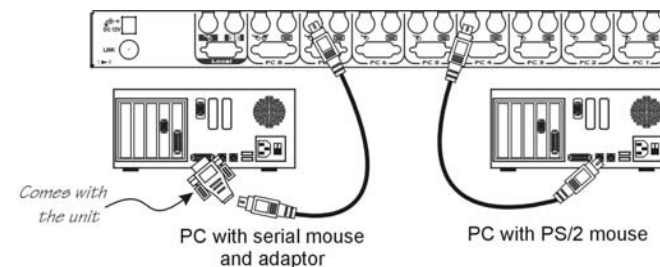


Figure 7: Serial (AT) mouse and PS/2 mouse connection

Hybrid "PS/2 + USB" Model

You can only connect to a computer using either PS/2 or USB port.

To a USB computer: Use a USB A-B cable to connect from one of the PC ports to the USB port of a computer (A connector, flat connector), as shown in Figure 8. The computer can be a USB-ready PC, Sun, HP server, or a Mac.

To a PS/2 computer: Connect a "PS/2 Y-adapter", comes with the unit, to the PS/2 port at PC side, then use two mini-DIN6 male-to-male cables for keyboard and mouse, see Figure 9. There are two mini-DIN6 female connectors on the "PS/2 Y-adapter" marked with keyboard and mouse, be sure not to swap the connections.

To a Laptop computer: In most cases, all you need is one PS/2 male-to-male cable connected between the KVM Switch Module and your Laptop; the Y-adapter is not necessary as shown in Figure 10. However, some Laptop computers do not follow industry standard, please check your Laptop user's manual for detail.

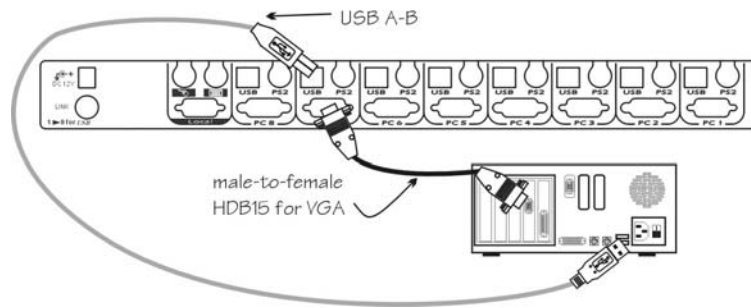


Figure 8: Computer USB Port Connection

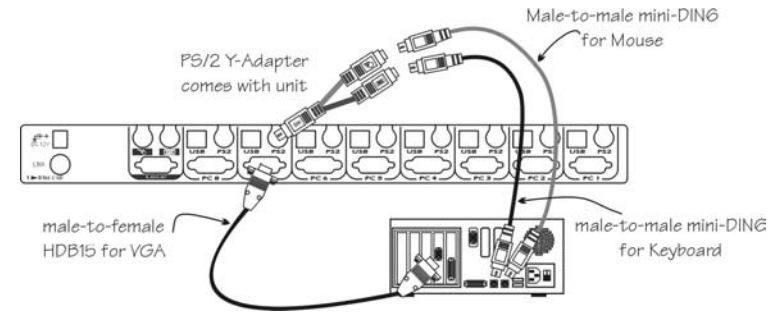


Figure 9: Computer PS/2 Port Connection

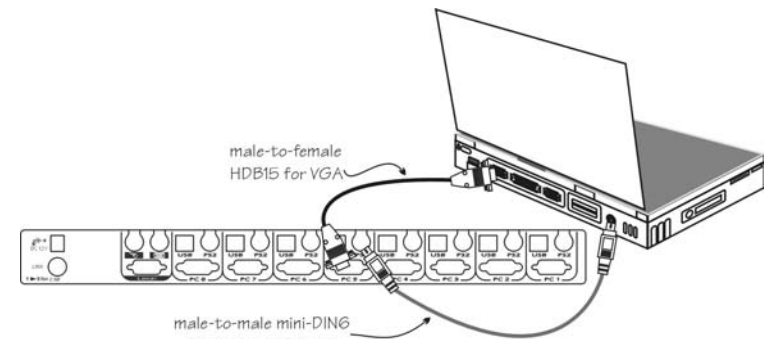


Figure 10: Laptop PS/2 Port Connection

Slim Models

Use only the special cables as shown in Figure 11a and 11b.



Figure 11a: For PS/2 computers



Figure 11b: For USB computers

Connection from a Slim KVM module to a PS/2 computer or a USB computer is shown in Figure 12.

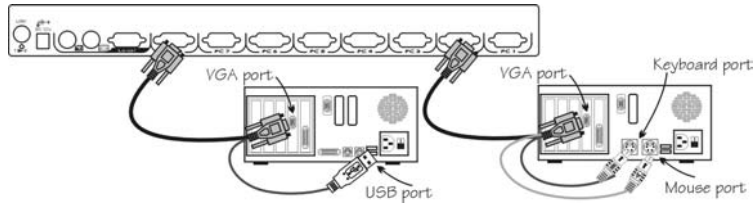


Figure 12: Connections for the special cables

A Module as a Slave or a Stand-alone KVM Switch

A slave BLACK BOX KVM Switch Module may be mounted to the rear vertical poles inside a rack cabinet by the rear brackets (come with the unit except) with connectors to computers facing rear, as Figure 13.

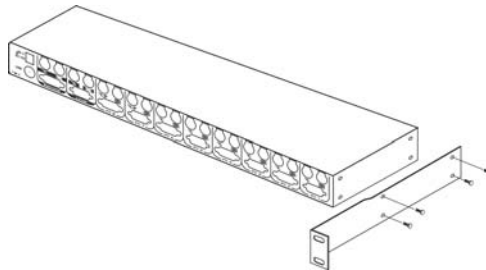


Figure 13: Slave BLACK BOX KVM Switch Module and rear bracket attachment

The connectors (keyboard and mouse) at the **Local** port on the rear of the KVM module are not applicable when the module is connected to the TFT LCD drawer by the C-36 connector. When the C-36 connector is not connected to the TFT LCD drawer, the BLACK BOX KVM switch module acts as a rear-mount stand-alone KVM Switch Module. The VGA ports at the **Local** and **Remote** can be connected to external VGA monitors at any time.

Initial Power-Up

Make sure all computers and BLACK BOX KVM Switch Modules are powered down during the installation. You must power up the Master BLACK BOX before turning on any other devices.

- For single BLACK BOX KVM Switch Module:
 - 1) Apply a power adapter (O/P = 12V DC) to the Master.
 - 2) Turn on computers.
- For cascaded BLACK BOX KVM Switch Module:
 - 1) Apply a power adapter (O/P = 12V DC) to the Master.
 - 2) Apply power adapters (O/P = 9V~12V DC) to all Slaves.
 - 3) Turn on computers.

Note: You may hot plug additional powered-down computer or a slave BLACK BOX KVM Switch Module without turning any existing BLACK BOX or computer off after initial power up.

Operation

Push-Buttons

A computer may be selected by pressing the push button directly, by issuing hotkey commands or by activating the OSD window. The indicator changes to reflect the computer port selected (red). The indicator flashes red when it is in either *Auto Scan* or *Manual Scan* mode.

Note: For 16-port modules: 1 ~ 8 represent the lower 8 ports and A ~ H for the higher 8 ports. Push the same button twice for higher 8 ports, for example, push button 1 twice for port A, and so forth. OSD menu and hotkeys are available for computer selection.

■ 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** and **2** push-buttons for 2 seconds to re-configure the whole system without turning either the BLACK BOX Switch Module or any computer off.

■ AUTO SCAN

BLACK BOX KVM Switch Module provides an easy to use feature to start *Auto Scanning*. You can press down both the front-panel number **7** and **8** buttons for 2 seconds to start Auto Scanning. For 4-port models, press number **3** and **4** instead.

OSD (On-Screen-Display) Operation

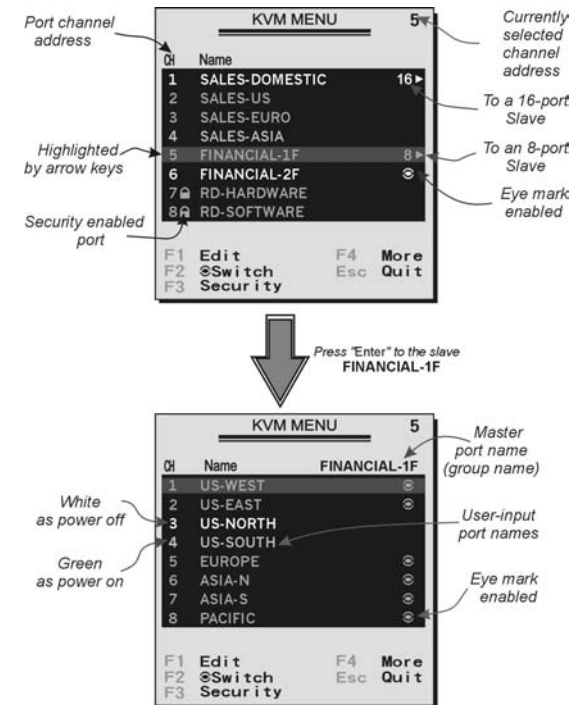


Figure 14: OSD screen illustration
Only Hybrid model offers F5, see Function key F5

By hitting the left **Ctrl** key twice within two seconds, you may see the 'Hotkey Menu' if it is enabled (an OSD option). Or, by hitting the left **Ctrl** key three times within two seconds, you will see a 'KVM MENU' screen showing a list of the computers with corresponding port numbers, names and status, see Figure 14.

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

The color of a device name is green if it has power and is ready for operation, or the color is white as it has no power. OSD menu updates the color when it is activated. Pressing the **PageUp** and **PageDown** keys to view 8 other computers.

Use the “**↑**”, “**↓**”, “**1**” ~ “**8**” or “**A**” ~ “**H**” to highlight a computer and the **ENTER** key to select it. Or, you may press **ESC** 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.

A triangle mark (▶) to the right of a name indicates the port is cascaded to a *Slave*; the number at the left of the triangle mark shows the number of ports the *Slave* has, i.e. **8** ▶ for an 8-port Switch. **ENTER** key brings you one level down and another screen pops up listing the names of the computers on that *Slave*. The name of the *Slave* will be shown at the upper right corner of the OSD menu. It is useful to group computers and still be able to see the group name.

An eye mark (👁) to the right of a name indicating the computer is selected to be monitored in Scan mode. In OSD, this mark can be switched on or off by function key **F2**.

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

- **Function key F1** : To edit name entry of a computer or a *Slave* with up to 14 characters. First, highlight a port then press <F1> followed by name entry. Valid characters are ‘A’~‘Z’, ‘0’~‘9’ and the dash character. Lowercase letters are converted to uppercase ones. Press **BACKSPACE** to delete a letter one at a time. Non-volatile memory stores all name entries until you change, even if the unit is powered down.

- **Function key F2** : To switch the eye mark (👁) of a computer on or off. First, use the **↑** and **↓** arrow keys to highlight it, and then press **F2** to switch its eye mark on or off. If *Scan Type* is ‘Ready PC +👁’, only the power-on and eye mark selected computers will be displayed sequentially in Scan mode.

- **Function key F3** : To lock a computer from unauthorized access. To lock a device, highlight it then press **F3**. Now, enter up to 4 characters (‘A’~‘Z’, ‘0’~‘9’, ‘-’) followed by **ENTER** as new password. A Security-enabled device is marked with a lock (🔒) following its port number. To permanently disable the security

function from a locked device, highlight it, press **F3** then enter the password.

If you want to access the locked device temporarily, simply highlight it and press **ENTER**, the OSD will ask you for the password. After entering the correct password, you are allowed to use the device. This device is automatically re-locked once you switch to another port. During Scan mode, OSD skips the password-protected devices.

- **Function key F4** : More functions are available by hitting **F4**. A new screen pops up displaying more functions as described below. Most of them are marked with a triangle (▶) indicating there are options to choose from. Using the “**↑**” and “**↓**” arrow keys, select the functions and press **ENTER**. Available options will be shown in the middle of the screen. Again, using the “**↑**” and “**↓**” arrow keys to view options then press **ENTER** to select it. You can press **ESC** to exit at any time.

■ *Auto Scan*

In this mode, the BLACK BOX automatically switches from one power-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 till activity stops; it then resumes with the next computer in sequence. To abort the *Auto Scan* mode, press the left **Ctrl** twice, or, press any front 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*

Scan through power-on computers one by one by keyboard control. Type (**F4** :More\Scan Type) determines if scanned computers must also be eye mark selected. Press the up arrow key “**↑**” to select the previous computer and the down arrow key “**↓**” to select the next

computer. Press any other key to abort the Manual Scan mode.

■ *Audio Stick*

An optional multimedia module can be **LINKed** to the back of each BLACK BOX KVM Switch Module for selecting microphone and stereo speaker signals. There are two options for *Audio Stick*: **ON** and **Off**. When set to '**On**', audio selection follows computer selection. When set to '**Off**', audio selection stops following computer selection. It is useful if you want to listen to a particular computer's audio signal while operating other computers. The non-volatile memory stores the *Audio Stick* setting.

■ *Scan Type*

Ready PC +: In Scan mode, scan through power-on and eye mark selected computers.

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

Only: In Scan mode, scan through any 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.

■ *Keyboard Speed*

BLACK BOX offers keyboard typematic setting that overrides the similar settings in BIOS and in Windows. Available speed options are **Low**, **Middle**, **Fast**, and **Faster** as 10, 15, 20, and 30 characters/sec respectively. The non-volatile memory stores the Keyboard Speed setting.

■ *Hotkey Menu*

When you hit the left **Ctrl** key twice within two seconds, the "Hotkey Menu" appears displaying a list of hotkey

commands if the option is **On**. The 'Hotkey Menu' can be turned **Off** if you prefer not to see it when the left **Ctrl** key is hit 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 3 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 name and/or OSD status is displayed on screen during the operation. The actual display position shifts due to the different VGA resolution, the higher the resolution the higher the display position. The non-volatile memory stores the Position setting.

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

■ *Country Code for Sun* <For Slim USB+PS/2 and Hybrid USB+PS/2 models only>

Sun keyboards of different languages have different layouts. The BLACK BOX KVM Switch Module is able to emulate a Sun keyboard for a specific language type (or country: Arabic, Belgian ... US, Yugoslavia). Select the proper country code that matches **ALL** of your Sun computers.

■ *Max. Resolution* <For Slim USB+PS/2 and Hybrid USB+PS/2 models only>

You can adjust the monitor resolution under this sub-menu. There are the following selections: 1024*768, 1280*1024, 1600*1200, 1920*1440, and "DDC2B Disable".

● Function key **F5** : <For Slim USB+PS/2 and Hybrid USB+PS/2 models only>

To switch the **Sun** mark of a port on or off indicating the computer

is a Sun server as shown in Figure 15. Sun servers have more keys on the keyboard than a PC. When a **Sun**-marked port is selected, the KVM Switch starts to translate the keys from a PS/2 keyboard to a Sun keyboard. See *Sun Keyboard Mapping* for detail.

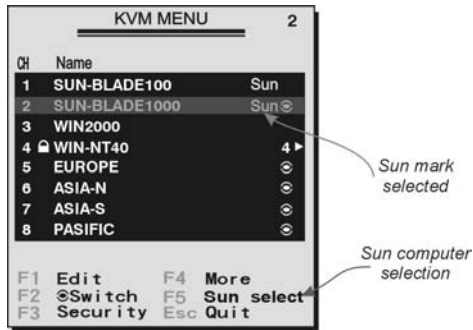


Figure 15: OSD screen for USB+PS/2 model and the Sun mark

- **ESC** : To exit the OSD, press the **ESC** key.

Hotkey commands

Hotkey command is a short keyboard sequence to select a computer, to activate computer scan, etc. BLACK BOX interprets keystrokes for hotkeys all the time. A hotkey sequence starts with two left **Ctrl** keystrokes 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 for error and the bad key sequence will not be forwarded to the selected computer.

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.

L-Ctrl: is the **Ctrl** key located at the left side of the keyboard.

1~8/A~H: are the number keys '1' ~ '8' at the upper row of the keyboard and character keys 'A' ~ 'H' case insensitive. Do not use the keypad at the right of the keyboard.

- To select a computer by hotkey command, you must know its port number, which is determined by the BLACK BOX KVM Switch Module connection. For a computer connected to a *Master*, its port is represented by the PC port label (1~8 or A~H). For a computer connected to a *Slave*, two characters represent its port. The first character is the port number of the *Master* unit (1~8) and the second one is the port number of the *Slave* (1~8 or A~H). Please note that only *Master's* 'PC 1' ~'PC 8' ports can be connected to a *Slave*.

Left **Ctrl** left **Ctrl** **7**

Selects a computer connected to port 7 of the *Master*.

Left **Ctrl** left **Ctrl** **6 C**

Selects a computer connected to port C of a *Slave* connected to port 6 of the *Master*.

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

Left **Ctrl** left **Ctrl** **F1**

When *Auto Scan* detects any keyboard or mouse activity, it

suspends the scanning till activity stops; it then resumes with the next computer in sequence. The length of the *Auto Scan* interval (*Scan Rate*) is adjustable, see below. To abort the *Auto Scan* mode, press the left **Ctrl** key twice.

Note: *Scan Type* determines whether an eye-marked computer is to be displayed during **Auto Scan**.

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

Left **Ctrl** left **Ctrl** **F2**

Press “**↑**” or “**↓**” to select the previous or the next computer in sequence. And, press any other key to abort the *Manual Scan*.

Note: *Scan Type* determines whether an eye-marked computer is to be displayed during **Auto Scan**.

- To adjust *Scan Rate*, setting the duration before switching to the next computer in *Auto Scan*:

Left **Ctrl** left **Ctrl** **F3**

The BLACK BOX sends one to four beeps indicating scan interval of **3**, **8**, **15**, and **30** seconds respectively.

- To adjust keyboard typematic rate (characters/sec), this setting over-rides that of BIOS and any operating system:

Left **Ctrl** left **Ctrl** **F4**

The BLACK BOX generates 1 to 4 beeps corresponding to **10**, **15**, **20**, and **30** characters/sec respectively.

- Audio Stick**

An optional multimedia module can be LINKed to the back of each BLACK BOX for selecting microphone and stereo speaker signals. There are two options for *Audio Stick*: **ON** and **Off**. When set to 'On', audio selection follows computer selection. When set to 'Off', audio selection stops following computer selection. It is useful if you want to listen to a particular computer's audio signal while operating other computers.

Left **Ctrl** left **Ctrl** **F5**

The BLACK BOX generates 1 or 2 beeps corresponding to **On** and **Off** respectively.

Cascade Configuration

Connection

Before connecting a device (a computer or a Slave KVM Switch Module) to the Master BLACK BOX KVM Switch Module under power, you must turn off the device.

Note: The Master must have equal or more 'PC x' ports than that of the Slave.

The ports labeled "PC 1"~"PC 8" can be connected to either a computer or a Slave's LOCAL (or CONSOLE) port, as shown in figure 16. The ports "PC A"~"PC H" can only be connected to computers.

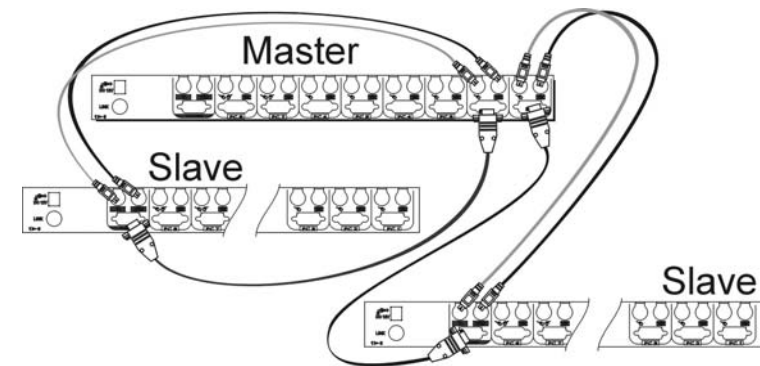


Figure 16: Slave console connection

Note: Only Master's PS/2 PC ports (not USB ports) can be connected to a Slave's LOCAL (or CONSOLE) port for cascade application.

The maximum number of computers controlled by a master/slave configuration with all 8-port units is 64 -- with 8 Slaves and each Slave connects to 8 computers, see Figure 17.

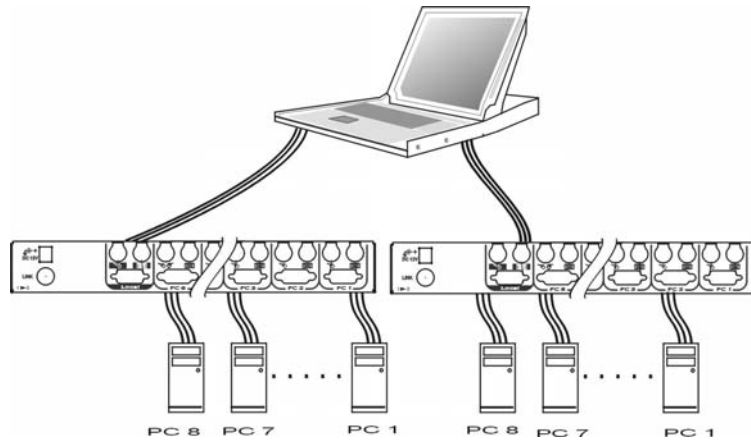


Figure 17: Cascaded 8-port BLACK BOX KVM Switch

Modules

For OSD menu:

After connection completes, you should re-activate the OSD menu to check if the *Master* recognizes the *Slaves*. A triangle mark (▶) is placed to the right of the channel name indicating the port is connected to a *Slave not* a computer. A number to the left of the triangle mark indicates the *Slave* model, i.e. 8 ▶ for an 8-port Switch Module.

Change Configuration while Running

A device (a computer or a KVM Switch Module) at any 'PC x' port can be changed at any time after initial power-up. If you change any one of the "PC 1" to "PC 8" ports connection from a computer to a *Slave* or vice versa, or replace the devices of a port; the OSD will update this change the next time it is activated.

Note: Any new device must be turned off before it is connected to the *Master*.

Multi-access Model

Overview

It offers two Console ports facilitating you to access multiple computers from one out of 2 locations- **Local** and **Remote**. Now you can access all computers either inside a server room when you have to physically access the computers such as software upgrade, or outside the server room for daily use.

Connection

- The module connects to a TFT LCD drawer: The **Remote** console is available for a second set of keyboard, mouse, and monitor.
- The module is a stand-alone KVM Switch Module: Both **Remote** and **Local** consoles are available for keyboards, mice and monitors connection.

Operation

On power up, the BLACK BOX KVM Switch Module is in idle mode broadcasting VGA signal and detecting for keyboard and mouse activity. User LEDs (A and B) are both red indicating the BLACK BOX KVM Switch Module is not in use. When keyboard or mouse activity is detected at one console (**Remote** or **Local**), the BLACK BOX KVM Switch Module immediately disables the other console from accessing the computer. Only one LED (**Remote** or **Local**), at the left side of the panel, remains lit indicating the KVM Switch Module is under user operation. In the mean time, keyboard LEDs (Num/Caps/Scroll Lock) of the *other* console start to flash as its access is denied and the monitor is blocked from VGA signal for security reason. After the user has finished his operation for a period of time (i.e., *User Timeout*), the multi-access KVM Switch Module returns to idle mode. *User Timeout* has four options, **5 sec**, **30 sec**, **60 sec**, and **HOLD**. Select **HOLD** when you plan to access the KVM Switch Module for a long time. Pressing the <Scroll Lock> twice forces the KVM Switch Module return to idle mode immediately.

The *User Timeout* is available in the OSD menu by pressing the Function key **F4**, under the sub-menu **More**. **Note:** *Keyboard Speed* option is not available for multi-access models.

Sun/Mac Keyboard Mapping

The KVM Switch emulates a Sun's keyboard and mouse when a computer is marked with a **Sun** in OSD menu by Function key **F5**. A Sun keyboard has more keys than a standard PS/2 one. These extra keys are simulated by tapping the lower-right **Ctrl** followed by one of the function keys on a PS/2 keyboard (i.e. combo key). For instance, tap the lower-right **Ctrl** key, then tap the function key **F7** to activate **Open** for a Sun computer.

From PS/2 keyboard	Map to Sun keyboard	Map to Mac keyboard
right - Ctrl 1		
right - Ctrl 2		
right - Ctrl 3		
right - Ctrl 4		< power
right - Ctrl F1	Stop	
right - Ctrl F2	Again	
right - Ctrl F3	Props	
right - Ctrl F4	Undo	
right - Ctrl F5	Front	
right - Ctrl F6	Copy	
right - Ctrl F7	Open	
right - Ctrl F8	Paste	
right - Ctrl F9	Find	
right - Ctrl F10	Cut	
Print Screen		F13
Scroll Lock		F14
Pause Break		F15
right - Ctrl H	Help	
right -	right -	right -
left -	left -	left -
	Compose	
right - Alt	Alt Graph	right - Option
left - Alt	Alt	left - Option

Note: For Sun: The switch Module does not support **LowPower** option under **Power Off Select** after the command right - **Ctrl** 4 .

* For Japanese keyboard: The leading key for the Combo Key is replaced by.

Appendices

Specifications:

Standard models

Specifications	Standard				
	1-Console		2-Console		
User port number	1		2		
Computer port number	--	8	16	8	16
Cascade control PC number	--	Up to 64*	Up to 136*	Up to 64*	Up to 136*
On-screen display (OSD)	No	Yes			
Push button control	--	8, available when connected to a KVM drawer			
Hot plug-and-play	Yes				
Hotkey control	Yes				
Rack-mounted	Yes, 19" industry-standard				
Automatic scan interval	3, 8, 15, 30 seconds				
Programmable scan pattern	Yes				
Cable length (Max)	30M (100ft) at CONSOLE 30M (100ft) at PC ports				
VGA bandwidth	1920 x 1440, DDC2B				
LCD KVM drawer connector	C-36				
Computer connector	Keyboard	PS/2			
	mouse	PS/2, serial (with adapters for 2 ports)			
	monitor	HDB-15 male			
Console connector	Keyboard	PS/2			
	mouse monitor	PS/2			
		HDB-15 female			
H x W x D (mm)	40 x 404 x 114	80 x 404 x 114	40 x 404 x 114	80 x 404 x 114	
(in.)	1.6 x 15.9 x 4.5	3.1 x 15.9 x 4.5	1.6 x 15.9 x 4.5	3.1 x 15.9 x 4.5	
Rear-mount brackets	1U-height, included				
size	1U	2U	1U	2U	
Power supply (min)	12V DC, 3A (when connected to a TFT LCD drawer) 9 ~ 12V DC, 500mA (NOT connected to a TFT LCD drawer)				

Hybrid models

Specifications		Hybrid	
User port number		1	1
Computer port number		8	16
Cascade control PC number		Up to 64*	Up to 136*
Cable type		Standard	
Applicable to computer		PS/2 PC, Sun†, Mac	
On-screen display (OSD)		Yes	
Push button control		8, available when connected to a KVM drawer	
Hot plug-and-play		Yes	
Hotkey control		Yes	
Rack-mounted		Yes, 19" industry-standard	
Automatic scan interval		3, 8, 15, 30 seconds	
Programmable scan pattern		Yes	
Cable length (Max)		30M (100ft) at CONSOLE 30M (100ft) at PC ports for PS/2 5M at PC ports for USB	
VGA bandwidth		1920 x 1440, DDC2B	
TFT LCD KVM drawer connector		C-36	
Computer connector	Keyboard + mouse monitor	PS/2 x 8, USB x 8, HDB-15 male x 8	PS/2 x 16, USB x 16, HDB-15 male x 16
Console connector	Keyboard mouse monitor	PS/2 PS/2 HDB-15 female	
H x W x D (mm) (in.)		40x404x114 1.6x15.9x4.5	80x404x114 3.1x15.9x4.5
Rear-mount brackets size		1U-height, included	
Power supply (min)		12V DC, 3A (when connected to a TFT LCD drawer) 9 ~ 12V DC, 500mA (NOT connected to a TFT LCD drawer)	

* Maximum control when cascaded with models of the same type.

† For USB-ready Sun computers.

Slim models

Specifications		Slim PS/2			Slim USB-PS/2		
User port number		1	1	1	1	1	1
Computer port number		4	8	16	4	8	16
Cascade control PC number		Up to 32*	Up to 64*	Up to 136*	Up to 32*	Up to 64*	Up to 136*
Cable type		Special 3-in-1, HDB15 for PS/2			Special 3-in-1, HDB15 for PS/2 or for USB		
Applicable to computer		PS/2 PC			PS/2 PC, Sun†, Mac		
On-screen display (OSD)		Yes					
Push button control		8, available when connected to a KVM drawer					
Hot plug-and-play		Yes					
Hotkey control		Yes					
Rack-mounted		Yes, 19" industry-standard					
Automatic scan interval		3, 8, 15, 30 seconds					
Programmable scan pattern		Yes					
Cable length (Max)		30M (100ft) at CONSOLE 15M (50ft) at PC ports for PS/2 5M at PC ports for USB					
VGA bandwidth		1920 x 1440, DDC2B					
TFT LCD KVM drawer connector		C-36					
Computer connector	Keyboard + mouse + monitor	HDB-15 female x 4 (blue-gray)	HDB-15 female x 8 (blue-gray)	HDB-15 female x 16 (blue-gray)	HDB-15 female x 4 (gray)	HDB-15 female x 8 (gray)	HDB-15 female x 16 (gray)
Console connector	Keyboard mouse monitor	PS/2 PS/2 HDB-15 female					
H x W x D (mm) (in.)		40 x 404 x 114 1.6 x 15.9 x 4.5					
Rear-mount brackets size		1U-height, included					
Power supply (min)		12V DC, 3A (when connected to a TFT LCD drawer) 9 ~ 12V DC, 500mA (NOT connected to a TFT LCD drawer)					

* Maximum control when cascaded with models of the same type.

† For USB-ready Sun computers.

Troubleshooting:

Ensure that all cables are well seated. Check that keyboard/mouse cables are not swapped. Label and bundle the cables for each computer to avoid confusion when connected to the BLACK BOX.

Symptom	Possible causes	Recommended solutions
Nothing works.	Bad connection at the C-36 connectors.	Push the assembled drawer and the KVM module box firmly together leaving only 8mm (5/16 inch) space in between. Be sure they are secured by two screws.
VGA monitor works fine but keyboard and touch pad does not work.	Another keyboard or mouse is connected to the rear side of the KVM module box (marked with Local) when the C-36 connector is connected to the KVM drawer. Connection inside the KVM drawer becomes loose due to vibration.	If the C-36 connector on the KVM module box connects to a KVM drawer, its Local console should not connect to any keyboard or mouse. Verify if the KVM drawer is bad by disconnecting it from the KVM module box (the C-36 connector is not connected). Connect a keyboard, mouse, and monitor to the Local port on the KVM module box and another computer to any of the PC ports and use the KVM module box as a stand-alone KVM Switch.
No screen image, or no OSD menu	A power-on computer is not selected. External power supply is not connected, No power to BLACK BOX.	Turn on a computer and select it by the front push-buttons. Apply power to the system via the external power supply. Press the front push buttons to select a computer. A red rectangle, part of the OSD function, should pop up displaying the port number as the system is properly powered. Connect a VGA monitor to the LOCAL port at the rear and check if the VGA signal presents.

Unable to operate USB-ready Sun server.	Incorrect KVM module.	Use only the hybrid PS/2 + USB KVM module. Invoke the OSD menu, move the light bar to the port, press F5 to set the Sun mark on.
Keyboard error on boot.	Loose keyboard connection.	Make sure keyboard cables are Well seated.
Alphabets on the TFT LCD display are blur or have shadows.	Improper resolution settings.	Set the VGA resolution of the computers to 1024 x 768 with "Large Font" for the best performance.
I forget the password.	Bad memory.	Consult the dealer. Memorize the password.
Master/slave does not work.	Improper installation procedures.	Make sure slave's CONSOLE is connected to <i>Master's</i> PC 1~ PC 8 port. Only PS/2 ports can be used for cascade connection. Press and hold the 1 and 2 push-buttons to initiate K/M reset. Remove any possible power supply to the slave (unplug all cables), before connecting it to the <i>Master</i> .
Keyboard strokes shifted.	The computer was in shifted state when last switched.	Press both SHIFT keys.
The ↑ and ↓ keys do not work in <i>Manual Scan</i> .	All PCs are off or only one PC is turned on. <i>Scan mode</i> works for power-on computers only. <i>Scan type</i> is eye mark selected but no PC is eye mark selected in OSD.	Turn computers on. Press any other key to abort <i>Manual Scan</i> mode. Set proper <i>Scan type</i> in OSD and determine which PCs are eye mark selected, do it in OSD.
<i>Auto Scan</i> does not switch PC and BLACK BOX beeps from time to time and red indicator flashes.	All PCs are off or only one PC is turned on. <i>Scan mode</i> works for power-on computers only. <i>Scan type</i> is eye mark selected but no power-up PC is eye mark selected in OSD.	Turn on computers. Set proper <i>Scan Type</i> in OSD and determine which PCs are eye mark selected, do it in OSD. Press left Ctrl key twice to abort <i>Auto Scan</i> mode. Press any front button to select a PC, and <i>Auto Scan</i> stops.
Double OSD	Improper slave	Press push-buttons 1 and 2

images at cascade configuration.	connection procedure.	down for 2 seconds to activate K/M RESET. Remove any possible power supply to the <i>Slave</i> (unplug all cables), before connecting it to the <i>Master</i> .
OSD menu is not at the proper position.	OSD menu has fixed resolution and its size varies as computer VGA resolution changes.	Use F4 : More\Position to select UL or UR. OSD menu may appear near the middle of the screen when LL or LR is selected.
Computer can not use serial mouse.	Loose mouse adapter.	Secure the mouse adapter to computer's COM port.
	Incorrect mouse adapter.	Use only the mouse adapter comes with the unit.
	Incorrect PC port connection.	The mouse conversion is only effective at PC ports 7 and 8.
Can not select a computer connected to a slave.	Improper <i>Master</i> unit connection.	Only <i>Master</i> ports PC1~PC8 can be connected to slaves.
	Improper slave unit connection.	Connect slave CONSOLE port to PC1~PC8 ports of the <i>Master</i> .
	Too many levels of slaves.	Only one level of slave units is allowed. Pop up OSD again to check if <i>Master</i> recognizes the slave connection. Look for triangle mark and the number before it.
The BLACK BOX fails to function occasionally.	The system is not getting enough power	Make sure the external power supply is properly connected.

From PS/2 keyboard	Map to Sun keyboard
right - Ctrl 1	
right - Ctrl 2	
right - Ctrl 3	
right - Ctrl 4	
right - Ctrl F1	Stop
right - Ctrl F2	Again
right - Ctrl F3	Props
right - Ctrl F4	Undo
right - Ctrl F5	Front
right - Ctrl F6	Copy
right - Ctrl F7	Open
right - Ctrl F8	Paste
right - Ctrl F9	Find
right - Ctrl F10	Cut
right - Ctrl H	Help
right -	right -
left -	left -
	Compose
right - Alt	Alt Graph
left - Alt	Alt

From PS/2 keyboard	Map to Mac keyboard
right - Ctrl 4	power
Print Screen	F13
Scroll Lock	F14
Pause Break	F15
right -	right -
left -	left -
right - Alt	right - Option
left - Alt	left - Option

