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.

Package Contents

The complete KM0432 package consists of the following components:

- 1 KM0432 Modular Matrix™ KVM Switch
- 1 Power Cord
- 1 User Manual
- 1 Quick Start Guide
- 1 Warranty Registration Card

Check to make sure that all of 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 any damage to the switch or to any other devices on the KM0432 installation.

2003-12-15

Contents

Chapter 3
OSD Operation

Chapter 4
Hotkey Operation

Chapter 5
Multiplatform Support

About This Manual

This User Manual provides information on all aspects of installing, configuring and operating your KM0432 Modular Matrix™ KVM switch. An overview of the information found in the manual is provided below.

Overview

Chapter 1, Introduction, introduces you to the KM0432 System. Its purpose, features and benefits are are presented; its front and back panel components are explained; and the modules used to connect to it are described.

Chapter 2, Installation takes you through the KM0432's installation procedres — from a basic single stage hookup to a complete daisy chained plus cascaded installation.

Chapter 3, OSD Operation, provides detailed information for configuring and controlling your installation using the KM0432's intuitive, mouse-driven OSD (On Screen Display) menus.

Chapter 4, Hotkey Operation, explains the concepts and procedures used in controlling the KM0432 from the keyboard.

Chapter 5, Multiplatform Support,

Chapter 6, The Firmware Upgrade Utility, explains how to upgrade the KM0432's firmware with the latest available versions.

Appendix An Appendix at the end of the manual provide technical and other important information regarding the KM0432.

2003-12-15

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: (886-2) 8692-6959.
Email Support	Email your questions and concerns to: support@altusen.com
Online Troubleshooting	The ALTUSEN support website: http://www.altusen.com/support provides online troubeshooting 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 webat 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: 886-2-8692-6959

 Visit ALTUSEN on the web at http://www.altusen.com for a list of locations and telephone numbers

Introduction

The KM0432 Matrix KVM Switch is designed to give IT administrators in large corporations advanced control of multiple servers. It allows operators working at up to four keyboard, mouse, and monitor consoles to simultaneously and independently take direct control of up to 32 computers. With a combination of daisy chaining and cascading, up to 32 operators can access and control up to 4096 computers.

The four consoles belonging to the Master unit (the highest level KM0432) can access all the computers on the installation - those that are directly connected as well as those that are daisy chained and cascaded (up to 4096). The four consoles belonging to each of the Slave units (the daisy chained KM0432s), however, can only access the computers that are connected to them on the same daisy chain level (directly and cascaded - up to 256).

The KM0432 features a Console Module design with automatic console conversion that allows any combination PS/2 and USB consoles to control any combination of PS/2, USB, or Sun computers. The KM0432's RJ-45 CPU connectors, combined with Auto Signal Compensation (ASC), allow signals to travel up to 500 feet (150 meters) away and still maintain high video resolution; eliminating the the need for KVM extenders, and allowing the installation to take advantage of the internal CAT 5e and CAT6 wiring built in to most modern commercial buildings. In addition, use of RJ-45 connectors saves precious IT real estate by allowing a full 32 CPU ports to reside in a single 1U system case.

Setup is fast and easy; plugging cables into their appropriate ports is all that is entailed. Because the KM0432 intercepts keyboard and mouse input directly, there is no software to configure, so there is no need to get involved in complex installation routines or be concerned with incompatibility problems.

Access to any computer is easily accomplished either by entering *Hotkey* combinations from the keyboard, or by means of a powerful menu driven OSD (On Screen Display) system. A convenient *Auto Scan* feature also permits automatic scanning and monitoring of the activities of all computers running on the installation one by one.

Benefits

The KM0432 Matrix KVM switch saves time and money by allowing a single console to manage each of the connected computers. A KM0432 installation provides the following benefits:

◆ Eliminates the cost of a keyboard, monitor, and mouse for each computer.

◆ Eliminates the need for the additional space of the extra components.

◆ Saves on energy costs.

◆ Eliminates the inconvenience, time and effort required to move from one computer to another.

◆ Allows centralized control of computers located at non-contiguous locations on the site.

Features

◆ Four consoles independently and simultaneously control up to 32 directly connected computers

◆ Daisy chain up to 7 additional units

◆ Cascade up to 32 compatible KVM switches from each station on the chain

◆ Up to 32 consoles control up to 4,096 computers on a daisy chained/cascaded installation

◆ Compact design - RJ-45 connectors allow rack mounting in a 19", 1U, system rack

◆ Multiplatform support: PC, Mac and Sun

◆ Console conversion - any type of console can control any type of computer - mixed combinations (PS/2 & USB) supported on both the console and computer sides

◆ PS/2 keyboard and mouse emulation - computers boot even when the console focus is elsewhere - *Keep Alive* feature ensures that the keyboard and mouse work properly even if the switch temporarily loses power

◆ Hot pluggable; add or remove components without having to power off the switch

- No software required; convenient computer selection via intuitive hotkey combinations or On Screen Display (OSD) menus
- OSD port list automatically expands when stations are added - port names are automatically reconfigured when the station sequence is changed
- OSD screen automatically adjusts to resolution changes
- Auto Scan feature for monitoring user-selected computers
- Three level password security: Super Administrator, Administrator, and Users
- LCD, VGA, SVGA, XGA, and MultiSync support; DDC2B
- Superior video quality - up to 1024 x 768 @ 60Hz for up to 150m; 1920 x 1440 at normal cable distances
- Auto Signal Compensation (ASC) assures optimum video resolution for distances up to 150m between the switch and the consoles or computers - no DIP switch setting required
- Lifetime firmware upgrading via flash ROM

Hardware Requirements

Console

The following equipment must be used for each console:

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

Computers

The following equipment must be installed on each computer:

- An HDB-15 video port or, for legacy Sun systems, a Sun 13W3 video port.
- Either a PS/2 style (6 pin mini-DIN) mouse port and PS/2 style keyboard port; or USB ports (for a USB keyboard and USB mouse); or, for legacy Sun systems, a Sun Sun style keyboard port (8 pin mini-DIN).

Cables

The following cables are required for use with the KM4032 Modular Matrix KVM switch:

Function		Cable
Console Module to KM0432		Cat. 5 cable
KM0432 to KVM Adapter Cable (see label *3*, p. 14)		
KVM Adapter Cable (To computer or cascaded KVM switch.)	For PS/2 ports	KA9120
	For USB ports	KA9170
	For Sun Legacy Computers	KA9130
	For Sun USB Computers	KA9131
Daisy Chain Cable		KC1800

KM0432 Front View
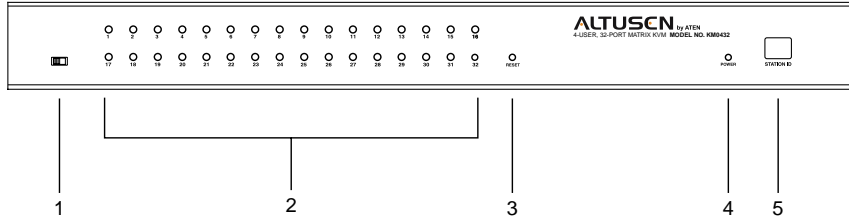
1. **Firmware Upgrade Recovery Switch**

   During normal operation and while performing a fimware upgrade, this switch should be in the NORMAL position. If a firmware upgrade operation does not complete successfully, slide this switch to the RECOVER position and do a warm reset (see p. 6), to return the switch to its prior firmware state.

   After returning the switch to its prior firmware state, slide the switch back to the NORMAL position to attempt the firmware upgrade again, or to use the switch with its prior firmware.

2. **Port LEDs**

   The Port LEDs are multicolored (Red / Green / Amber), and provide status information about their corresponding CPU Ports as follows:

Color	Condition	Indication
Amber	Steady	Port is selected; connected computer is On
	Flashing	Port is selected; port is cascaded to a powered on KVM switch
Red	Steady	Port is selected; connected computer is Off
Green	Steady	Port is not selected; connected computer is On
	Flashing	Port is not selected; port is cascaded to a powered on KVM switch
Off		Port is not selected; connected computer is Off

3. **Reset Switch**

   Pressing this switch in performs a System Reset.

   Note: This switch is semi-recessed and must be pushed with a thin object - such as the end of a paper clip, or a ballpoint pen.

4. **Power LED**

   Lights to indicate that the KM0432 is powered up and ready to go.

5. **Station ID LED**

   The KM0432's Station ID is displayed here. If this is a Single Station installation (see p. 12), or the First Station on a Daisy Chained installation (see p. 17), the KM0432 has a Station ID of **01**.

   On a Daisy Chained installation, the KM0432 auto-senses its position and displays the Station ID that corresponds to its place in the chain. (see *Port ID Numbering*, p. 29 for details).

KM0432 Rear View
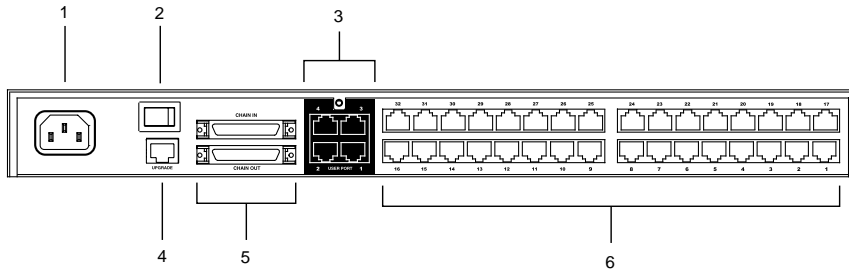
1. **Power Socket**

   The power cord to the AC source plugs in here.

2. **Power Switch**

   This is a standard rocker switch that powers the unit On and Off.

3. **Console Port Section**

   The Cat. 5 cables from the Console Modules (see p. 8) plug in here.

4. **Firmware Upgrade Port**

   The *Firmware Upgrade Cable* that transfers the firmware upgrade data from the administrator's computer to the KM0432 (see p. 60), plugs into this RJ-45 connector.

5. **Daisy Chain Ports**

   When Daisy Chaining Units (see p. 17), the daisy chain cables plug in here.

   The upper port is the *Chain In* port; the lower one one is the *Chain Out* port. The Chain In port is not used on the Master (First Stage) unit.

6. **Computer Port Section**

   The Cat. 5 cables that link the KM0432 to KVM cables that connect to the computers plug in here.

Console Modules

The purpose of the Console Modules is to provide flexibility for your installation by allowing PS/2 and USB interfaces to be mixed and matched at the console side, and PS/2, USB and Sun interfaces to be mixed and matched at the computer side. With this approach, either type of console can access and control any type of computer. The modules currently available are shown in the table below:

Module	Type
KA9220	For PS/2 consoles
KA9270	For all USB consoles (including Mac and Sun)

Console Modules Front View
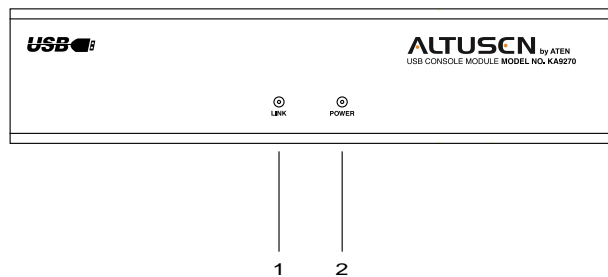
Although, the KA9270 Module is shown in the diagram, the front panel configuration of both modules is the same. It consists of two LEDs: Link and Power.

- **Link** lights to indicate that the module is connected to the KM0432.
- **Power** lights to indicate that the module is turned On and receiving power.

Console Modules Rear View
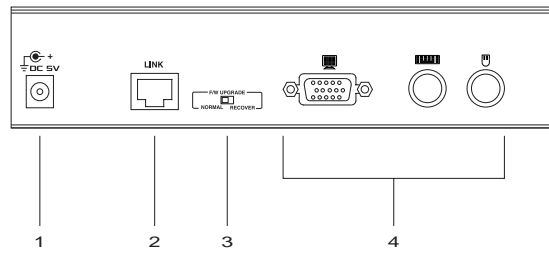
KA9220
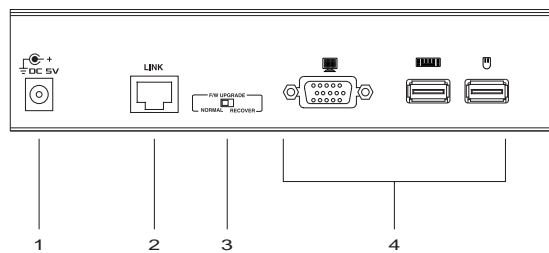
KA9270

1. **Power Jack**

   The power adapter cable plugs in here.

2. **I/O Jack**

   The cable that links the module to the KM0432 plugs in here.

3. **Firmware Upgrade Recovery Switch**

   During normal operation and while performing a fimware upgrade, this switch should be in the NORMAL position.

4. **Console Port Section**

   The cables from your keyboard, monitor and mouse plug in here. The keyboard and mouse ports of both modules are labeled with an appropriate icon to indicate which is which. The KA9220 ports are also color coded.

Notes:

Overview

For convenience and flexibility that allows mixing the PS/2 and USB interfaces, the KM0432's design utilizes *Console Modules* that act as signal translation intermediaries between the consoles and the switch., and *KVM Adapter Cables*, that serve as intermediaries between the switch and the computers:
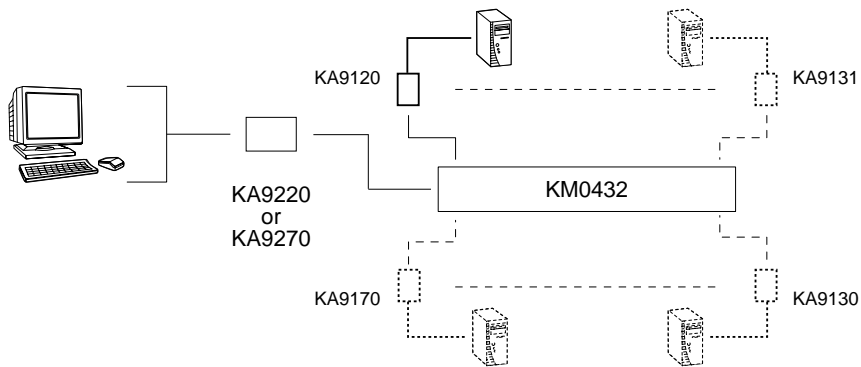
A separate console module is required for each console you connect. Likewise, a separate KVM adapter cable is required for each computer connection. The console module model number for each interface is shown in the table below. The model numbers of the KVM adapter cables are given in the *Cables* section on p. 4.

Interface	Console Model
PS/2	KA9220
USB	KA9270

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 Stage Installation

In a Single Stage installation, there are no additional KVM switches daisy chained or cascaded down from the first unit. To set up a single stage installation, refer to the diagram on p. 14 (the numbers in the diagram correspond with the numbers of the instruction steps), and do the following:

1. Connnect the Console to the Console Module

   Plug your keyboard, mouse, and monitor into their respective ports on the Console Module. Each port is marked with an icon to indicate itself.

   Note: The diagram shows the rear panel of both the KA9220 (PS/2 port) and KA9720 (USB port) modules.

2. Connect the Console Module to the KM0432

   Use Cat. 5 cable to connect the *Link* port of the module to one of the Console ports on the KM0432's rear panel. Up to four consoles can be connected.

   Note: The distance between the Console Module and the KM0432 must not exceed 150m (500').

   (Repeat Steps 1 and 2 for any other consoles you wish to connect.)

3. Connect the KM0432 to the KVM Adapter Cable

   Use Cat. 5 cable to connect any available CPU Port to a KVM adapter cable that is appropriate for the computer you are installing (see the table on p. 4 for details).

   Note: The distance between the KM0432 and the KVM Adapter Cable must not exceed 150m (500').

4. Connect the KVM Adapter Cable to the Computer.

   Plug the connectors on the KVM cable into the appropriate ports of the computer you are installing.

   Note: Repeat steps 3 and 4 for all the computers you wish to connect. Up to 32 computers can be connected in this fashion.

5. After all your computers have been cabled up, plug the female end of the power cord into the KM4032's Power Socket; plug the male end into an AC power source.

6. For each Console Module, plug its power adapter into an AC source; plug the power adapter cable into the unit's power jack.

7. Turn on the power to the KM0432.

8. Turn on the power to the computers.

KA9220

KA9270

ATEN
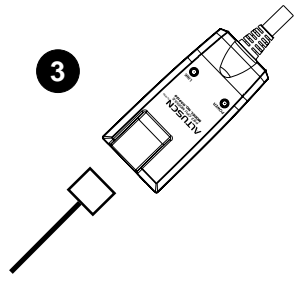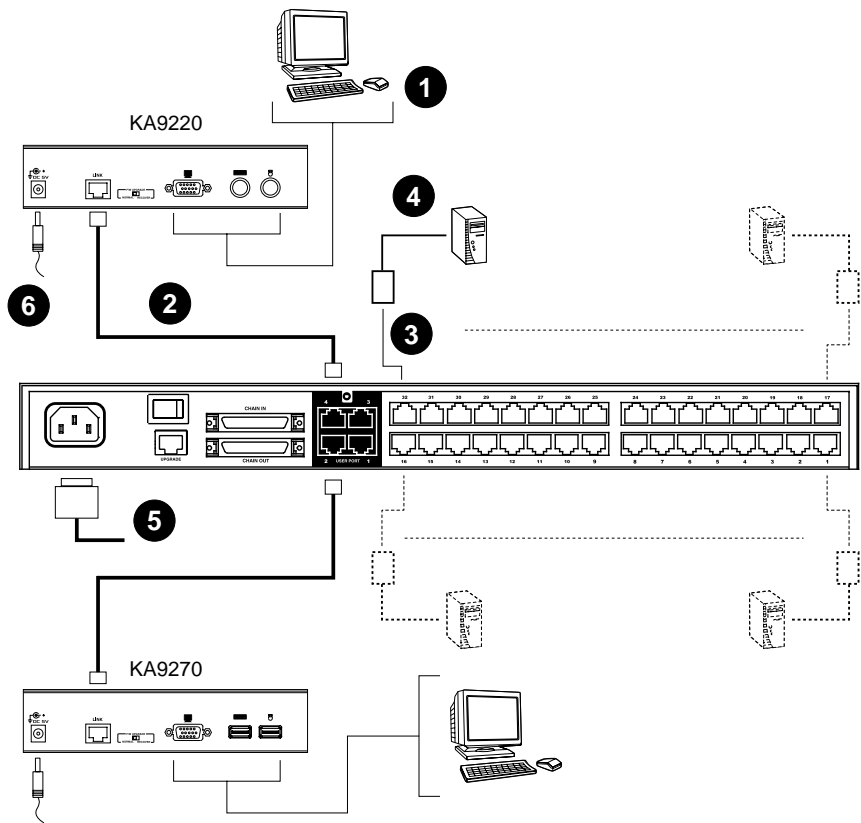
USB Cable Connection:
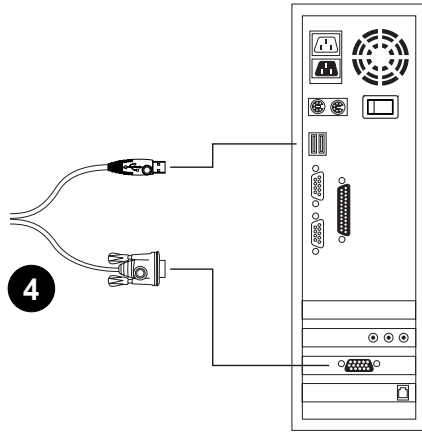
PS/2 Cable Connection:
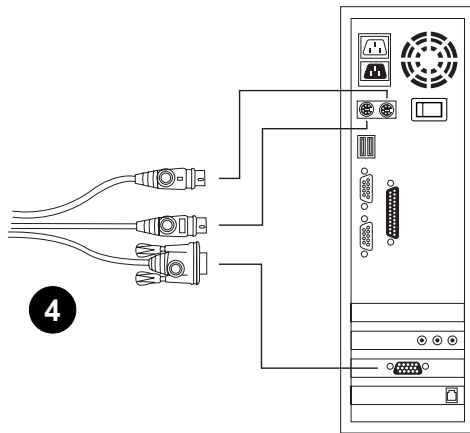
Multilevel Installations

The number of computers that can be added to your installation can be greatly expanded by performing a multilevel installation. The KM0432 supports three types of multilevel installation:

- Daisy chained
- Cascaded
- Daisy chained plus cascaded

Overview

Daisy chaining refers to connecting two KVM switches via dedicated daisy chain ports. The switches are strung together in a chain (see the diagram on p. 18), similar to the way children make chains of daisies by tying the head of one daisy to the end of another - hence the designation.

With daisy chaining none of the switch's CPU ports are used to connect to the next switch. The port capacity of a daisy chained installation is the total of all the CPU ports of all the KVM switches on the chain. For example, a KM0432 has 32 CPU ports. On an installation with eight daisy chained switches the number of available ports is 32 x 8 = 256.

Cascading involves using the CPU ports of a *Parent* KVM switch (one that is above a switch linked down from it) to connect to a *Child* KVM switch. With numerous Child switches linked down from the parent, the effect is reminiscent of the way water cascades down over a waterfall. Cascading adds capacity to a KVM installation, but the parent loses one CPU port for each cascaded KVM.

The KM0432 supports both daisy chaining and cascading. In addition, it supports combining the two - providing enormous capacity and flexibility for expanding the installation. The following sections provide the information and proecedures involved in setting up the various multilevel installations.

Daisy Chaining

Up to 7 additional KM0432 units can be daisy chained together; each capable of supporting four independent consoles. The first KM0432 is considered the **Master** unit; the daisy chained KM0432s are considered **Slaves**.

In a complete daisy chained installation, the four consoles that belong to the Master switch can access and control all of the computers (up to 256) on the installation. The four consoles belonging to each Slave switch only control the computers (up to 32) connected to their switch. (See the *Computer Connection Table*, p. 67, for a table showing the relation between the number of systems and the number of switches needed to control them.)

To set up a daisy chained installation, refer to the diagram on page 18 and do the following:

1. Make sure that power to all the devices you will be connecting up has been turned off.

2. Use a daisy chain cable set (described in the *Cables* section, p. 4), to connect the *Chain Out* port of the parent KM0432 unit to the *Chain In* port of the child KM0432 unit (First Station Out to Second Station In, Second Station Out to Third Station In, etc.).

   Note: You cannot use the *Chain In* port of the First Station KM0432, since it is the highest level parent.

3. If you wish to install any consoles on this switch, follow the procedure described for the *Single Stage Installation* on p. 12

4. Use KVM Adapter cables (described in the *Cables* section, p. 4), to connect any available CPU Port on the KM0432 to the Keyboard, Video and Mouse ports of the computers you are installing.

5. Repeat the above steps for any additional KM0432 units you wish to add to the chain.

6. Plug the power cord into an AC power source and into the KM0432's power socket.

7. Power up the installation according to the following procedure:

   a. Switch on the power for the First Station. Wait for the unit to ascertain its Station ID and display it on the Station ID LED. (The Station ID for the First Stage unit is **01**, the ID for the Second Stage unit is **02**, the ID for the Third Stage unit is **03**, etc.).

   b. Switch on the power for each Station on the installation in turn (Second Station, then Third Station, etc.). In each case, wait for the Station ID to be ascertained and displayed on the current Station before powering on the next one.

   c. After all the Stations are up, power on the computers.
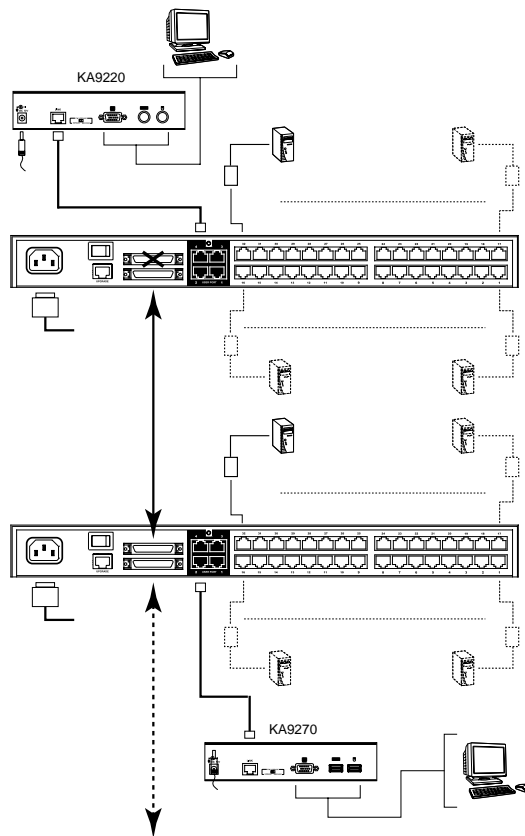
Cascading

Another way of adding capacity to your installation is to cascade additional KVM switches from the KM0432's CPU ports. Up to 32 additional KVM switches can be cascaded. Unlike daisy chaining, however, cascading does not increase the number of consoles that can be used to control the computers.

Note: 1. While you can daisy chain KM0432s, you cannot cascade them.

2. Switches cannot be cascaded beyond the second stage.

In a cascaded installation, the KM0432 is considered the **First Stage** unit; cascaded KVM switches are considered **Second Stage** units. The KM0432 supports two types of cascade: 1) Protocol Interface Cascading (see the installation diagram on p. 20), and 2) Physical Interface Cascading (see the installation diagram on p. 23).

Protocol Interface Cascading:

Protocol Interface Cascading refers to cascading to a second stage KVM switch (such as the eight port ATEN CS-138A) that uses the same data transfer protocol as the first stage KM0432.

With this type of cascade, all of the separate switch OSDs are integrated so that when the KM0432 consoles bring up the OSD, it lists all of the computers connected to all of the units. In a full cascade, 256 computers can be controlled from a single KM0432 (8 CS-138A ports x 32 KM0432 ports = 256 total ports).

To set up a Protocol Interface Cascade, refer to the installation diagram on p. 20 and do the following:

1. Make sure that power to all the devices you will be connecting up has been turned off.

2. Use Cat 5 cable to connect any available CPU Port on the First Stage unit (the KM0432) to a PS/2 style KVM adapter cable (as described in the *Cables* section, p. 4); plug the adapter cable's KVM connectors to the Keyboard, Video, and Mouse Console ports of the Second Stage unit.

    Note: The distance between the Second Stage unit and the KM0432 must not exceed 150m (500').

19

3. Use KVM cable sets (as described in the *Cables* section of the Second Stage unit's User Manual), to connect any available CPU port on the Second Stage unit to the Keyboard, Video, and Mouse ports of the computer you are installing.

4. Plug the Second Stage unit's power adapter into an AC source; plug the power adapter cable into the unit's Power Socket.

5. Repeat steps 2 - 4 for any other Second Stage units you wish to connect.

6. Turn on the power for the First Stage unit; 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 First stage unit has been powered on, the computers can be powered on.
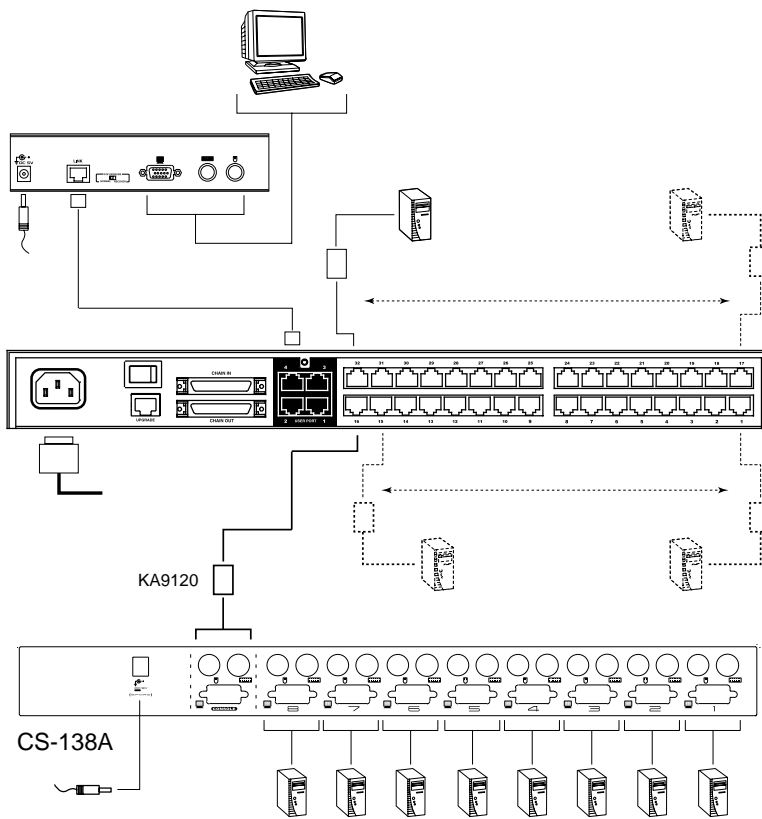
Physical Interface Cascading:

Physical Interface Cascading refers to cascading to a second stage KVM switch (such as the Altusen KH0116) that doesn't utilize the same protocol as the first stage KM0432, but uses the same physical interface (PS/2 or USB ports, for example).

The advantage of cascading to a switch like the KH0116 is that it yields enormous expansion capability. Since it can be daisy chained to 31 additional KH0116s, up to 16,384 computers can be controlled from a single KM0432 (32 KM0432 ports x 32 KH0116s x 16 ports per switch = 16,384 ports).

The operational difference between this method and Protocol Interface Cascading is that since the OSD protocols are not the same, the OSDs of the cascaded KH0116s cannot be integrated. Unlike Protocol Interface Cascading, the OSD that the operator works with is the OSD for each particular KH0116 - not an OSD that incorporates all of the switches on the installation.

Therefore, in order to access a computer connected to a particular KH0116, the operator must first bring up the KM0432's OSD to access the target KH0116. He then activates the KH0116's OSD to accesses the target computer.

In this type of installation, the KM0432 is considered the **First Stage** unit; the KH0116 is considered the **Second Stage** unit. If there are additional KH0116s daisy chained down from the Second Stage KH0116, the entire chain is seen as a Second Stage unit, with the top level KH0116 (the Master switch) as the OSD access point for the entire chain.

To set up a Physical Interface Cascade, refer to the installation diagram on p. 23, and do the following:

1. Make sure that power to all the devices you will be connecting up has been turned off.

2. Use Cat 5 cable to connect any available CPU Port on the First Stage unit (the KM0432) to a PS/2 style KVM adapter cable (as described in the *Cables* section, p. 4); plug the adapter cable's KVM connectors to the Keyboard, Video, and Mouse Console ports of the KH0116.

   Note: The distance between the Second Stage unit and the KM0432 must not exceed 150m (500').

3. Use KVM cable sets (as described in the *Cables* section of the KH0116's User Manual), 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 into an AC source and into the switch's Power Socket.

5. Repeat steps 2 - 4 for any other top level Second Stage units you wish to connect.

6. Turn on the power forthe First Stage unit; turn on the power for all Second Stage units; turn on the power to all the computers.

   Note: If you are daisy chaining KH0116s, follow the instructions provided in the KH0116 User Manual for chaining. Power on each chain according to the instructions in the manual.

2003-12-15

KA9120

KH0116

KH0116
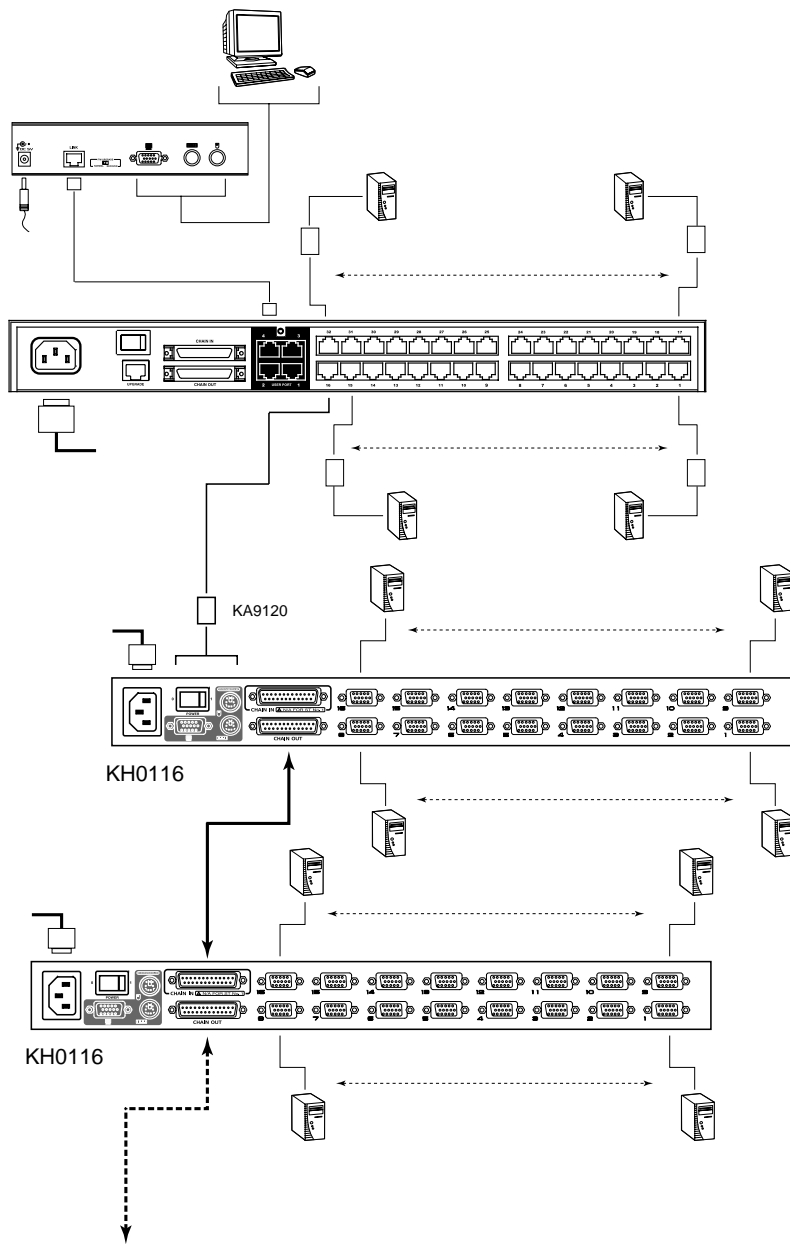
Daisy Chaining Plus Cascading Expansion

KM0432 units can be daisy chained to other KM0432 units to produce extremely large KVM matrixes. Under Protocol Interface Expansion, up to 8 daisy chained 32-port KM0432s can have 8 CS-138As cascaded from each port, allowing up to 2,048 computers and 32 consoles in a full installation (8 x 32 x 32 x 8).

The four consoles belonging to the Master KM0432 can access and control all of the ports on all of the switches on the entire installation. The four consoles belonging to each of the Slave units can access and control all of their own ports and all of the ports on all of the switches that are cascaded down from them.

Under Physical Interface Expansion up to 8 daisy chained 32-port KM0432s can have can have 16-port KH0116s cascaded from each port, and the KH0116s can be daisy chained to 32 levels, allowing up to 131,072 computers and 32 consoles in a full installation (8 x 32 x 32 x 16).

Protocol Interface Expansion

To set up a daisy chained/cascaded installation under Protocol Interface Expansion, refer to the diagram on p. 25, and do the following:

1. Follow the cabling up procedures given in the *Cascading* and *Daisy Chaining* sections.

2. Power up the daisy chained KM0432 Stations according to the sequence given in the *Daisy Chaining* section (p. 18).

3. After all the daisy chained KM0432 Stations are up, power on the cascaded Stations.

4. After all the cascaded Stations are up, power on the computers.

KA9120

KA9120
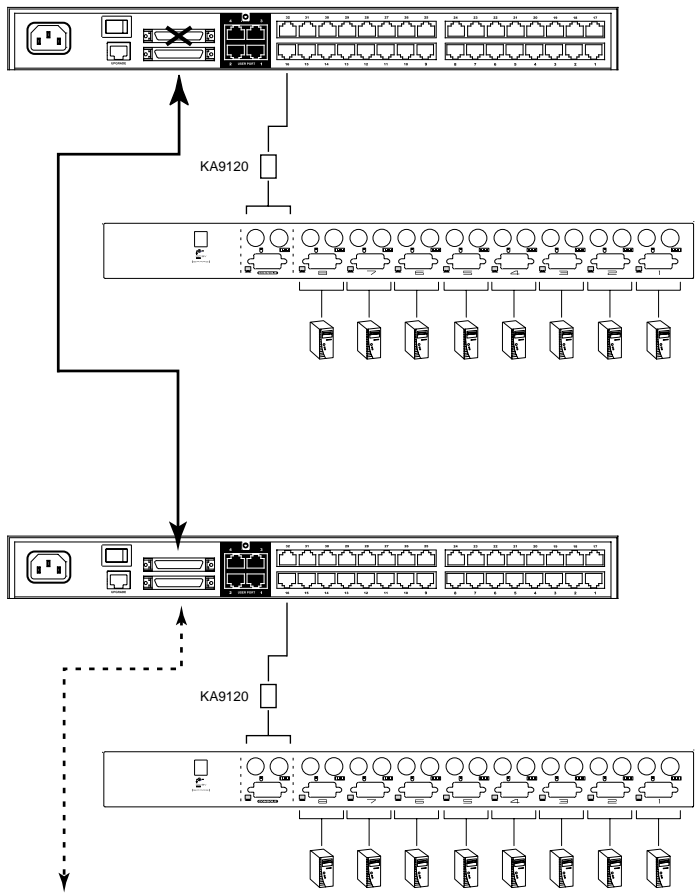
Physical Interface Expansion

To set up a daisy chained/cascaded installation under Physical Interface Expansion, refer to the diagram below, and do the following:

1. Follow the cabling up procedures given in the *Daisy Chaining* sections.

2. Power up the daisy chained KM0432 Stations according to the sequence given in the *Daisy Chaining* section (p. 18).

3. After all the daisy chained KM0432 Stations are up, power up each chain of KH0116s according to the instructions provided in the KH0116 User Manual.

4. After all the KH0116s are up, power on the computers.
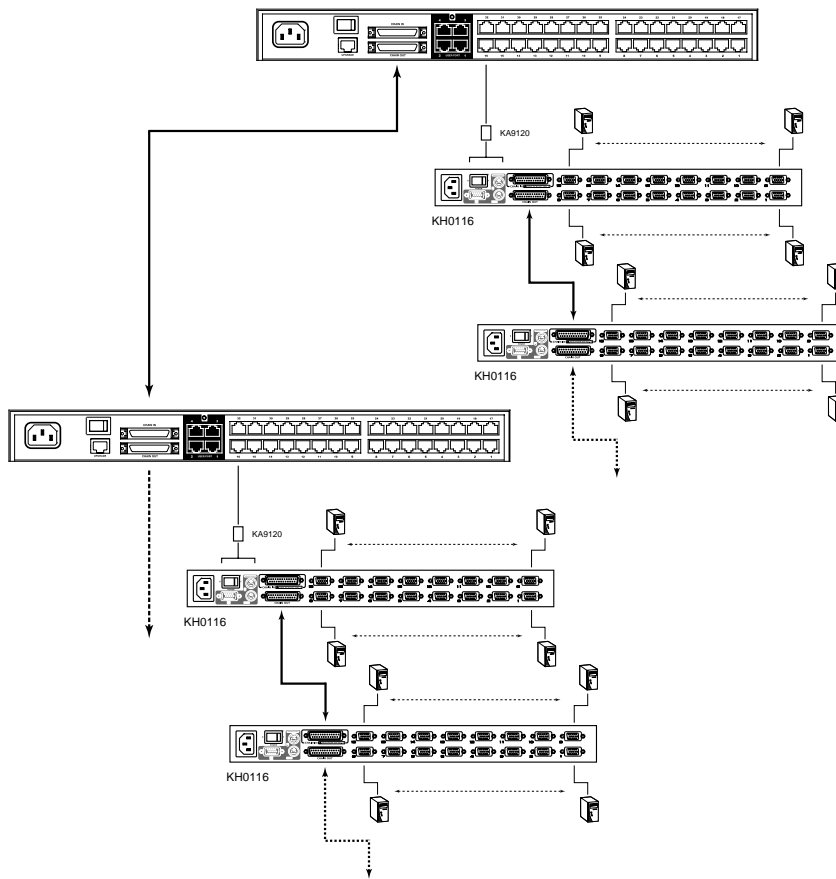
Topology Considerations

The use of RJ-45 CPU connectors, combined with Auto Signal Compensation (ASC), allow signals to travel up to 500 feet (150 meters) and still maintain reliability and high video resolution. This allows the KM0432 installation to take advantage of the internal CAT 5e and CAT6 wiring built in to most modern commercial buildings.

Note: Although the KM0432 supports legacy CAT5 wiring, the performance and video quality may degrade over longer distances.

Since the data signals are not transmitted in packets, the transmission can not go through network hubs or switches. Passive components such as patch panels, keystone jacks, patch cables, etc. can be used to channel the traffic, instead.

Basic Operations

Hot Plugging

The KM0432 supports *hot plugging* - components can be removed and added back into the installation by unplugging their cables from the ports without the need to shut the unit down. In order for hot plugging to work properly, however, the procedures described below must be followed:

Switching Station Positions:

On daisy chained installations, you can switch station positions by simply unplugging from the old parent and plugging into a new one.

Hot Plugging Console Ports:

Keyboard, monitor, and mouse can all be hot plugged. If you experience a problem after you plug in a new mouse, do a system reset by pressing the reset switch on the KM0432's front panel (see p. 6 for details). If this doesn't resolve the problem, restart the computers that have the problem.

Powering Off and Restarting

Powering off the KM0432 does not affect the computers attached to it. When you restart the KM0432, you will regain control immediately. To replace a KM0432, simply power it down; unplug the cables; plug them into the new unit; and power the new unit on.

Note: If any of the computers behave strangely after powering off and restarting, or changing a switch, simply restart the computer.

Port Selection

Port Selection is accomplished either by entering Hotkey combinations from the keyboard, or by means of the KM0432's OSD (On Screen Display). *OSD Operation* is discussed in detail in the next chapter; *Hotkey Port Selection* is discussed in chapter 4.

Although hotkeys are handy for a single stage installation, we strongly recommend you use the more powerful and versatile OSD - especially for daisy chained, cascaded, and combined installations.

Port ID Numbering

Each CPU port on a KM0432 installation is assigned a unique Port ID. You can access and control any computer on the installation by specifying the Port ID of the port that it is connected to. Depending on where the computer is on the installation, its Port ID will either have two or three parts.

Single Stage and Daisy Chained Installations:

For single stage and daisy chained installations, the Port ID is made up of two parts: a *Station Number*, and a *Port Number*:

- The *Station Number* - is a two digit number which reflects the switch's position in the daisy chain sequence. This corresponds to the number displayed on the front panel Station ID LED.
- The *Port Number* - reflects the port on the KM0432 Station that the computer is connected to.
- The Station Number precedes the Port Number.

Note: Station numbers from 1 - 9 are padded with a preceding zero, so they become 01 - 09.

For example, a computer attached to **Port 12** of **Station 6** would have a Port ID of: **06-12**.

Cascaded Protocol Interface Installations:

The Port ID for computers on Protocol Interface cascaded installations is made up of three parts:

- The *Station Number* of the KM4032
- The *Port Number* on on the KM0432 that the cascaded KVM switch links back to.
- The *Port Number* on the cascaded KVM switch that the computer is connected to.

For example, a computer attached to **Port 8** of a KVM switch that is cascaded from **Port 15** of a KM0432 in the **Station 10** position, would have a Port ID of: **10-15-8**.

Cascaded Physical Interface Installations:

Under Physical Interface Expansion, KH0116s are cascaded down from the KM0432. Since the OSD protocols are different, there are separate OSDs for each. When you invoke the OSD (see p. x), the KM0432 OSD screen comes up first. When you select the port that the target KH0116 is connected to, its OSD screen replaces the KM0432's, and you can select the computer you want to access from the KH0116 OSD screen.

Aside from this difference, the port numbering follows the examples shown above.

User Management and Security

The KM0432 permits the creation of 6 operator profiles when the switch is either on a stand alone installation or is the *Master* switch of a multilevel installation, as follows:

◆ 1 Super Administrator

◆ 1 Administrator

◆ 4 Users

On a single stage installation, four operators have simultaneous and independent control of 32 computers. In a daisy chained installation, a maximum of 32 operators can access the chain simultaneously (8 KM0432s x 4 operators each). Each *Slave* KM0432 also has 6 operator profiles, as above.

Note: 1. The Super Administrator can log in on a slave unit, but his authority only governs the segment he logs in on - just like that of an ordinary Administrator.

2. Operator *profiles* are different from actual operators. The KM0432 has four console ports and allows four actual operators to access the switch simultaneously. Operator profiles specify the rights assigned to particular operators. Theoretically, one operator can use the same operator profile to occupy all 4 console ports.

The Super Administrator has administrative power over the whole chain, he can assign and change passwords and access rights for all operators on all segments (see *SET USERNAME AND PASSWORD*, p. 40, and *SET ACCESSIBLE PORTS* p. 42).

The Administrator's power is limited to only that segment of the installation that the KM0432 he is logged in on controls. He can assign and change passwords and access rights for all operators on his segment.

Both Super Administrator and Administrator have full User rights. The four Users have no administrative rights. Depending on the permissions granted by the Super Administrator or Administrator, Users have varying degrees of control over the computers on the installation: Full Access; View Only; No Access. These rights are assigned on a port-by-port basis.

Operators (Super Administrator, Administrators, and Users) on the Master KM0432 can have User access rights to all ports on the Slave KVMs. Access rights are given by the Super Administrator or Administrator with the USER BUS AUTHORIZATION function (see p. 43).

The operators on Slave KVMs can only access computers on their segment. This includes any computers connected to KVM switches that are cascaded down from the KM0432 they are logged in on.
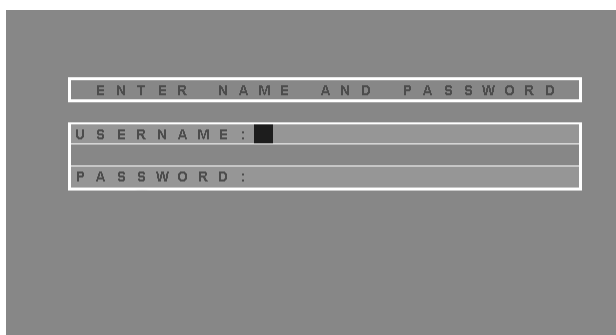
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Notes:

OSD Operation

OSD Overview

The KM0432 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.

Note: [Scroll Lock] is the default OSD hotkey. You can optionally change the Hotkey to the Ctrl key (see *OSD Hotkey*, p. 38, for details).

The login dialog box appears:

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 Super 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:

```
F1:GOTO    F3:SET     F5:SKP    F7:SCAN X
F2:LIST    F4:ADM     F6:BRC    F8:LOUT  zᶻ
SUPER ADMINISTRATOR              SN:02/08
  LIST:ALL
  PN      QV      ☼      NAME

  01 •     ◄      ☼      ATEN INTL.CO. 1     ▲
  02 •                   ATEN INTL.CO. 2     ▲
  03 •             ☼     ATEN INTL.CO. 3
  06 •     ◄      ☼      FAX SERVER 1
  05 •                   FAX SERVER 2
  06 • 3   ◄      ☼      WEB SERVER 1
  07 • 4                 WEB SERVER 2        ▼
  08 • 5   ◄      ☼      MAIL SERVER 1       ▼
```

Note: 1. The diagram depicts the Super Administrator's Main Screen. The User Main Screen does not show the **F4** and **F6** functions, since these are 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. 42, for details).

OSD Main Screen Headings

Heading	Explanation
SN	This field shows the Station Number that the currently selected port is connected to. The first number is the Station's position in the chain; the second number shows the total number of stations in the chain.
PN	This column lists the Port Numbers 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 *Set Quick View Ports*, p. 3-42), an arrowhead 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 *Edit Port Names*, p. 41), its name appears in this column.

OSD Navigation

Use the following procedures to navigate through OSD menus:

◆ To dismiss the Main Screen, and deactivate OSD, Click the **X** at the upper right corner of the OSD Window; or press **[Esc]**.

◆ To Logout, Click **F8** at the top of the Main Screen, or press **[F8]**.

◆ 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.

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 KM0432'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]**.
- Key in **3**, to go to a Station on the installation other than the ones connected to the Station you are logged in on (see *Bus Authorization*, p. 43). Only an authorized operator at the Master Station (the top level KM0432) can use this function.

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. 42), that match the Name or Port ID pattern, regardless of the current List settings (see *F2 LIST*, p. 37, 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 are currently displayed (listed) on the Main Screen. This function lets you broaden or narrow the scope of which ports the OSD lists on the Main Screen. The submenu choices and their meanings are given in the table below:

Choice	Meaning
ALL	Lists all of the ports on the installation.
POWERED ON	Lists only the ports that have their attached computers Powered On.
QVIEW	Lists only the ports that have been selected as Quick View Ports (see *SET ACCESSIBLE PORTS*, p. 42).
QVIEW + POWERED ON	Lists only the ports that have been selected as Quick View Ports (see *SET QUICK VIEW PORTS*, p. 42), and that have their attached computers Powered On.

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.

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. 47). If you shut down the KM0432 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)

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(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 *User Defined*, 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 *F7 SCAN*, p. 46). 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 Skip Mode (see *F5 SKP*, p. 44), and Auto Scan Mode (see *F7 SCAN*, p. 46). Choices are: **ALL** - All the Ports which have been set Accessible (see *SET ACCESSIBLE PORTS*, p. 42); **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 *SET QUICK VIEW PORTS*, p. 42); **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 *Quick View* setting rights (see *SET QUICK VIEW PORTS*, p. 42, 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 Command function in case a conflict with programs running on the computers occurs. The default is enabled.

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F4 ADM:

F4 is a Super Administrator and Administrator only function. It allows them to configure and control the overall operation of the OSD. To change a setting Double Click it; or 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. 47). If you shut down the KM0432 without first logging out, your changes are discarded.

Setting	Function
SET USERNAME AND PASSWORD	This function is used to set Usernames and Passwords: 1. One Super Administrator, one Administrator, and four User passwords can be set. 2. After you key in a name for the Super Administrator, Administrator, or User, a screen that allows you to key in the username and password appears. The username and 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.
SET LOGOUT TIMEOUT	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. 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 (disbabled).

(Table continues on next page)

(F4 ADM: continued)

Setting	Function

EDIT PORT NAMES	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:
	
	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:
	    ◆ All alpha characters: **a - z; A - Z**
	    ◆ All numeric characters: **0 - 9**
	    ◆ **+ - / : .** and **Space**
	
	    Case 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	This function is used to undo all changes and return the setup to the original factory default settings (see *FACTORY DEFAULT SETTINGS*, p. 68) - except for the *Names* settings that were assigned to the Ports, which are saved.
CLEAR THE NAME LIST	This function is similar to Restore Default Values. The difference is that it also clears the *Names* settings along with undoing all changes and returning the setup to the original factory default settings.
ACTIVATE BEEPER	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 *F7 SCAN*, p. 46); or an invalid entry is made on an OSD menu. The default is Y (activated).

(Table continues on next page)

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(F4 ADM: continued)

Setting	Function
SET QUICK VIEW PORTS	This function lets the Administrator select which Ports to include as Quick View ports. ◆ 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 *F2 LIST*, p. 37), 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 *SCAN/SKIP MODE*, p. 39), only a Port that has been selected here will be Auto Scanned. The default is for no ports to be selected.
SET ACCESSIBLE PORTS	This function allows the Administrator to define Operator access to the computers on the installation on a Port-by-Port basis. 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. **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.
SET ACCESS TIMEOUT	If there is no input from the console accessing a particular port for the amount of time set with this function, the port is released, allowing it to be accessed by the other consoles. To set the timeout value, key in a number from 0 - 255 seconds, then press **[Enter]**. If the number is 0 [zero], this function is disabled. The default is 5 seconds.

(Table continues on next page)

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(F4 ADM: continued)

Setting	Function
SET KEYBOARD LANGUAGE	This function allows the Administrator to define the keyboard language layout for each port. To assign a keyboard language, select the target port; then press the [Spacebar] to cycle through the choices: US English; Japanese; or French. The default is US English.
SET OPERATING PLATFORM	This function allows the Administrator to define the operating platform for the computer connected to each port. To assign an operating platform, select the target port; then press the [Spacebar] to cycle through the choices: Windows (PC compatible); Mac; and Sun. The default is Windows (PC compatible).
BUS AUTHORIZATION	This function allows the Super Administrator to authorize Operator access to Stations on the installation other than the ones connected to the Station the Operator is logged in on. For each Operator, 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 blank - No Operators have access rights to other Stations (and the computers connected to them).
FIRMWARE UPGRADE	In order to upgrade the KM0432's firmware (see Chapter 6), you must first invoke Firmware Upgrade Mode with this setting. Only the Super Administrator on the Master Station can utilize this function.

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F5 SKP:

This function enables you to easily skip backward or forward - switching the console focus from the currently active computer port to the previous or next available one.

- The selection of computers to be available for Skip Mode switching is made with the *Scan/Skip Mode* setting under the **F3 SET** function (see p. 39).

- When you are in Skip Mode, press **[←]** to switch to the previous computer in the List; press **[→]** to switch to the next computer in the List; press **[↑]** to switch to the last computer on the previous station in the List; press **[↓]** to switch to the first computer on the next station in the List.

    Note: When you Skip, you only Skip to the the previous or next available computer that is in the *Scan/Skip Mode* selection (see p. 39).

- When the focus switches to a Port has been selected for *Scan/Skip Mode*, a Left/Right Triangle symbol appears before its Port ID Display to indicate so.

- While Skip Mode is in effect, the console will not function normally. You must exit Skip Mode in order to regain control of the console.

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

F6 BRC:

F6 is a Super Administrator or Administrator only function. Clicking the **F6** field, or pressing **[F6]**, invokes Broadcast (BRC) Mode. When this function is in effect, commands sent from the console are broadcast to to all available computers on the installation.

This function is particularly useful for operations that need to be performed on multiple computers, such as performing a system wide shutdown, installing or upgrading software, etc.

BRC works in conjunction with the **F2 LIST** function. The LIST function (see p. 37), is used to broaden or narrow the focus of which Ports appear on the OSD Main Screen. When you Broadcast a command, it only goes to the Ports currently selected to be listed on the OSD Main Screen.

◆ While BRC Mode is in effect, a Speaker symbol appears before the Port ID Display of the port that currently has the console focus.

◆ While BRC Mode is in effect, the mouse will not function normally. You must exit BRC Mode in order to regain control of the mouse.

◆ To exit BRC Mode, invoke the OSD (with the OSD Hotkey), then Click the **F6** field, or press **[F6]**, to turn BRC Mode off.

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. 39).

- The amount of time that each Port displays for is set with the *Scan Duration* setting under the **F3 SET** function (see p. 39). When you want to stop at a particular location, press the 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 *Invoking Auto Scan*, p. 52, 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.

Cascaded OSD Operation

Under *Protocol Interface Cascading* (see p. 19), the OSDs of the cascaded switches are all seamlessly integrated into the KM0432's OSD so that all ports can be accessed from there.

Under *Physical Interface Cascading* (see p. 21), however, there are two separate OSDs: one for the KM0432, and one for the cascaded switch.

If both the KM0432 and the cascaded switch use the same OSD Hotkey ([Scroll Lock] [Scroll Lock], for example), both OSDs show up on the console monitor when you invoke the OSD.

The KM0432's OSD is on top, overlaying the OSD of the cascaded switch. To proceed, select the port that the cascaded switch is conncected to on the KM0432's OSD. The KM0432's OSD disappears, leaving the cascaded switch's OSD for you to work with.

You can eliminate this problem by selecting the alternate OSD Hotkey ([Ctrl] [Ctrl]) for the cascaded switch (see the switch's User Manual for details). With this method when you press [Scroll Lock] [Scroll Lock], only the KM0432's OSD comes up. To proceed:

1. Select the port that the cascaded switch is conncected to. The KM0432's OSD disappears.

2. Tap [Ctrl] [Ctrl] to bring up the cascaded switch's OSD for you to work with.

Hotkey Operation

Hotkey Port Control

Hotkey Port Control allows you to provide KVM focus to a particular computer directly from the keyboard.

Note: Hotkeys work best in single stage and basic cascaded or daisy chained installations. For complicated daisy chain+cascaded installations, it is simpler, more convenient, and more efficient to use the OSD.

The KM0432 provides the following Hotkey Port Control features:

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

Invoking Hotkey Mode

All Hotkey operations begin by invoking Hotkey Mode (HKM). Invoking HKM takes three steps:

1. Hold down the **Num Lock** key;

2. Press the ∗ key;

3. Simultaneously release both keys:

    [Num Lock] + [∗]

When HKM is active:

◆ The Caps Lock, and Scroll Lock LEDs flash in succession to indicate so. They stop flashing and revert to normal status when you exit HKM.

◆ A Command Line appears at the bottom of the monitor screen. The command line prompt is the word *Hotkey:* in white text on a blue background. Text that you key in while in HKM displays here.

◆ 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. 29). 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. 49).

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.

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Auto Scanning

Auto Scan switches among all the CPU Ports that are accessible to the current Operator at regular intervals (see *Scan/Skip Mode*, p. 39, for information regarding accessible ports). This function is convenient for automatically monitoring the activity of the computers on the installation.

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. 39). You can change the scan interval before activating Hotkey Auto Scanning, if you wish, with the following Hotkey combination:

1. Invoke HKM (see p. 49).

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 HKM, and are ready to invoke Auto Scanning.

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Invoking Auto Scan:

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

1. Invoke HKM (see p. 49).

2. Press **[A]**.

   After you press **A**, you automatically exit HKM, and enter Auto Scan Mode, and Auto Scanning begins.

   - 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. During the time that Auto Scanning is paused, the Command Line displays: **Auto Scan: Paused.**

     Pausing and *Exiting* are the two ways to stop scanning and keep the focus on a particular computer. If you intend to continue scanning after a brief stop, *Pausing* is more convenient than *Exiting* Auto Scan Mode completely.

     This is because when you Resume scanning after Pausing, you start from where you left off. On the other hand, if you Exit and then restart Auto Scan, you start over from the very first computer on the installation.

     To *Resume* Auto Scanning after you Pause, press any key or Left Click. Scanning continues from where it left off.

   - 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.

3. To exit Auto Scan Mode press **[Esc]** or **[Spacebar]**. Auto Scanning stops when you exit Auto Scan Mode.

Skip Mode

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

1. Invoke HKM (see p. 49).

2. Key in **[Arrow]**

   ◆ Where [Arrow] refers to one of the Arrow keys. After you press [Arrow], you automatically exit HKM, and enter Skip Mode where you can switch ports as follows:

←	Skips from the current port to the first accessible port previous to it. (See *Scan/Skip Mode*, p. 3-39, for information regarding accessible ports.)
→	Skips from the current port to the next accessible port.
↑	Skips from the current port to the last accessible port of the previous Station.
↓	Skips from the current port to the first accessible port of the next Station.

   ◆ Once you are in Skip Mode, you can keep on skipping by pressing the Arrow keys. You don't have to use the [NumLock] + [∗] combination each time you want to skip.

   ◆ 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.

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

Hotkey Beeper Control

The Beeper (see Activate Beeper, p. 41) can be Hotkey toggled On and Off. To toggle the Beeper, key in the following Hotkey combination:

1. Invoke HKM (see p. 49).

2. Press **[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 HKM.

Hotkey Summary Table

[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 andSkips from the current port to the first accessible port previous to it.
	[→]	Invokes Skip Mode andSkips from the current port to the next accessible port.
	[↑]	Invokes Skip Mode andSkips from the current port to the last accessible port of the previous Station.
	[↓]	Invokes Skip Mode andSkips from the current port to the first accessible port of the next Station.
	[B]	Toggles the Beeper On or Off.

Multiplatform Support

The KM0432 provides the utmost in flexibility for your installation by offering multiplatform support. Through the use of Console Modules and KVM Adapter Cables, PS/2 and USB interfaces can be mixed and matched at the console side, and PS/2, USB and Sun interfaces can be mixed and matched at the computer side. With this approach, either type of console can access and control multiple computer types - PC compatible, Sun and Mac. (See pp. 4 and 8 for hardware setup details.)

The PC Compatible (101/104 key) keyboard can emulate the functions of the Sun Mac keyboards. The corresponding functions are shown in the tables on the following pages.

Sun Keyboard Emulation

PC Keyboard	Sun Keyboard
[Ctrl] [T]	Stop
[Ctrl] [F2]	Again
[Ctrl] [F3]	Props
[Ctrl] [F4]	Undo
[Ctrl] [F5]	Front
[Ctrl] [F6]	Copy
[Ctrl] [F7]	Open
[Ctrl] [F8]	Paste
[Ctrl] [F9]	Find
[Ctrl] [F10]	Cut
[Ctrl] [1]	🔇
[Ctrl] [2]	🔉
[Ctrl] [3]	🔊
[Ctrl] [4]	🌙
[Ctrl] [H]	Help
App	Compose
Win Key	◆

Note: When using [Ctrl] combinatons, press and release the **Ctrl** key, then press and release the activation key.

Mac Keyboard Emulation

PC Keyboard	Mac Keyboard
[Shift]	Shift
[Ctrl]	Ctrl
[Win]	⌘
F12	⏏
[Alt]	L Alt/Option
[Prt_Sc]	F13
[Scroll Lock]	F14
[Desktop Menu]	=
[Enter]	Return
[Back Space]	Delete
[Ins]	Help
[Ctrl] [Desktop Menu]	F15

Note: When using key combinatons, press and release the first key (Ctrl or Alt), then press and release the activation key.

Notes:

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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/support
```

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

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 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 Cat 5 cable to connect the KM0432's Firmware Upgrade Port to a hub that the computer you used in Step 1 connects to.

   Note: On a daisy chained installation, connect the cable to the First Station unit. The chained stations will receive the upgrade via the daisy chain cables.
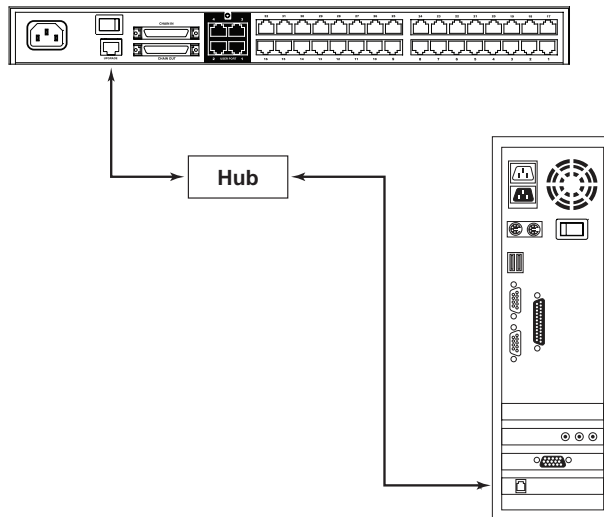
4. Shut down all of the computers - but not the Stations - on your KVM installation.

5. From your KVM switch console, bring up the OSD (see p. 33) and select the **F4ADM** function.

6. Scroll down to FIRMWARE UPGRADE. Press [Enter], then press [Y] to invoke Firmware Upgrade Mode.

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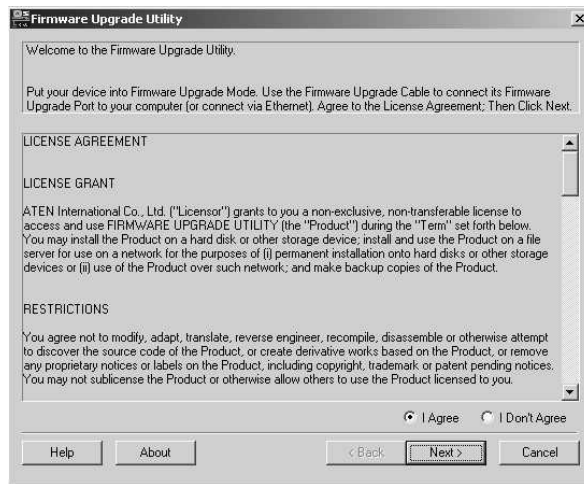
2. Read and *Agree* to the License Agreement (enable the I Agree radio button).

3. Click Next to continue. The Firmware Upgrade Utility main screen appears:
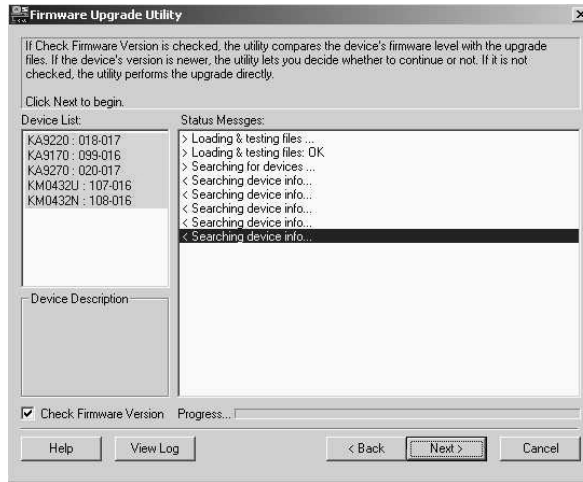
The Utility inspects your installation. The devices capable of being upgraded by the package are listed in the *Device List* panel.

Note: 1. Although only one device type is shown in the list (KA9220, for example), all units of that type receive the upgraded.

2. KM0432U refers to the first station in a daisy chained configuration; KM0432N refers to the chained stations.

3. A blue background behind the device name indicates that it is ready to be upgraded.

4. When the list is complete, click **Next** to start the upgrade.

◆ If you enabled *Check Firmware Upgrade*, the Utility compares the device's firmware level with that of the upgrade files. If it finds that the device's version is higher, it brings up a dialog box informing you of the situation and gives you the option to Continue or Cancel.
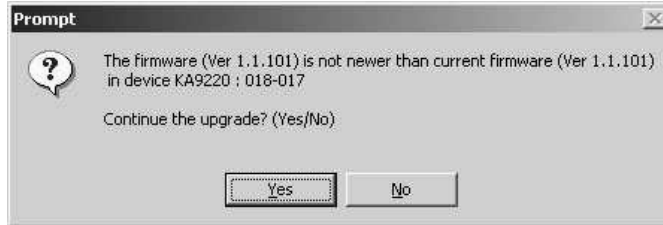
◆ If you didn't enable *Check Firmware Upgrade*, the Utility installs the upgrade files without checking their version level.

◆ While a device group is being upgraded, the background behind its name changes to green and blinks on and off to indicate that upgrading for that device group is in progress.

◆ As the Upgrade proceeds, status messages appear in the *Status Messages* panel, and the progress toward completion is shown on the *Progress* bar.
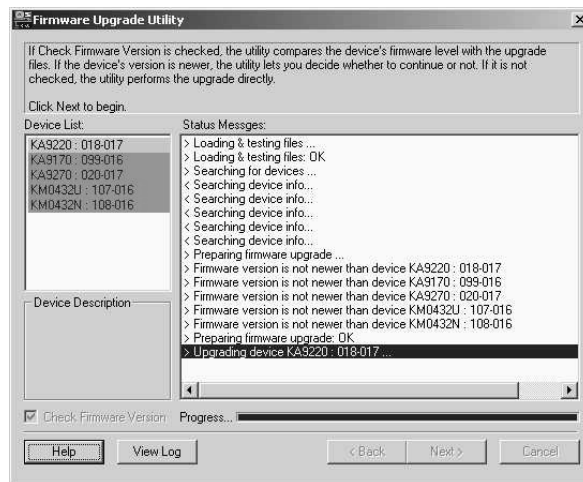
- ◆ As each device update completes, its status is reported in the *Status Messages* panel.

- ◆ When a device group upgrade is successful, the background behind the device group name changes to pink to indicate so; if a member of a device group fails to upgrade successfully, the background behind the device group name changes to red to indicate that there was an upgrade failure in the group. Check the Status Messages to ascertain which device failed to upgrade.
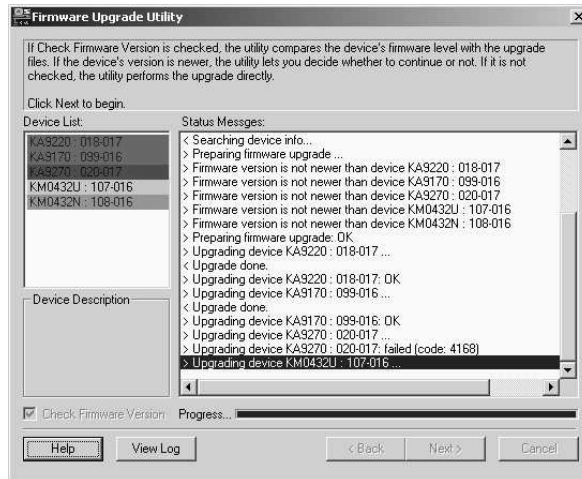
5. When upgrading for all the devices has completed, click **Finish** to close the Firmware Upgrade Utility.

Upgrade Failure

If the upgrade fails to complete successfully for all devices:

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

2. Start the firmware upgrade procedure again (see p. 61).

3. When the Device List is complete, Click on the device group that the failed device belongs to in the Device List panel (see p. 62).

4. Click **Next** to start the upgrade.

Appendix

Connection Tables

The following tables indicate the relationship between the number of KVM units and the number of computers that they control:

KM0432 Daisy Chain

KM0432s	Computers
1	1 - 32
2	33 - 64
3	65 - 96
4	97 -128
5	129 - 160
6	161 - 192
7	193- 224
8	225 - 256

KM0432 Cascade to ATEN CS-138A

KVMs	Computers	KVMs	Computers	KVMs	Computers	KVMs	Computers
1	32 - 39	9	88 - 95	17	144 - 151	25	200 - 207
2	39 - 46	10	95 - 102	18	151 - 158	26	207 - 214
3	46 - 53	11	102 - 109	19	158 - 165	27	214 - 221
4	53 - 60	12	109 - 116	20	165 - 172	28	221 - 228
5	60 - 67	13	116 - 123	21	172 - 179	29	228 - 235
6	67- 74	14	123 - 130	22	179 - 186	30	235 - 242
7	74 - 81	15	130 - 137	23	186 - 193	31	242 - 249
8	81 - 88	16	137 - 144	24	193 - 200	32	249 - 256

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/Skip Mode	All
Screen Blanker	0 (Disabled)
Hotkey Command Mode	Enabled
Logout Timeout	0 (Disabled)
Beeper	Y (Activated)
Quick View Ports	No ports selected
Accessible Ports	F (Full) For all Users on all Ports
Access Timeout	5 seconds
KB Lang. Operating Platform	PC compatible
Bus Authorization	Blank - No Operators have access rights

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 remove the top cover of the Switch module case.

2. Short the jumper labeled *Default Password* at the right front of the switch's main board.
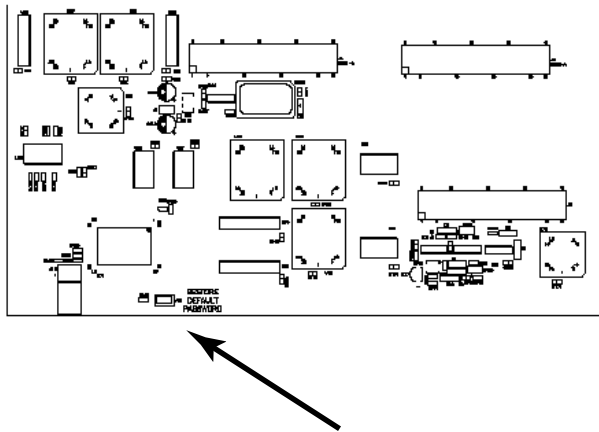
3. Power on the switch.

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

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

4. After you start back up, the OSD login function acts exactly the way it did the first time the switch was run (see p. 34) and you can reset passwords for the Administrators and Users.

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Specifications

KM0432

Function		Specification
Computer Connections	Direct	32
	Max	256 (via 8 level daisy chain) 256 (via 2 level cascade) 2048 (via 8 level daisy chain + 2 level cascade)
Console Connections		4 Direct; 32 Max. (via 8 level daisy chain)
Port Selection		OSD (On Screen Display); Hotkeys
LEDs	On Line/Selected	32 dual colored (Green / Red)
	Power	1 (Blue)
	Station ID	2 x 7 segments (Yellow)
Connectors	Computers	32 x RJ-45 F
	Consoles	4 x RJ-45 F
	Daisy Chain	2 x HDB-60 F
	Firmware Upgrade	1 x RJ-45 F
	Power	1 x Full Range AC Power Port
Switches	Reset	1 x Pushbutton (semi-hidden)
	Power	1 x Rocker
	F/W Upg. Recover	1 x Slide
Keyboard/Mouse Emulation		PS/2; Sun; USB (PC, Sun, Mac)
Scan Interval		0 - 255 secs.
Power Consumption		120V - 230V
Video		1024 x 768 @ 150m; DDC2B
Environment		Operating Temperature: 0 - 50° C Storage Temperature: -20 - 60° C Humidity: 0 - 80% RH, NC
Housing		Metal
Weight		3.95 Kg
Dimensions (L x W x H)		43.24 x 25.42 x 4.4 cm

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Console Modules

Function		KA9220	KA9270
Connectors	Console KB	1 x mini-DIN-6 F	1 x USB Type A
	Console Mouse	1 x mini-DIN-6 F	1 x USB Type A
	Console Monitor	1 x HDB-15 F	
	Link to KM0432	1 x RJ-45 F	
	Power	1 x DC 5V	
LEDs	On Line	1 (Amber)	
	Link	1 (Green)	
Switches		1 x Slide (FW Upgrade Recovery)	

KVM Adapter Cables

Function		KA9120	KA9170	KA9130
Connector Plugs	KB	1 x mini-DIN-6 M	1 x USB Type A	1 x mini-DIN-8M
	Mouse	1 x mini-DIN-6 M		
	Monitor	1 x HDB-15 M		1 x 13W3 M
	Link	1 x RJ-45 F		
LEDs	On Line	1 (Amber)		
	Link	1 (Green)		
Switches		1 x Slide (FW Upgrade Recovery)		

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Troubleshooting

Symptom	Possible Cause	Action
Operator can only access one port on a cascaded KVM. Cannot switch to any of the other ports.	The cascaded KVM's display channel is being occupied by a previous user.	There is only one display channel for all the ports on a cascaded KVM switch. The previous opeator's access timout expired (see p. 42), so the port is released, but his logout timeout has not expired so the display channel has not been released. To avoid this problem, be sure to set a reasonable logout timeout (see p. 40), for all users.

Limited Warranty

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