

ALTUSEN by ATEN

**HIGH DENSITY
KVM SWITCH**

USER MANUAL

KH88



FCC Information




This is an FCC Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC

Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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Package Contents

The complete KH88 package contains the following components:

- ◆ 1 KH88 KVM Switch
- ◆ 1 Power Cord
- ◆ 1 Rack Mounting Kit
- ◆ 1 User Manual
- ◆ 1 Quick Start Guide
- ◆ 1 Warranty Registration Card

Check to make sure that all the components are present and in good order. If anything is missing, or was damaged in shipping, contact your dealer.

Read this manual thoroughly and follow the installation and operation procedures carefully to prevent damage to the switch or any of the devices that connect to it.

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About This Manual

This User Manual is provided to help you get the most from your KH88 system. It covers all aspects of installation, configuration and operation. An overview of the information found in the manual is provided below.

Overview

Chapter 1, Introduction, introduces you to the KH88 System. Its purpose, features and benefits are described.

Chapter 2, Hardware Setup presents the front and back panel components, and explains how to set up your installation — from a basic single stage hookup to a complete three stage operation.

Chapter 3, OSD Operation, provides a complete description of the KH88's OSD (On Screen Display), and how to work with it.

Chapter 4, Hotkey Operation, details all of the concepts and procedures involved in the

Hotkey operation of your KH88 installation.

Chapter 5, The Firmware Upgrade Utility, explains how to use this utility to upgrade to the KH88's firmware with the latest available versions.

Appendixes at the end of the manual provide technical and other important information regarding the KH88.

Conventions

This manual uses the following conventions:

- `Courier` Indicates text that you should key in.
- [] Indicates keys you should press. For example, [Enter] means to press the **Enter** key. If keys need to be *chorded*, they appear together in the same bracket with a plus sign between them: [Ctrl+Alt].
- 1. Numbered lists represent procedures with sequential steps.
- ◆ Bullet lists provide information
- > Indicates selecting an option on a menu. For example, Start > Run means to open the *Start* menu, and then select *Run*.
- ▲ Indicates critical information.

Getting Help

For additional help, advice, and information, ALTUSEN provides several support options. If you need to contact ALTUSEN technical support with a problem, please have the following information ready beforehand:

- ◆ Product model number, serial number, and date of purchase.
- ◆ Your computer configuration, including operating system, revision level, expansion cards, and software.
- ◆ Any error messages displayed at the time the error occurred.
- ◆ The sequence of operations that led up to the error.
- ◆ Any other information you feel may be of help.

ALTUSEN Technical Support

North America Technical Phone Support	Registered ALTUSEN product owners are entitled to telephone technical support. Call the ALTUSEN Technical Support Center: 949-453-8885.
International Technical Phone Support	1. Contact your local dealer. 2. Call the ALTUSEN Technical Support Center: 1-949-453-8885.
Email Support	Email your questions and concerns to: support@altusen.com
Online Troubleshooting	The ALTUSEN support website: http://www.altusen.com/support provides online troubleshooting that describes the most commonly encountered problems and offers possible solutions to them.
Online Documentation	User Manuals are available electronically at the ALTUSEN support website: http://www.altusen.com/support
Software Updates	Download the latest drivers and firmware for your product from the ALTUSEN support website: http://www.altusen.com/support

Product Information

For information about all of ALTUSEN's products and how they can help you connect without limits, visit ALTUSEN on the web at <http://www.altusen.com>

ALTUSEN Authorized Resellers

ALTUSEN provides the following ways to find an authorized reseller in your area:

- ◆ In the United States of America, call: 866-ALTUSEN
- ◆ In Canada and South America, call: 949-453-8885
- ◆ In all other locations, call: 886-2-8692-6789
- ◆ Visit ALTUSEN on the web at <http://www.altusen.com> for a list of locations and telephone numbers

Chapter 1.

Introduction

Overview

The KH88 KVM Switch is a control unit that allows access to multiple computers from a single console (keyboard, monitor, and mouse). Before the development of KVM switching, the only way to control multiple computer configurations from a single console was through a complex and costly network. Now, with the KH88, you can easily access multiple computers in a cost effective manner.

A single KH88 can control up to 8 computers. Since units can be cascaded to three levels, in a full three stage installation up to 73 KH88s can control up to 512 computers - all from a single console.

Setup is fast and easy; plugging cables into their appropriate ports is all that is entailed. There is no software to configure, so there is no need to get involved in complex installation routines or be concerned with incompatibility problems. Since the KH88 intercepts keyboard input directly, it works on any hardware platform and with all operating systems.

There are three convenient methods to access any computer connected to the installation: (1) using the push button port selection switches located on each unit's front panel; (2) entering *Hotkey* combinations from the keyboard; and (3) selecting from menus provided by the On Screen Display (OSD). A powerful *Auto Scan* feature also permits automatic scanning and monitoring of the activities of all computers running on the installation one by one.

There is no better way to save time and money than with a KH88 installation. By allowing a single console to manage all the attached computers, a KH88 installation: (1) eliminates the expense of having to purchase a separate keyboard, monitor, and mouse for each computer; (2) saves all the space those extra components would take up; (3) saves on energy costs; and (4) eliminates the inconvenience and wasted effort involved in constantly moving from one computer to another.

Features

- ◆ Controls 8 computers from a single console
- ◆ Cascadable to three levels from any port - control up to 512 computers from a single console
- ◆ Administrator/User password authorization for enhanced security protection (PSP)
- ◆ Intelligent OSD (On Screen Display) and hotkey switching for efficient system handling
- ◆ No software required - computer selection via front panel switches, hotkeys, or On Screen Display (OSD)
- ◆ Auto Scan feature for monitoring user-selected computers
- ◆ Hot pluggable - add or remove computers without powering off the switch
- ◆ PS/2 mouse emulation for system bootup
- ◆ Console's PS/2 mouse controls all connected computers
- ◆ PS/2 compatible mouse support - Microsoft Intellimouse Explorer and Logitech FirstMouse+ support*
- ◆ Superior video quality: up to 2048 x 1536; DDC; DDC2; DDC2B
- ◆ Supports LCD suspend mode
- ◆ Low power warning
- ◆ Detachable front panel module for convenient rack mounting and management
- ◆ Rack mountable in 19" (1U) system rack
- ◆ Patented ASIC Design for Enhanced Functionality and Compatibility

- * 1. PS/2 compatible mouse support is for three button (wheel) mice.
- 2. The Logitech Mouse Ware program's Change Device procedure does not work on Microsoft NT systems.

Hardware Requirements

Console

- ◆ A VGA, SVGA, or Multisync monitor capable of the highest resolution that you will be using on any computer in the installation.
- ◆ A PS/2 style mouse
- ◆ A PS/2 style keyboard

Computer

The following equipment must be installed on each computer:

- ◆ A VGA, SVGA or Multisync card.
- ◆ A 6-pin mini-DIN (PS/2 style) mouse port.
- ◆ A 6-pin mini-DIN (PS/2 Style) keyboard port with +5V DC on pin 4 and Ground on pin 3, *or* a 5-pin DIN (AT Style) keyboard port with +5V DC on pin 5 and ground on pin 4.*

* See the note under Cables in the next section.



Cables

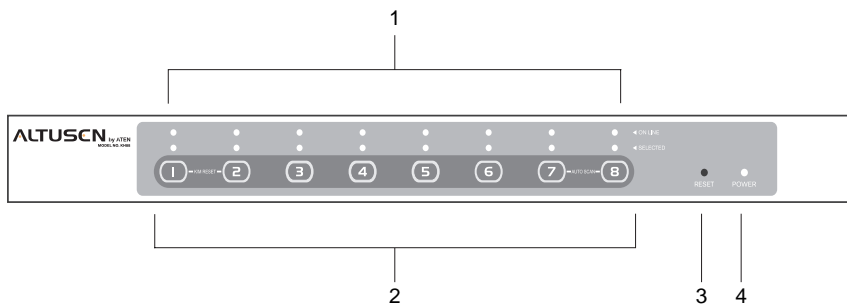
Use of substandard cables may damage the connected devices or degrade overall performance. For optimum signal integrity and to simplify the layout, we strongly recommend that you use the following high quality CS Custom Cable sets:

Cable Purpose	Part Number
Connect to Computer	2L-1001P/C (1.8m) or 2L-1003P/C (3m)
Cascading	

- Note:** 1. The KH88 does not support serial mice. You cannot use Serial-to-PS/2 adapters with the cables. Attempts to do so will not work.
2. If your computer uses an AT style keyboard socket you will need to purchase a PS/2-to-AT keyboard adapter (Part No. 2A-106, or any standard keyboard adapter), in order to plug the cable into the computer's keyboard port.

Chapter 2. Hardware Setup

Front Panel



1. Port LEDs

The upper Port LEDs are the On Line LEDs; the lower ones are the Selected Port LEDs:

- ◆ The *On Line* LEDs light GREEN to indicate that the computer attached to the corresponding port is up and running. If the LED is flashing, it indicates that the Port is being used for cascading to another KH88 switch (see *Two Stage Installation*, p. 9).
- ◆ The *Selected* LEDs light ORANGE to indicate that the computer attached to the corresponding port is the one that has the KVM focus. The LED is steady under normal conditions, but flashes when its port is accessed under *Auto Scan Mode* (see *F7 SCAN*, p. 27).

2. Port Selection Switches

Press a switch to access the computer attached to the corresponding port.

- ◆ Pressing Buttons 1 and 2 simultaneously for 3 seconds performs a *Keyboard and Mouse Reset*.
- ◆ Pressing 7 and 8 simultaneously starts *Auto Scan Mode* (see p. 27).



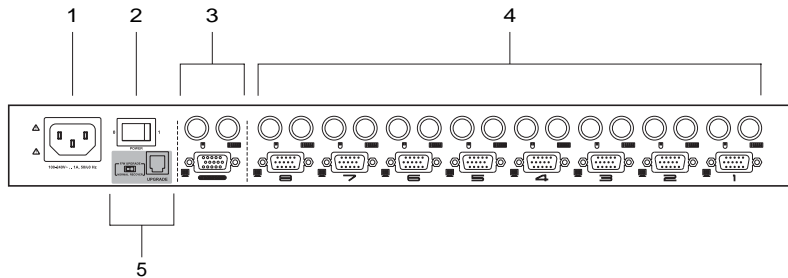
3. Reset

- ◆ Use a thin object (such as the end of a paper clip, or a ballpoint pen), to press this recessed switch in to initiate a warm reset.
- ◆ If the switch is kept in for longer than three seconds, a cold reset takes place.

4. Power LED

- ◆ Lights steadily to indicate that the unit is receiving power.
- ◆ Flashes to indicate a low power condition.

Rear Panel



1. Power Socket

2. Power Switch

3. Console Port Section

- ◆ If this is a first station unit, your monitor, keyboard and mouse plug in here.
- ◆ If this is a daisy chained unit, the cables that link back to a port on a higher KH88unit plug in here.

4. CPU Port Section

The cables that link to the computers plug in here.

5. Firmware Upgrade Section

- ◆ Firmware Upgrade Switch
During normal operation this switch should be in the NORMAL position.
- ◆ Firmware Upgrade Port
The Firmware Upgrade Cable that transfers the firmware upgrade data from the administrator's computer to the KH88 plugs into this RJ-11 connector.
- ◆ See p. 35 for firmware upgrading details.

Installation

Before you Begin

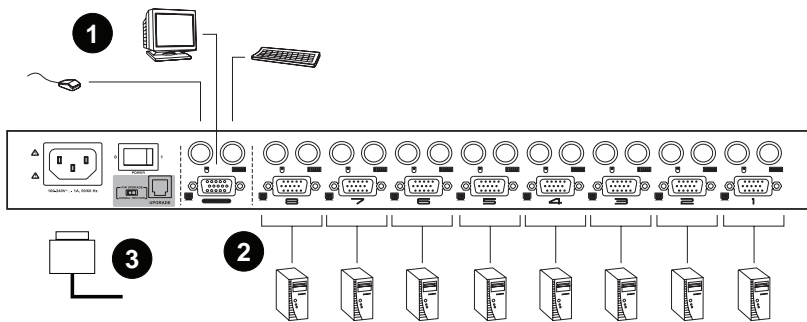


1. Make sure that power to all the devices you will be connecting up have been turned off. You must unplug the power cords of any computers that have the *Keyboard Power On* function.
2. To prevent damage to your installation, make sure that all devices on the installation are properly grounded.

Single Station Installation

In a Single Stage installation, there are no additional KH88's cascaded down from the first unit. To set up a single stage installation refer to the diagram below (the numbers in the diagram correspond with the numbers of the instruction steps), and do the following:

1. Plug your keyboard, mouse, and monitor into the unit's Console Ports.
2. Use KVM cable sets (as described in the *Cables* section on p. 4), to connect any available KH88 CPU Port to the Keyboard, Video and Mouse ports of the computer you are installing.
3. Plug the power cord that came with this package into the KH88's Power Socket, and then into an AC power source.
4. Power on the KH88.
5. Turn on the power to the computers.



Two Stage Installation

To control even more computers, up to eight additional KH88 units can be cascaded from the CPU ports of the First Stage unit. The cascaded KH88s that connect back to the First Stage unit are considered Second Stage units.

As many as 64 computers can be controlled in a complete two stage installation. A table showing the relation between the number of computers and the number of KH88 units needed to control them is provided on p. 43.

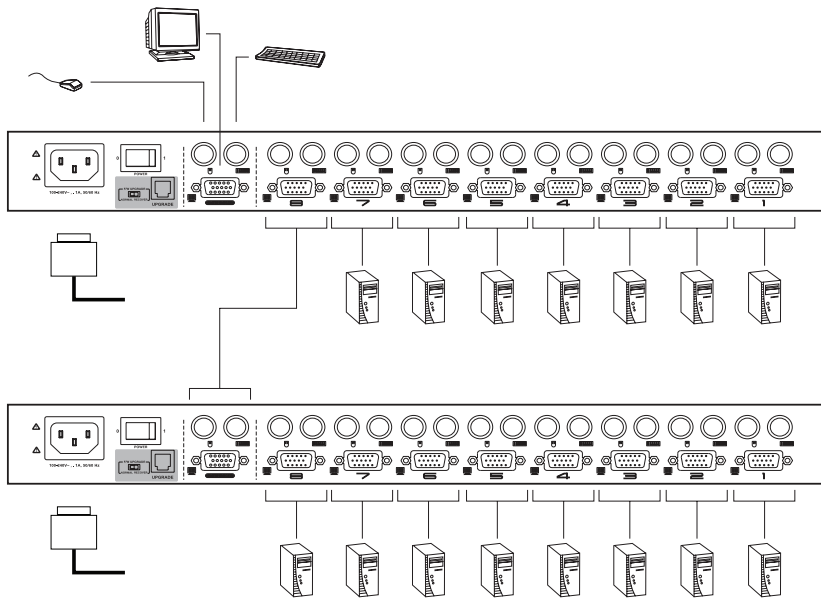
- Note:**
1. Mixing different KVM switch models on the same installation can cause problems with OSD port switching. We strongly recommend that all cascaded units be the same model as the First Stage unit.
 2. If you are adding this switch into an already existing KH88 configuration, be sure to make it the First Stage unit. Otherwise, you won't get the benefit of its improved OSD features and functions.

To set up a two stage installation, do the following:

1. Make sure that power to all the devices you will be connecting up, including all preexisting devices on the installation, have been turned off.
2. Use a KVM cable set (described in the *Cables* section, p. 4), to connect any available CPU Port on the First Stage unit to the Console Port connectors of the Second Stage unit.
3. Use KVM cable sets (described in the *Cables* section, p. 4), to connect any available CPU port on the Second Stage unit to the Keyboard, Video, and Mouse ports of the computers you are installing.
4. Plug the power cord that came with this package into the KH88's Power Socket, and then into an AC power source.
5. Repeat these steps for any other Second Stage units you wish to connect.

6. Power on the Second Stage unit(s), then power on the First Stage unit.
7. Turn on the power to all the computers.

Note: The Power On sequence requires that all Second Stage units be powered on first. After all the Second Stage units have been powered on, the First Stage unit must be powered on next. After the Second and First stage units have been powered on, the computers can be powered on.



Three Stage Installation

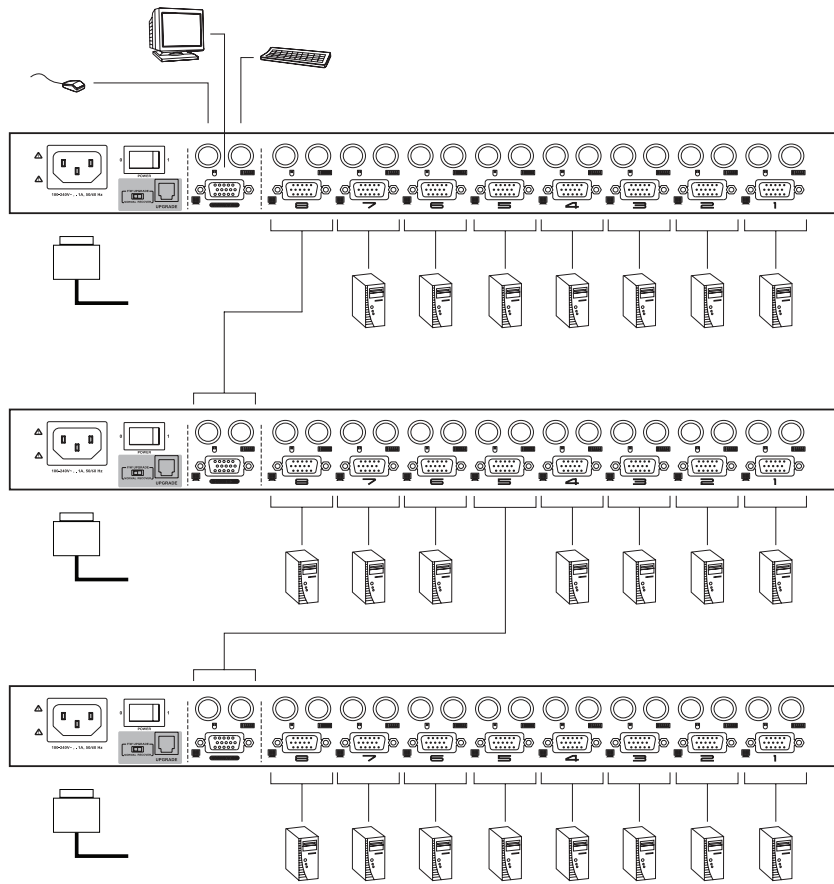
The procedures for setting up a three stage installation are essentially the same as for a two stage installation. With a three stage setup, as many as 512 computers can be controlled in a complete installation. A table showing the relation between the number of computers and the number of KH88 units needed to control them is provided on p. 43.

- Note:** 1. See Notes 1 and 2 at the beginning of the *Two Stage Installation* section.
2. KH88 units cannot be cascaded beyond the third level.

To set up a three stage installation, do the following:

1. Make sure that power to all the devices you will be connecting up, including all preexisting devices on the installation, have been turned off.
2. Use a KVM cable set (described in the *Cables* section, p. 4), to connect any available CPU Port on the Second Stage unit to the Console Port connectors of the Third Stage unit.
3. Use KVM cable sets (described in the *Cables* section, p. 4), to connect any available CPU port on the Third Stage unit to the Keyboard, Video, and Mouse ports of the computers you are installing, as shown in the diagram on page 12.
4. Plug the power cord that came with this package into the KH88's Power Socket, and then into an AC power source.
5. Repeat these steps for any other Third Stage units you wish to connect.
6. Power on the Third Stage unit(s); next, power on the Second Stage units; finally, power on the First Stage unit.
7. Turn on the power to all the computers.

Note: The Power On sequence requires that all Third Stage units be powered on first. After they are all on, the Second Stage units must be powered on next. After all the Second Stage units are on, the First Stage unit must be powered on. Only after all the KH88s have been powered on following this sequence, can the computers be powered on.



Setup Considerations

Hot Plugging

The KH88 supports hot plugging. Components can be removed and added back into the installation by unplugging and replugging their cables from their respective ports without the need to shut the switch down. For hot plugging to work properly, the following procedures must be observed:

Hot Plugging CPU Ports:

When hot plugging cables from the CPU ports:

1. The cable must be plugged back into the *same port* it was removed from.
2. The mouse cable must be plugged in before the keyboard cable.
3. After plugging the cable back in, you must perform a **KVM Reset** on the First Stage unit (by pressing the Reset switch In).

Hot Plugging Console Ports:

The unit supports hot plugging of the keyboard, monitor, and mouse. When hot plugging the mouse from the KH88's console mouse port:

1. You may unplug the mouse and plug it back in again (to reset the mouse, for example), as long as you use the *same mouse*.
2. If you plug in a different mouse, all the stations and all the computers on the installation must be shut down for 10 seconds, then restarted. (Refer back to the note describing the Power On sequence on p. 11, if necessary.)

Note: If, after hot plugging (or at any other time), there is no response to mouse and/or PS/2 keyboard input, simultaneously press and hold Port Select buttons 1 and 2 on the First Stage unit for 3 seconds to perform a PS/2 Keyboard and PS/2 Mouse reset.



Powering Off and Restarting

If it becomes necessary to Power Off one of the KH88 units, before starting it back up you must do the following:

1. Shut down all the computers that are attached to the unit. If there are stations cascaded down from it, all the cascaded stations and the computers attached to them must be shut down, as well.

Note: 1. You must unplug the power cords of any computers that have the *Keyboard Power On* function that are connected to the shut down switches. Otherwise, the switches will still receive power from the computers.

2. If the unit is operating under external power, unplug the power adapter cable.
2. Wait 10 seconds, then plug the stations back in, starting with the lowest stations in the chain and working back to the station you originally shut down.
3. After all the KH88's are up, power On the computers, starting with the ones attached to the lowest stations in the chain and working back to the station you originally shut down.

Port ID Numbering

Each CPU Port on a KH88 installation is assigned a unique *Port ID*. You can directly access any computer on any level of the installation by specifying the Port ID of the CPU port that the computer is connected to - either with the Hotkey port selection method, or with the OSD.

The Port ID is a one, two, or three digit number. It is determined by the Stage Level and CPU Port number of the KH88 unit that a computer is connected to.

The first digit represents the CPU Port number of the First Stage unit; the second digit represents the CPU Port number of the Second Stage unit; the third digit represents the CPU Port number of the Third Stage unit.

- ◆ A computer attached to a First Stage unit has a one digit Port ID (from 1 - 8), that corresponds to the CPU Port number that the computer is connected to.
- ◆ A computer attached to a Second Stage unit has a two digit Port ID.

The first digit represents the CPU Port number on the First Stage unit that the Second Stage unit links back to; the second digit represents the CPU Port number on the Second Stage unit that the computer is connected to.

For example, a Port ID of **2 3** refers to a computer that is connected to CPU Port 3 of a Second Stage unit that links back to CPU Port 2 of the First Stage unit.

- ◆ Likewise, a computer attached to a Third Stage unit has a three digit Port ID. A Port ID of **2 4 1** refers to a computer that is connected to CPU Port 1 of a Third Stage unit, that links back to CPU Port 4 of a Second Stage unit, which, in turn, links back to CPU Port 2 of the First Stage unit.

Port Selection

The KH88 provides three methods to obtain instant access to any computer on your installation: Manual, OSD, and Hotkey.

Manual:

Simply press the appropriate *Port Selection Switch* on the unit's front panel. After you press the switch, the *Selected* LED lights to indicate that the port has the KVM focus. The OSD (see p. 17) automatically switches to highlight the computer that you have selected.

- Note:** 1. On a cascaded installation, you must press the Port Selection switch on the KH88 Station that connects directly to the computer you want to access.
2. Simultaneously pressing Port Selection buttons 7 and 8 on the First Stage unit initiates the *Auto Scan* feature (see *F7 SCAN*, p. 27), in which all the ports currently selected for *Quick View* scanning (see *Set Quick View Ports*, p. 26), are cycled through. The length of time spent on each port is determined with the *Scan Duration* setting under the OSD's **F3 SET** function (see p. 23).

OSD:

OSD (On Screen Display), provides a menu driven interface to handle the computer switching procedure to provide instant access to any computer on the installation. OSD operation is discussed in detail beginning on p. 17.

Hotkey:

Hotkeys allow you to conveniently provide KVM focus to a particular computer from the keyboard, instead of having to manually select them by pressing Port Selection switches. Hotkey operation is discussed in detail beginning on p. 29.

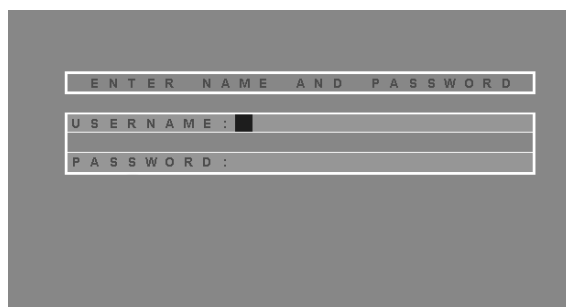
Chapter 3.

OSD Operation

OSD Overview

The On Screen Display (OSD) provides a visual, menu-driven, mouse enabled, interface that offers quick and convenient computer access and control, as well as efficient system administration including user management (access rights, passwords, etc.).

Each OSD menu option activates a function that configures and controls the operation of the KVM installation. All procedures start from the OSD Main Screen. To bring up the OSD Main Screen, tap the **Scroll Lock** key twice. The login dialog box appears:



ENTER NAME AND PASSWORD

USERNAME : ■

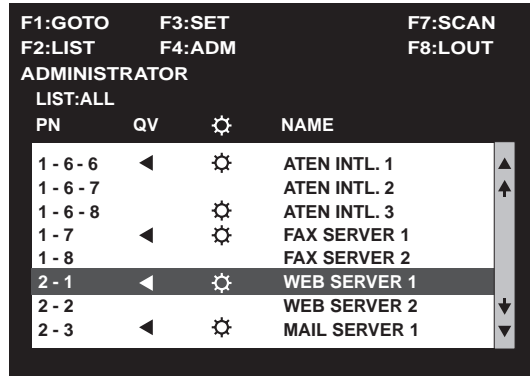
PASSWORD : ■

- Note:** 1. [Scroll Lock] is the default OSD hotkey. You can optionally change the Hotkey to the Ctrl key (see *OSD Hotkey*, p. 22, for details).
2. The screenshots in this chapter are for example purposes. The screens that you see may vary slightly as to their wording and appearance.

Key in a valid username and password, then press **[Enter]**.

Note: If this is the first time that the OSD is being run, or if the password function has not been set, simply press **[Enter]**. The OSD Main Screen comes up in Administrator Mode. In this mode, you have access to all Administrator and User functions, and can set up operations (including password authorization for the future), as you would like.

After you log in, a screen similar to the one below appears:




The screenshot shows a terminal window with the following content:

```
F1:GOTO      F3:SET      F7:SCAN
F2:LIST      F4:ADM      F8:LOUT
ADMINISTRATOR
LIST:ALL
PN          QV          ⚙          NAME
1 - 6 - 6  ◀          ⚙          ATEN INTL. 1
1 - 6 - 7                                     ATEN INTL. 2
1 - 6 - 8  ◀          ⚙          ATEN INTL. 3
1 - 7      ◀          ⚙          FAX SERVER 1
1 - 8                                     FAX SERVER 2
2 - 1      ◀          ⚙          WEB SERVER 1
2 - 2      ◀          ⚙          WEB SERVER 2
2 - 3      ◀          ⚙          MAIL SERVER 1
```

- Note:** 1. The diagram depicts the Administrator's Main Screen. The User Main Screen does not show the **F4** function, since it is reserved for the Administrator and can't be accessed by ordinary Users.
2. The OSD always starts in List view, with the highlight bar at the same position it was in the last time it was closed.
 3. Only the ports that have been set accessible by the Administrator for the currently logged in User are visible (see *SET ACCESSIBLE PORTS*, p. 26, for details).

OSD Main Screen Headings

Heading	Explanation
PN	This column lists the Port ID numbers (see <i>Port ID Numbering</i> , p. 15), for all the CPU ports on the installation. The simplest method to access a particular computer is move the Highlight Bar to it, then press [Enter].
QV	If a port has selected for Quick View scanning (see <i>Set Quick View Ports</i> , p. 26), an arrowhead symbol displays in this column to indicate so.
	The computers that are powered on and are On Line have a Sun symbol in this column to indicate so.
NAME	If a port has been given a name (see <i>Edit Port Names</i> , p. 25), its name appears in this column.

OSD Navigation

Use the following procedures to navigate through OSD menus:

- ◆ To move up or down through the list one line at a time, Click the Up and Down Triangle symbols (▲) or use the Up and Down Arrow Keys. If there are more list entries than there is room for on the Main Screen, the screen will scroll.
- ◆ To move up or down through the list one screen at a time, Click the Up and Down Arrow symbols (▲▼), or use the [Pg Up] and [Pg Dn] keys. If there are more list entries than there is room for on the Main Screen, the screen will scroll.
- ◆ To activate a port, Double Click it, or move the Highlight Bar to it then press [Enter].
- ◆ After executing any action, you automatically go back to the menu one level above.
- ◆ To dismiss the current menu, and return to the previous one, press [Esc].
- ◆ To dismiss the Main Screen, and deactivate the OSD (but not log out), press [Esc].
- ◆ To Logout, Click **F8** at the top of the Main Screen, or press [F8].

OSD Functions

OSD functions configure and control the OSD. Examples of what can be accomplished with the OSD include: rapidly switching to any port; auto scanning specifically selected ports; limiting the list of ports you wish to view; designating a port as a Quick View Port; managing port names; user management, system administration, and making OSD setting adjustments.

To access an OSD function:

1. Either Click a Function Key field at the top of the Main Screen, or press a Function Key on the keyboard.
2. In the Submenus that appear make your choice either by Double Clicking it, or moving the Highlight Bar to it, then pressing **[Enter]**.
3. Press **[Esc]** to return to the previous menu level.

A complete description of the KH88's OSD operations are given in the sections that follow.

F1 GOTO:

GOTO allows you to switch directly to a port either by keying in the port's *Name*, or its *Port ID*.

- ♦ To use the Name method, key in **1**; key in the port's Name; then press **[Enter]**.
- ♦ To use the Port ID method, key in **2**; key in the *Port ID*; then press **[Enter]**.

Note: You can key in a partial Name or Port ID. In that case, the screen will show all the computers that the User has *View* rights to (see *SET ACCESSIBLE PORTS*, p. 26), that match the Name or Port ID pattern, regardless of the current List settings (see *F2 LIST*, p. 21, for details).

To return to the OSD Main Screen without making a choice, press **[Esc]**.

F2 LIST:

Many of the OSD functions only operate on the computers that have been selected for Listing (displaying) on the Main Screen. This function lets you broaden or narrow the scope of which ports are selected for Listing. The submenu choices and their meanings are given in the table below:

Choice	Meaning
ALL	Lists all of the ports on the installation.
QUICK VIEW*	Lists only the ports that have been selected as Quick View Ports (see p. 26).
POWERED ON	Lists only the ports that have their attached computers Powered On.
QUICK VIEW + POWERED ON*	Lists only the ports that have been selected as Quick View Ports (see p. 26), and that have their attached computers Powered On.

* Only the Administrator has the rights to designate which ports are *Quick View* ports (see p. 26, for details).

To select ports for the LIST:

1. Move the Highlight Bar to the choice you want, then press [Enter]. An icon appears before the choice to indicate that it is the currently selected one.
2. After you make your choice and press [Enter], you return to the OSD Main Screen with the newly formulated List displayed.

F3 SET:

This function allows each operator to set up his own working environment. A separate profile for each is stored by the OSD and is activated according to the *Username* that was provided during Login.

To change a setting:

1. Double Click it; or move the highlight bar to it, then press **[Enter]**.
2. After you select an item, a submenu with further choices appears. To make a selection, either Double Click it; or move the Highlight Bar to it, then press **[Enter]**. An icon appears before the selected choice to indicate which one it is.

Note: All your setting changes are stored in temporary memory and remain in effect for the duration of your session. The changes only become permanent when you Log out of the OSD (see p. 28). If you shut down the KH88 without first logging out, your changes are discarded.

The settings are explained in the following table:

Setting	Function
OSD HOTKEY	Selects which Hotkey activates the OSD function: [Scroll Lock] [Scroll Lock] or [Ctrl] [Ctrl] . Since the Ctrl key combination may conflict with programs running on the computers, the default is the Scroll Lock combination.
PORT ID DISPLAY POSITION	Allows you to position where the Port ID appears on the monitor. The default is the upper left corner, but you can have it appear anywhere on the screen. Use the Mouse or the Arrow Keys plus Pg Up, Pg Dn, Home, End, and 5 (on the numeric keypad with Num Lock off), to position the Port ID display, then Double Click or press [Enter] to lock the position and return to the Set submenu.

(Table continues on next page)

(F3 SET: continued)

Setting	Function
PORT ID DISPLAY DURATION	Determines how long a Port ID displays on the monitor after a port change has taken place. The choices are: User Defined - which lets you select the amount of time (from 1 - 255 sec.); and Always On - which displays the Port ID at all times. If you select <i>User Defined</i> , key in the number of seconds, then press [Enter] . The default is 3 Seconds. A setting of 0 (zero) disables this function.
PORT ID DISPLAY MODE	Selects how the Port ID is displayed: the Port Number alone (PORT NUMBER); the Port Name alone (PORT NAME); or the Port Number plus the Port Name (PORT NUMBER + PORT NAME). The default is PORT NUMBER + PORT NAME).
SCAN DURATION	Determines how long the focus dwells on each port as it cycles through the selected ports in Auto Scan Mode (see <i>F7 SCAN</i> , p. 27). Key in a value from 1 - 255 seconds, then press [Enter] . Default is 5 seconds; a setting of 0 disables the Scan function.
SCAN/SKIP MODE	Selects which computers will be accessed under Auto Scan Mode (see <i>F7 SCAN</i> , p. 27). Choices are: ALL - All the Ports which have been set Accessible (see <i>SET ACCESSIBLE PORTS</i> , p. 26); POWERED ON - Only those Ports which have been set Accessible and are Powered On; QUICK VIEW - Only those Ports which have been set Accessible and have been selected as Quick View Ports (see <i>SET QUICK VIEW PORTS</i> , p. 26); QUICK VIEW + POWERED ON - Only those Ports which have been set Accessible and have been selected as Quick View Ports and are Powered On. The default is ALL. Note: The Quick View choices only show up on an Administrator's screen, since only he has <i>Quick View</i> setting rights (see <i>SET QUICK VIEW PORTS</i> , p. 26, for details).
SCREEN BLANKER	If there is no input from the console for the amount of time set with this function, the screen is blanked. Key in a value from 1 - 30 minutes, then press [Enter] . A setting of 0 disables this function. The default is 0 (disabled).
HOTKEY COMMAND MODE	Enables / Disables the Hotkey function (see p. 29) in case a conflict with programs running on the computers occurs. The default is enabled.

F4 ADM:

F4 is an Administrator only function. It allows the Administrator to configure and control the overall operation of the OSD. To change a setting use the Up and Down Arrow Keys to move the highlight bar to it then press **[Enter]**.

After you select an item, a submenu with further choices appears. Double Click the choice you want, or move the Highlight Bar to it then press **[Enter]**. An icon appears before the selected choice to indicate which one it is. The settings are explained in the following table:

Note: All your setting changes are stored in temporary memory and remain in effect for the duration of your session. The changes only become permanent when you Log out of the OSD (see p. 28). If you shut down the KH88 without first logging out, your changes are discarded.

Setting	Function
SET USERNAME AND PASSWORD	<p>This function is used to set Usernames and Passwords:</p> <ol style="list-style-type: none">1. Usernames and Passwords for one Administrator and four Users can be set.2. After you select one of the User fields or the Administrator field, a screen that allows you to key in a Username and Password appears. The password may be up to 15 characters long, and can consist of any combination of letters and numbers (A - Z, 0 - 9).3. For each individual, key in the Username and Password, then press [Enter].4. To modify or delete a previous Username and/or Password, use the backspace key to erase individual letters or numbers. <p>Note: To clear all Username and Password information and have the Switch return to its default (empty) state, see <i>Clear Login Information</i>, p. 47.</p>
SET LOGOUT TIMEOUT	<p>If there is no input from the console for the amount of time set with this function, the Operator is automatically logged out. A login is necessary before the console can be used again.</p> <p>This enables other Operators to gain access to the computers when the original Operator is no longer accessing them, but has forgotten to log out. To set the timeout value, key in a number from 1 - 180 minutes, then press [Enter]. If the number is 0 [zero], this function is disabled. The default is 0 (disabled).</p>

(Table continues on next page)

(F4 ADM: continued)

Setting	Function
EDIT PORT NAMES	<p>To help remember which computer is attached to a particular port, every port can be given a name. This function allows the Administrator to create, modify, or delete port names. To Edit a port name:</p> <p>Note: Only the Ports currently chosen for the LIST view on the main OSD screen (see <i>F2 LIST</i>, p. 21), show up here.</p> <ol style="list-style-type: none">1. Click the port you want, or use the Navigation Keys to move the highlight bar to it, then press [Enter].2. Key in the new Port Name, or modify/delete the old one. The maximum number of characters allowed for the Port Name is 15. Legal characters include:<ul style="list-style-type: none">♦ All alpha characters: a - z; A - Z♦ All numeric characters: 0 - 9♦ + - / : . and SpaceCase does not matter; the OSD displays the Port Name in all capitals no matter how they were keyed in.3. When you have finished editing, press [Enter] to have the change take effect. To abort the change, press [Esc].
RESTORE DEFAULT VALUES	<p>This function is used to undo all changes and return the setup to the original factory default settings (see <i>FACTORY DEFAULT SETTINGS</i>, p. 45) - except for the <i>Names</i> settings that were assigned to the Ports, which are saved.</p>
CLEAR THE NAME LIST	<p>This function is similar to Restore Default Values. The difference is that it also clears the <i>Names</i> settings along with undoing all changes and returning the setup to the original factory default settings.</p>
ACTIVATE BEEPER	<p>Choices are Y (for Yes), or N (for No). When activated, the beeper sounds whenever a Port is changed; when activating the Auto Scan function (see <i>F7 SCAN</i>, p. 27); or an invalid entry is made on an OSD menu. The default is Y (activated).</p>

(Table continues on next page)

(F4 ADM: continued)

Setting	Function
SET QUICK VIEW PORTS	<p>This function lets the Administrator select which Ports to include as Quick View ports.</p> <p>Note: Only the Ports currently chosen for the LIST view on the main OSD screen (see p. 21), show up here.</p> <ul style="list-style-type: none">• To select/deselect a port as a Quick View Port, Double Click the port you want, or use the Navigation Keys to move the highlight bar to it, then press [Enter].• When a port has been selected as a Quick View Port, an arrowhead displays in the QV column of the LIST on the Main Screen to indicate so. When a port is deselected, the arrowhead disappears.• If one of the Quick View options is chosen for the LIST view (see <i>F2 LIST</i>, p. 21), only a Port that has been selected here will display on the List.• If one of the Quick View options is chosen for Auto Scanning (see <i>SCAN/SKIP MODE</i>, p. 23), only a Port that has been selected here will be Auto Scanned. <p>The default is for no ports to be selected.</p>
SET ACCESSIBLE PORTS	<p>This function allows the Administrator to define Operator access to the computers on the installation on a Port-by-Port basis.</p> <p>For each Operator, select the target Port; then press the [Spacebar] to cycle through the choices: F (Full access), V (View Only), or blank (No access). Repeat until all access rights have been set, then press [Enter]. The default is F for all users on all Ports.</p> <p>Note: A blank setting means that no access rights are granted. The Port will not show up on the User's LIST on the Main Screen.</p>
FIRMWARE UPGRADE	<p>In order to upgrade the KH88's firmware (see Chapter 5), you must first invoke Firmware Upgrade Mode with this setting. Only the Super Administrator on the Master Station can utilize this function.</p>
SET PS/2 CLK DELAY MODE	<p>Use this setting to adjust the PS/2 clock timing. Press the [Spacebar] to cycle through the choices (0, 1, 2). The default is 0 (zero).</p> <p>Note: You should only change this setting from the default of 0 if you encounter keyboard or mouse input problems due to a PS/2 clock delay problem.</p>

F7 SCAN:

This function allows you to automatically switch among the available computers at regular intervals so that you can monitor their activity without having to take the trouble of switching yourself.

- ◆ The selection of computers to be included for Auto Scanning is made with the *Scan/Skip Mode* setting under the **F3 SET** function (see p. 23).
- ◆ The amount of time that each Port displays for is set with the *Scan Duration* setting under the **F3 SET** function (see p. 23). When you want to stop at a particular location, press the **[Spacebar]** or **[Esc]** to stop scanning and exit *Auto Scan Mode*.
- ◆ If the scanning stops on an empty port, or one where the computer is attached but is powered Off, the monitor screen will be blank, and the mouse and keyboard will have no effect. Simply wait - after the *Scan Duration* time is up, the Scan function will move on to the next port.
- ◆ As each computer is accessed, an **S** appears in front of the Port ID display to indicate that it is being accessed under *Auto Scan Mode*.
- ◆ While Auto Scan Mode is in effect, the console will not function normally. You must exit Auto Scan Mode in order to regain control of the console.
- ◆ While you are in Auto Scan Mode, you can pause the scanning in order to keep the focus on a particular computer either by pressing **P**, or with a Left Click of the mouse. See *Starting Auto Scan*, p. 32, for details.
- ◆ To exit Auto Scan Mode, press the **[Spacebar]** or **[Esc]**.



F8 LOUT:

LOUT (Log Out) logs you out of OSD control of the computers, and blanks the Console screen. This is different from simply pressing **[Esc]** to deactivate the OSD when you are at the Main Screen. With this function you must log in all over again to regain access to the OSD, whereas with **[Esc]**, all you have to do to reenter the OSD is tap the OSD Hotkey.

- Note:**
1. When you reenter the OSD after logging out, the screen stays blank except for the OSD Main Screen. You must input your password before you can continue.
 2. If you reenter the OSD after logging out, and immediately use **[Esc]** to deactivate the OSD without having selected a port from the OSD menu, a Null Port message displays on the screen. The OSD Hotkey will bring up the Main OSD Screen.

Chapter 4.

Hotkey Operation

Hotkey Port Control

Hotkey Port Control allows you to provide KVM focus to a particular computer directly from the keyboard. The KH88 provides the following features:

- ◆ Selecting the Active Port
- ◆ Auto Scanning
- ◆ Skip Mode Switching

Invoking Hotkey Mode

All Hotkey operations begin by invoking *Hotkey Mode*. Invoking Hotkey Mode is a three step procedure:

1. Press and hold down the **Num Lock** key
2. Tap the **asterisk** key or the **minus** key
3. Release the **Num Lock** key:

[Num Lock] + [*] ;

Or:

[Num Lock] + [-] ;

When HKM is active:

- ◆ A Command Line appears on the monitor screen. The command line prompt is the word *Hotkey*: in yellow text on a blue background. Hotkey information that you key in displays on the command line.
- ◆ Ordinary keyboard and mouse functions are suspended - only Hotkey compliant keystrokes and mouse clicks (described in the sections that follow), can be input.
- ◆ Pressing [Esc] or [Spacebar] exits HKM.

Selecting the Active Port

Each CPU port is assigned a Port ID (see *Port ID Numbering*, p. 15). You can directly access any computer on the installation with a Hotkey combination that specifies the Port ID of the CPU Port that the computer is connected to. The steps involved are:

1. Invoke HKM (see p. 29)

2. Key in the Port ID

The Port ID numbers display on the Command Line as you key them in. If you make a mistake, use [Backspace] to erase the wrong number.

3. Press [Enter]

After you press [Enter], the KVM focus switches to the designated computer and you automatically exit HKM.

Port Key In Examples:

- ◆ To access a computer attached to Port 3 of a Single Stage installation, key in **3** for the Port ID, as follows:

```
[Numlock] + [*] 3 [Enter]
```

- ◆ To access a computer attached to Port 3 of a Second Stage unit that is cascaded down from Port 2 of the First Stage unit, key in **23** for the Port ID, as follows:

```
[Numlock] + [*] 2 3 [Enter]
```

Note: You must key in the numbers one at a time.

- ◆ To access a computer attached to Port 8 of a Third Stage unit that links back to Port 4 of a Second Stage unit, which, in turn, links back to CPU Port 6 of the First Stage unit key in **648** for the Port ID, as follows:

```
[Numlock] + [*] 6 4 8 [Enter]
```

Auto Scanning

Auto Scan automatically switches among all the active CPU Ports that are accessible to the currently logged on User at regular intervals (see *Scan Mode* of the OSD **F3 SET** function, p. 23), so that he can monitor their activity automatically.

Setting the Scan Interval:

The amount of time Auto Scan dwells on each port is set with the *Scan Duration* setting of the OSD **F3 SET** function (see p. 23). You can change the scan interval before activating Hotkey Auto Scanning, if you wish, with the following Hotkey combination:

1. Invoke HKM (see p. 29)

2. Key in [T] [n]

Where [T] is the letter **T**, and [n] is a number from 1-255 that represents the number of seconds for the dwell time.

The letter **T**, and the numbers display on the Command Line as you key them in. If you make a mistake, use [Backspace] to erase the wrong number.

3. Press **[Enter]**

After you press [Enter], you automatically exit Hotkey Mode, and are ready to start Auto Scanning.

Starting Auto Scan:

To start Auto Scanning, key in the following Hotkey combination:

1. Invoke HKM (see p. 29)
2. Key in [A]

After you press **A**, you automatically exit Hotkey Mode, and enter Auto Scan Mode.

3. To exit Auto Scan Mode, press **[Esc]** or **[Spacebar]**

Note: While Auto Scan Mode is in effect, ordinary keyboard and mouse functions are suspended - only Auto Scan Mode compliant keystrokes and mouse clicks can be input. You must exit Auto Scan Mode in order to regain normal control of the console.

While you are in Auto Scan Mode, you can pause the scanning in order to keep the focus on a particular computer by pressing **P**. During the time that Auto Scanning is paused, the Command Line displays: **Auto Scan: Paused.**

Pausing when you want to keep the focus on a particular computer is more convenient than Exiting Auto Scan Mode because when you Resume scanning, you start from where you left off. If, on the other hand, you Exited and restarted, Scanning would start over from the very first computer on the installation.

After pausing, to resume Auto Scanning, press any key. Scanning continues from where it left off.

Skip Mode

This feature allows you to switch between computers in order to monitor them manually. You can dwell on a particular port for as long or as little as you like - as opposed to Auto Scanning, which automatically switches after a fixed interval. To invoke Skip Mode, key in the following Hotkey combination:

1. Invoke HKM (see p. 29)

2. Key in **[Arrow]**

Where [Arrow] refers to the left or right Arrow key. After you press [Arrow], you automatically exit HKM, and enter Previous/Next Mode where you can switch ports as follows:

← Skips from the current port to the first accessible port previous to it.
(See *Scan Mode*, p. 23, for information regarding accessible ports.)

→ Skips from the current port to the next accessible port.

3. To exit Skip Mode, press **[Esc]** or **[Spacebar]**

Note: While Skip Mode is in effect, ordinary keyboard and mouse functions are suspended - only Skip Mode compliant keystrokes can be input. You must exit Skip Mode in order to regain normal control of the console.

Hotkey Beeper Control

The Beeper (see Activate Beeper, p. 25) can be Hotkey toggled On and Off. To toggle the Beeper, key in the following Hotkey combination:

1. Invoke HKM (see p. 29)
2. Key in **[B]**

After you press **[B]**, the Beeper toggles On or Off. The Command Line displays *Beeper On* or *Beeper Off* for one second; then the message disappears and you automatically exit Hotkey Mode.

Hotkey Summary Table

[Num Lock] + [*] or [Num Lock] + [-]	[Port ID] [Enter]	Switches access to the computer that corresponds to that Port ID.
	[T] [n] [Enter]	Sets the Auto Scan interval to n seconds - where n is a number from 1 - 255.
	[A]	Invokes Auto Scan Mode. When Auto Scan Mode is in effect, [P] or Left Click pauses Auto Scanning. When Auto Scanning is paused, pressing Any Key or another Left Click resumes Auto Scanning.
	[←]	Invokes Skip Mode and Skips from the current port to the first accessible port previous to it.
	[→]	Invokes Skip Mode and Skips from the current port to the next accessible port.
	[B]	Toggles the Beeper On or Off.
	[R] [Enter]	Resets the KVM settings back to their defaults.

Chapter 5.

The Firmware Upgrade Utility

Introduction

Purpose

The purpose of the Windows-based Firmware Upgrade Utility (FWUpgrade.exe) is to provide an automated process for make upgrading the KVM switch's firmware as smooth and painless as possible.

The program comes as part of a Firmware Upgrade Package that is specific for each device.

As new firmware revisions become available, new firmware upgrade packages are posted on our web site:

<http://www.altusen.com>

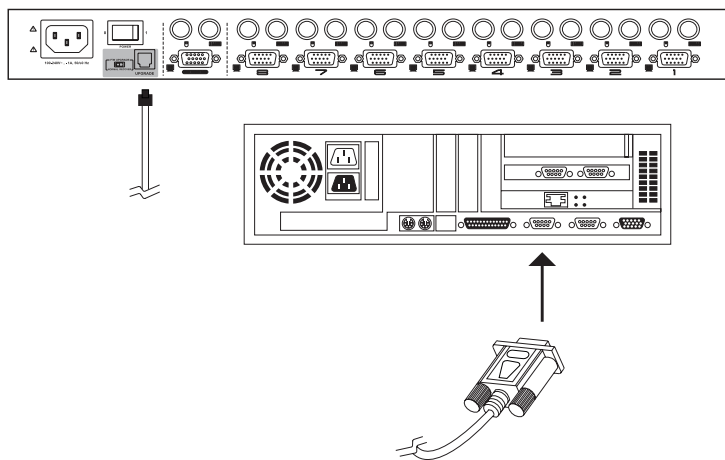
Check the web site regularly to find the latest information and packages.

Note: The screenshots in the descriptions below are for example purposes. The screens that appear during your firmware upgrade may vary somewhat as to their wording and appearance.

Before You Begin

To prepare for the firmware upgrade, do the following:

1. From a computer that is not part of your KVM installation go to our Internet support site and choose the model name that relates to your device (KH88) to get a list of available Firmware Upgrade Packages.
2. Choose the Firmware Upgrade Package you want to install (usually the most recent), and download it to your computer.
3. Use the *Firmware Upgrade Cable* provided with this unit, to connect a COM port on your computer to the *Firmware Upgrade Port* of your switch.



4. Shut down the computers on your KH88 installation.
5. From your KVM switch console, bring up the OSD (see p. 17) and select the **F4 ADM** function.
6. Scroll down to FIRMWARE UPGRADE (see p. 26). Press [Enter], then press [Y] to invoke Firmware Upgrade Mode. For your reference, the current firmware upgrade version displays on the screen.

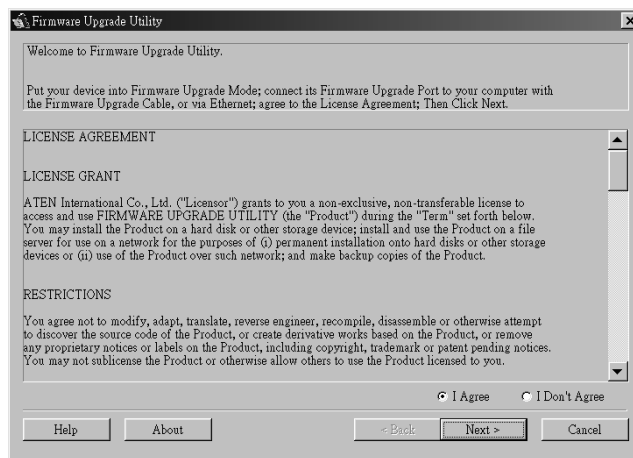
Performing the Upgrade

Starting the Upgrade

To upgrade your firmware:

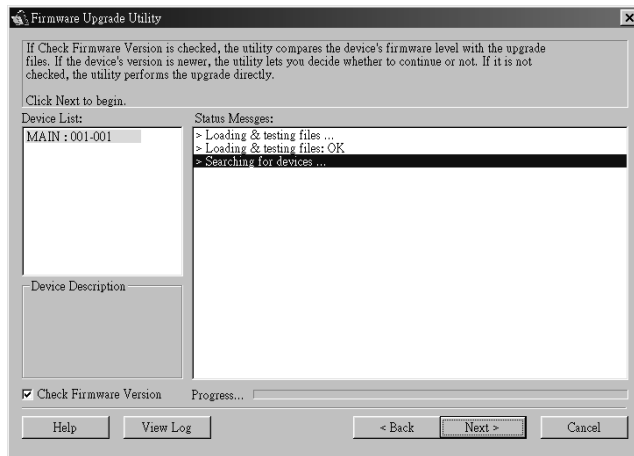
1. Run the downloaded Firmware Upgrade Package file - either by double clicking the file icon, or by opening a command line and keying in the full path to it.

The Firmware Upgrade Utility *Welcome* screen appears:



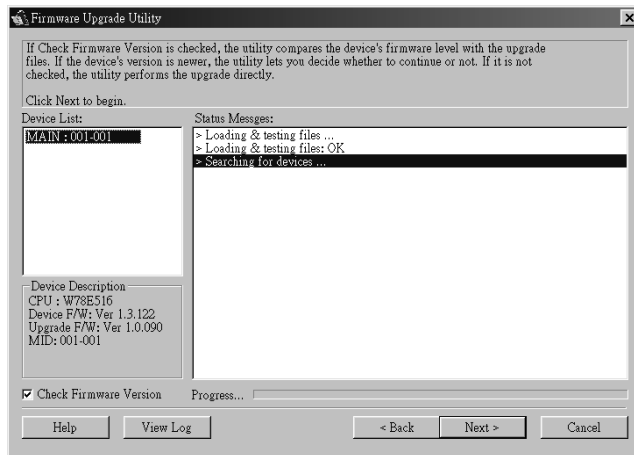
2. Read and *Agree* to the License Agreement (enable the I Agree radio button).

3. Click Next to continue. The Firmware Upgrade Utility main screen appears:



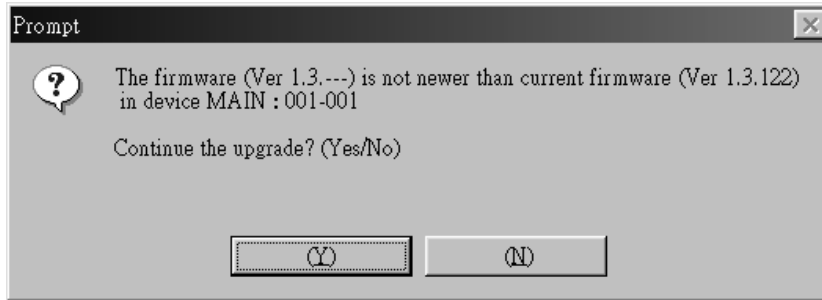
The Utility inspects your installation. The devices capable of being upgraded by the package are listed in the *Device List* panel.

4. As you select a device in the list, its description appears in the *Device Description* panel.



5. After you have made your device selection(s), Click **Next** to perform the upgrade.

If you enabled *Check Firmware Version*, the Utility compares the device's firmware level with that of the upgrade files. If it finds that the device's version is higher than the upgrade version, it brings up a dialog box informing you of the situation and gives you the option to Continue or Cancel.

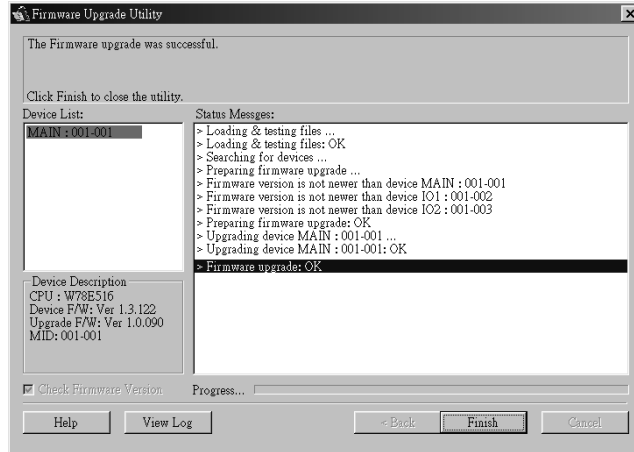


If you didn't enable *Check Firmware Version*, the Utility installs the upgrade files without checking whether they are a higher level, or not.

As the Upgrade proceeds status messages appear in the Status Messages panel, and the progress toward completion is shown on the *Progress* bar.

Upgrade Succeeded

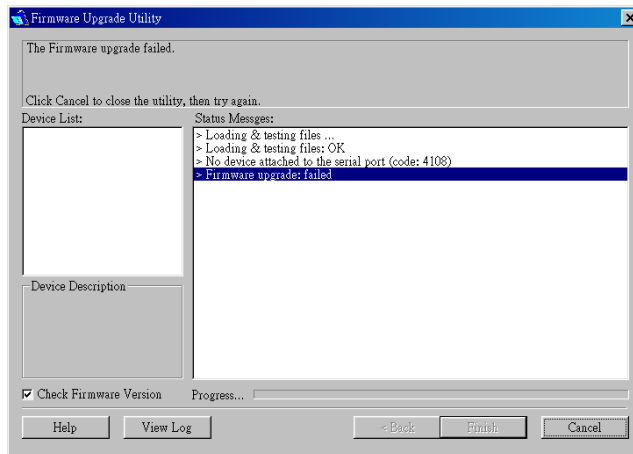
After the upgrade has completed, a screen appears to inform you that the procedure was successful:



Click **Finish** to close the Firmware Upgrade Utility.

Upgrade Failed

If the upgrade failed to complete successfully a dialog box appears asking if you want to retry. Click **Yes** to retry. If you Click **No**, the *Upgrade Failed* screen appears:



Click **Cancel** to close the Firmware Upgrade Utility. See the next section, *Firmware Upgrade Recovery*, for how to proceed.

Firmware Upgrade Recovery

There are basically two conditions that call for firmware upgrade recovery:

- ◆ When you begin a firmware upgrade, but decide not to proceed with it.
- ◆ When the Mainboard firmware upgrade fails.

Note: If one of the cascaded switches fails to upgrade successfully, unplug it from the installation and perform the recovery and upgrade operation independently. After it has been successfully upgraded, plug it back into the installation.

To perform a firmware upgrade recovery, do the following:

1. Power off the switch.
2. Slide the *Firmware Upgrade Recovery Switch* (see p. 7) to the **Recover** position.
3. Use the Firmware Upgrade Cable (provided with this unit), to connect a COM port on your computer with the Firmware Upgrade Port of the switch.
4. Power the switch back on.
5. Follow the upgrade procedures that begin with the *Starting the Upgrade* section (p. 37).
6. After the upgrade completes successfully, power the switch off, once again.
7. Slide the *Firmware Upgrade Recovery Switch* back to the **Normal** position.
8. Power the switch back on.

This completes the Firmware Upgrade Recovery operation, and your switch is ready for use.

Appendix

Computer Connection Table

The following table indicates the relationship between the number of KH88 Units and the number of computers that they control:

Units	Computers	Units	Computers	Units	Computers	Units	Computers
1	8	20	134 - 141	39	267 - 274	58	400 - 407
2	8-15	21	141 - 148	40	274 - 281	59	407 - 414
3	15 - 22	22	148 - 155	41	281 - 288	60	414 - 421
4	22 - 29	23	155 - 162	42	288 - 295	61	421 - 428
5	29 - 36	24	162 - 169	43	295 - 302	62	428 - 435
6	36 - 43	25	169 - 176	44	302 - 309	63	435 - 442
7	43 - 50	26	176 - 183	45	309 - 316	64	442 - 449
8	50 - 57	27	183 - 190	46	316 - 323	65	449 - 456
9	57 - 64	28	190 - 197	47	323 - 330	66	456 - 463
10	64 - 71	29	197 - 204	48	330 - 337	67	463 - 470
11	71 - 78	30	204 - 211	49	337 - 344	68	470 - 477
12	78 - 85	31	211 - 218	50	344 - 351	69	477 - 484
13	85 - 92	32	218 - 225	51	351 - 358	70	484 - 491
14	92 - 99	33	225 - 232	52	358 - 365	71	491 - 498
15	99 - 106	34	232 - 239	53	365 - 372	72	498 - 505
16	106 - 113	35	239 - 246	54	372 - 379	73	505 - 512
17	113 - 120	36	246 - 253	55	379 - 386		
18	120 - 127	37	253 - 260	56	386 - 393		
19	127 - 134	38	260 - 267	57	393 - 400		

Specifications

Function		Specification
Computer Connections	Direct	8
	Max	512 (via Cascade)
Port Selection		Front Panel Switches On Screen Display (OSD) Hotkeys
LEDs	Power	1 (Blue)
	On Line Port	8 (Green)
	Selected Port	8 (Orange)
Connectors	Keyboard	1 x 6 pin mini-DIN female - Console 8 x 6 pin mini-DIN female - CPU Ports
	Mouse	1 x 6 pin mini-DIN female - Console 8 x 6 pin mini-DIN female - CPU Ports
	Video	1 x HDB-15 female - Console 8 x HDB-15 male - CPU Ports
Scan Interval (OSD Select)		1 - 255 secs. (def. 5 secs.)
Power Consumption		100 - 240V AC; 50 - 60 Hz
Operating Temperature		0 - 50° C
Storage Temperature		-20 - 60° C
Humidity		0 - 80% RH; Noncondensing
Housing		Metal
Weight		3.7 kg
Dimensions (L x W x H)		43.3 x 21.6 x 4.4 cm (1U)

OSD Factory Default Settings

The factory default settings are as follows:

Setting	Default
OSD Hotkey	[Scroll Lock] [Scroll Lock]
Port ID Display Position	Upper Left Corner
Port ID Display Duration	3 Seconds
Port ID Display Mode	The Port Number plus the Port Name
Scan Duration	5 Seconds
Scan Mode	All
Screen Blanker	0 (Off)
Logout Timeout	0 (Off)
Beeper	Y (Activated)
Accessible Ports	F (Full) For all Users on all Ports

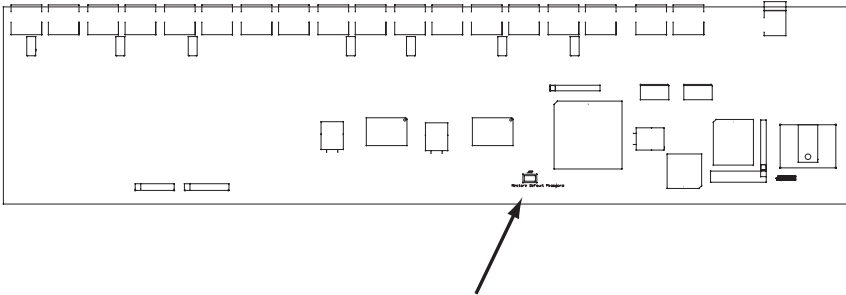
Troubleshooting

Symptom	Possible Cause	Action
Pressing the Hotkeys gets no response.	The connection from the selected port to the target computer has been broken, or the computer is turned OFF.	Check the Online LED for the selected port. If it is not lit: <ol style="list-style-type: none">1. Manually press one of the Select switches to connect to a computer that is powered ON.2. Check the cables to make sure they are all properly connected.
	Improper keyboard reset.	<ol style="list-style-type: none">1. Reset the keyboard (and mouse) by simultaneously pressing Buttons 1 and 2 on the First Stage unit for 3 seconds.2. Unplug the keyboard connector from the Console Keyboard Port, then plug it back in.
	Improper KH88 reset.	Turn off all KH88 units and wait five seconds before turning them back on. See <i>Powering Off and Restarting</i> , p. 14, for details.
	Incorrectly keying in the Port ID.	After invoking the Hotkey function with the [Numlock /] combination, be sure to key in the Port ID and press [Enter] within one second for each key.
Mouse is not responding.	Improper mouse reset.	<ol style="list-style-type: none">1. Reset the mouse (and keyboard) by simultaneously pressing Buttons 1 and 2 on the First Stage unit for 3 seconds.2. Unplug the mouse connector from the Console Mouse Port, then plug it back in.
	PS/2 clock delay problem.	In the OSD, set the PS/2 Clock Delay setting to 1 or 2. See <i>SET PS/2 CLK DELAY MODE</i> , p. 26, for details)

Clear Login Information

If you are unable to perform an Administrator login (because the Username and Password information has become corrupted, or you have forgotten it, for example), you can clear the login information with the following procedure:

1. Power off the switch and open the case.
2. Short the jumper J22 (labeled *Restore Default Password*) at the center front of the switch's main board.



3. Power on the switch.

When you power the switch on, the following message appears:

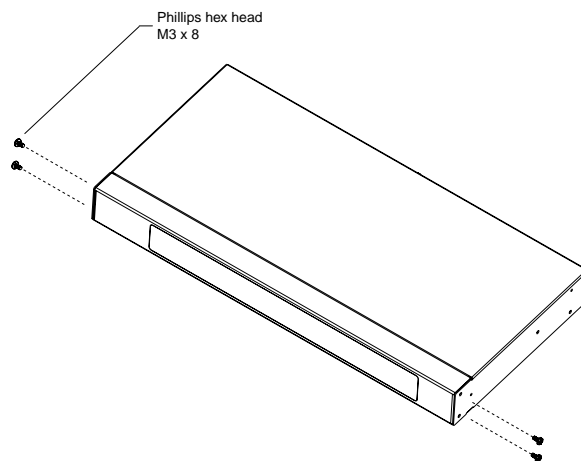
```
USERNAME AND PASSWORD INFORMATION HAS BEEN CLEARED.  
PLEASE POWER OFF THE SWITCH, REMOVE THE JUMPER, CLOSE  
THE CASE, THEN RESTART.
```

After you start back up, the OSD login function acts exactly the way it did the first time the switch was run.

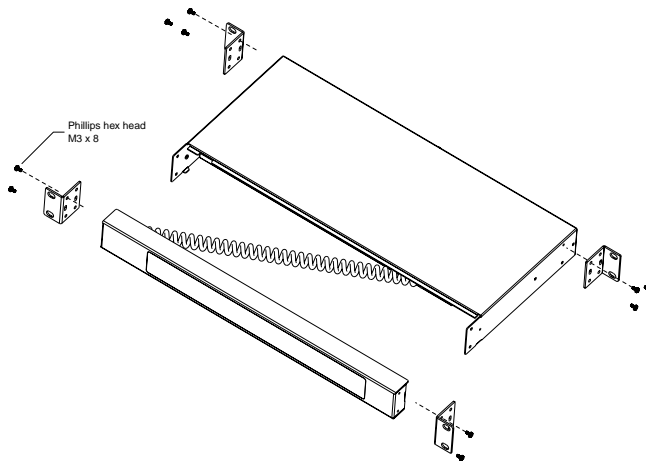
Rack Mounting

To rack mount the unit do the following:

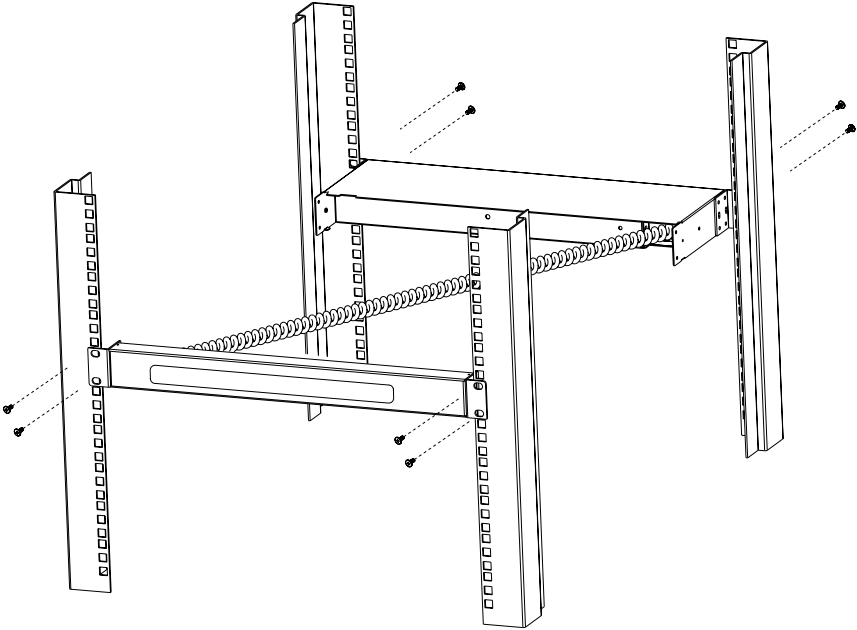
1. Separate the front and rear modules by removing the four module attaching screws:



2. Screw the rack mounting brackets into the front and rear modules:



3. Screw the mounting brackets to the rack.





Limited Warranty

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