ALTUSCN™

Enterprise KVM Solutions by ATEN

Matrix KVM Switch™
KM0216 / KM0432
User Manual

www.aten.com

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.

RoHS

This product is RoHS compliant.

SJ/T 11364-2006

The following contains information that relates to China.

部件名称	有毒有害物质或元素					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
电器部件	●	○	○	○	○	○
机构部件	○	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006规定的限量要求之下。

●: 表示符合欧盟的豁免条款，但该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006的限量要求。

×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006的限量要求。

User Information

Online Registration

Be sure to register your product at our online support center:

International		http://support.aten.com
North America	ATEN TECH	http://www.aten-usa.com/product_registration
	ATEN NJ	http://support.aten.com

Telephone Support

For telephone support, call this number:

International		886-2-8692-6959
North America	ATEN TECH	1-888-999-ATEN
	ATEN NJ	1-732-356-1703

User Notice

All information, documentation, and specifications contained in this manual are subject to change without prior notification by the manufacturer. The manufacturer makes no representations or warranties, either expressed or implied, with respect to the contents hereof and specifically disclaims any warranties as to merchantability or fitness for any particular purpose. Any of the manufacturer's software described in this manual is sold or licensed *as is*. Should the programs prove defective following their purchase, the buyer (and not the manufacturer, its distributor, or its dealer), assumes the entire cost of all necessary servicing, repair and any incidental or consequential damages resulting from any defect in the software.

The manufacturer of this system is not responsible for any radio and/or TV interference caused by unauthorized modifications to this device. It is the responsibility of the user to correct such interference.

The manufacturer is not responsible for any damage incurred in the operation of this system if the correct operational voltage setting was not selected prior to operation. PLEASE VERIFY THAT THE VOLTAGE SETTING IS CORRECT BEFORE USE.

Package Contents

The KM0216 / KM0432 package consists of:

1   KM0216 or KM0432 Matrix KVM Switch

1   Power Cord

1   Rack Mount Kit (brackets and Phillips hex head M3 x 8 screws)

1   Foot Pad Set (4 pcs.)

1   User Manual*

1   Quick Start Guide

1   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 KM0216 / KM0432 installation.

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* Features may have been added to the KM0216 / KM0432 since this manual was printed. Please visit our website to download the most up to date version of the manual.

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About This Manual

This User Manual is provided to help you get the most from your KM0216 / KM0432 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 KM0216 / KM0432 system. Its purpose, features and benefits are presented, and its front and back panel components are described.

Chapter 2, Hardware Setup, provides step-by-step instructions for setting up your installation, and explains some basic operating procedures.

Chapter 3, OSD Operation, provides detailed information for configuring and controlling your installation using the KM0216 / KM0432's intuitive, mouse-driven On Screen Display (OSD) menus.

Chapter 4, Keyboard Port Operation, explains the concepts and procedures used to control the KM0216 / KM0432 from the keyboard.

Chapter 5, Keyboard Emulation, lists the keys for a PC-compatible keyboard to emulate the functions of the Mac and Sun keyboards.

Chapter 6, The Firmware Upgrade Utility, explains how to upgrade the KM0216 / KM0432's flash firmware version.

An Appendix, at the end of the manual provides technical and troubleshooting information.

Conventions

This manual uses the following conventions:

Monospaced	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, but do not involve sequential steps.
→	Indicates selecting the option (on a menu or dialog box, for example), that comes next. For example, Start → Run means to open the *Start* menu, and then select *Run*.
⚠	Indicates critical information.

Product Information

For information about all ALTUSEN products and how they can help you connect without limits, visit ALTUSEN on the Web or contact an ALTUSEN Authorized Reseller. Visit ALTUSEN on the Web for a list of locations and telephone numbers:

International		http://www.aten.com
North America	ATEN TECH	http://www.aten-usa.com
	ATEN NJ	http://www.aten.com

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Introduction

Overview

The KM0216 / KM0432 Matrix KVM Switch gives IT administrators in large corporations advanced control of multiple servers. Operators working at up to two (KM0216) or four (KM0432) consoles (keyboard, mouse, and monitor) can simultaneously and independently take direct control of up to 16 (KM0216) or 32 (KM0432) computers. With a combination of daisy-chaining and cascading, up to 16 or 32 operators can access and control up to 1,024 or 2,048 computers.

The 2 / 4 consoles belonging to the highest level KM0216 / KM0432 are able to access all the computers on the installation – those that are directly connected as well as those that are daisy-chained and cascaded. The 2 / 4 consoles belonging to each of the Slave units (the daisy-chained KM0216 / KM0432s), however, can only access the computers that are connected to them on the same daisy-chain level (directly connected and cascaded).

The KM0216 / KM0432 features a console module design with automatic console conversion that allows any combination of PS/2 and USB consoles to control any combination of PS/2, USB, or Sun computers. The RJ-45 port 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 need for KVM extenders, and allowing the installation to take advantage of the internal Cat 5e and Cat 6 wiring built in to most modern commercial buildings. In addition, use of RJ-45 connectors saves precious IT real estate by allowing a full 16 or 32 KVM 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 KM0216 / 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 means of a powerful menu driven On Screen Display (OSD) system, or by entering *Hotkey* combinations from the keyboard. A convenient *Auto Scan* feature also permits automatic scanning and monitoring of the activities of all computers running on the installation one by one.

Features

- Two or four consoles independently and simultaneously control up to 16 or 32 directly connected computers

- Daisy-chain up to 7 additional units

- Cascade up to 16 or 32 compatible KVM switches from each station

- Up to 16 or 32 consoles control all of the computers on a daisy-chained/ cascaded installation

- Compact design – rack mountable 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

- 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

- Auto-sensing of station's position on daisy-chain installations; OSD and front panel LED indicates station's position

- Port names automatically reconfigured when 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 – 1024 x 768 @ 60Hz for up to 150m; 1920 x 1440 @ 60Hz (distance depends on installation environment)

- 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

- Free lifetime flash firmware upgrades

- Firmware upgrades to all chained KVM switches at the same time via daisy-chain cable

Requirements

Console

The following hardware components are required for each console:

◆ A VGA, SVGA, or MultiSync monitor capable of displaying the highest resolution provided by any computer in the installation

◆ Keyboard and mouse (PS/2 or USB)

Console modules are required to connect consoles to the KM0216 / KM0432. They provide flexibility for your installation by allowing PS/2 and USB interfaces to be mixed and matched at the console side. The console modules currently available are listed in the table below. Contact your dealer for details or refer to the documentation included with your console module.

Function	Model Number
PS/2 Console Module	KA9222
USB Console Module	KA9272

Remote Computers

The following hardware components are required for each computer:

◆ A VGA, SVGA, or MultiSync video graphics card with an HDB-15 port; or, for legacy Sun systems, a Sun 13W3 video port

◆ PS/2 keyboard and mouse ports (6-pin Mini-DIN); or, at least one USB port; or, for legacy Sun systems, a Sun style keyboard port (8-pin Mini-DIN)

KVM adapter cables are required to connect computers to the KM0216 / KM0432. Similar to console modules, they allow PS/2, USB, Sun, Mac, and serial computers to be attached to the KM0216 / KM0432. The KVM adapter cables currently available are listed in the table below. Contact your dealer for details.

Function		Model Number
KVM Adapter Cable (CPU Module)	For PS/2 computers	KA9120
	For Sun Legacy computers	KA9130
	For Sun USB computers	KA9131
	For serial devices[a]	KA9140
	For USB computers	KA9170

a. See *KA9140 RS-232 Connector Pin Assignments*, page 72.

Cables

One or more of the following cables are required for use with the KM0216 / KM0432:

Function	Type
Console Module or KVM Adapter Cable to KM0216 / KM0432 (see page 71)	Cat 5 cable
Daisy-chain Cables	LIN5-50H1-H12 (15 cm) 2L-1700KM (60 cm) 2L-1701KM (1.2 m) 2L-1704KM (4 m)

<u>Operating Systems</u>

Supported operating systems are shown in the table, below:

OS		Version
Windows		95 and higher
Linux	RedHat	6.0 and higher
	SuSE	8.2 and higher
	Mandriva (Mandrake)	9.0 and higher
UNIX	AIX	4.3 and higher
	FreeBSD	3.51 and higher
	Sun	Solaris 8 and higher
Novell	Netware	5.0 and higher
Mac		OS 8.6 and higher
OS/2		2.0 and higher
DOS		6.22 and higher

Front View

KM0216
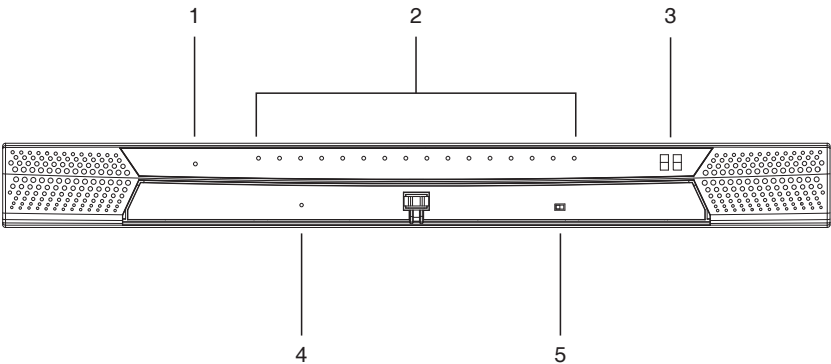
KM0432

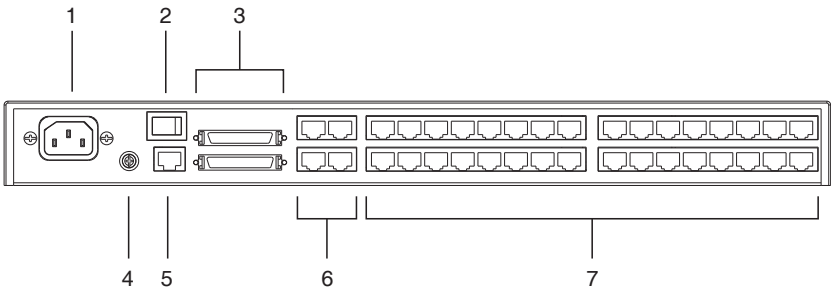| No.	Component	Description
1	Powed LED	Lights (blue) to indicate that the unit is receiving power.
2	Port LEDs	◆ A steady amber light indicates the KVM port is selected and the connected computer is powered on.
		◆ A flashing amber light indicates the KVM port is selected and the KVM port is cascaded to a powered on KVM switch.
		◆ A steady green light indicates the KVM port is not selected, and the connected computer is powered on.
		◆ A flashing green light indicates the KVM port is not selected and the KVM port is cascaded to a powered on KVM switch.
		◆ A steady red light indicates the KVM port is selected, and the connected computer is off, or there is no computer connected.
		◆ The LED does not light when a KVM port is not selected and the connected computer is off.
3	Station ID LED	The KM0216 / KM0432's Station ID is displayed here. If this is a Single Station installation (see page 16), or the First Station on a Daisy-chained installation (see page 21), the KM0216 / KM0432 has a Station ID of 01.
		On a Daisy-chained installation, the KM0216 / KM0432 auto-senses its position and displays the Station ID that corresponds to its place in the chain (see *Port ID Numbering*, page 30, for details).
4	Reset Button	Pressing in this button performs a system reset. When the system is reset, the KM0216 / KM0432 beeps, then the KVM port LEDs flash in succession until the reset is completed. After the reset is completed you can login again.
		Note: This button is semi-recessed and must be pushed with a small object – such as the end of a paper clip or a ballpoint pen.
5	Firmware Upgrade Switch	During normal operation and while performing a firmware upgrade, this switch should be in the NORMAL position. If a firmware upgrade operation does not complete successfully, this switch is used to perform a firmware upgrade recovery. See *Firmware Upgrade Recovery*, page 62 for details.

Rear View

KM0216
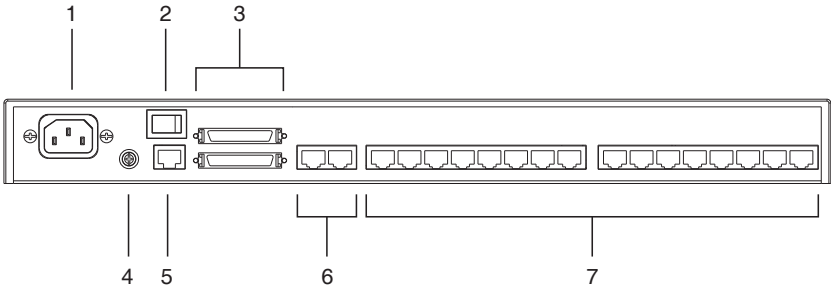
KM043

| No.	Component	Description
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 KVM switch on and off.
3	Daisy-chain Ports	When daisy-chaining stations (see page 21), the daisy-chain cables plug in here.
		The upper port is the *Chain In* port; the lower one is the *Chain Out* port. The Chain In port is not used on the Master (First Stage) unit.
4	Grounding Terminal	The grounding wire used to ground the unit attaches here.
5	Firmware Upgrade Port	The Cat 5 cable that transfers the firmware upgrade data from the administrator's computer to the KM0216 / KM0432 plugs into this RJ-45 connector (see page 57).
6	User Ports	The Cat 5 cables from the console modules plug in here.
7	KVM Ports	The Cat 5 cables that link the KVM adapter cables to the KM0216 / KM0432 plug in here.

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Chapter 2
Hardware Setup

Overview

For convenience and flexibility that allows mixing the PS/2 and USB interfaces, the KM0216 / 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:
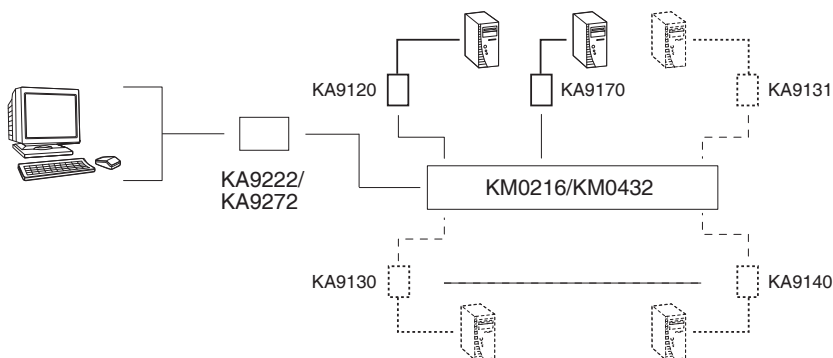
A separate console module is required for each console; likewise, a separate KVM adapter cable is required for each computer. The console modules and KVM adapter cables are listed in the *Cables* section on page 4. Consult your dealer to find out which console modules and KVM adapter cables best fit your needs.

Before you Begin

1. Important safety information regarding the placement of this device is provided on see page 63. Please review it before proceeding.

2. 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.

Stacking and Rack Mounting

The KM0216 / KM0432 can be stacked on the desktop or rack mounted by different methods in 1U of rack space. The procedures for each method are described in the following sections.

Note: 1. The rack mounting kit does not include screws or cage nuts for attaching the KM0216 / KM0432 to a rack. If you need additional screws or cage nuts, contact your rack dealer.

2. Allow at least 5.1 cm on each side for adequate ventilation and 12.7 cm at the rear for power cord and cable clearance.

3. The installation diagrams that follow use a KM0432 for the examples. Since the KM0216 installation is essentially the same as that of the KM0432 (except for having fewer ports), if you are setting up a KM0216 installation, you can simply follow the KM0432 diagrams.

Stacking

The KM0216 / KM0432 can be placed on any level surface that can safely support its weight and the weight of the attached cables. Ensure that the surface is clean and free of materials that can block the exhaust vents or otherwise interfere with normal operation of the switch. A foot pad set is included with the unit. Peel the protective backing off of the foot pads, and then affix the foot pads to the bottom panel of the KM0216 / KM0432 at the corners, as shown in the diagram below.
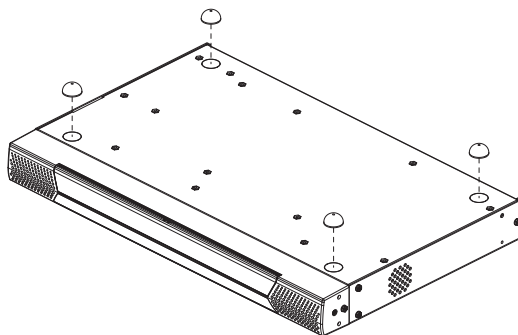
Rack Mounting – Front

1. Remove the two screws from the sides at the front of the unit.

Phillips head hex
M3 x 6
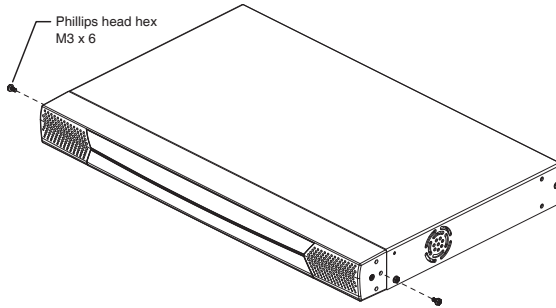
2. Use the M3 x 8 Phillips hex head screws supplied with the rack mounting kit to screw the rack mounting brackets into the sides at the front of the unit.
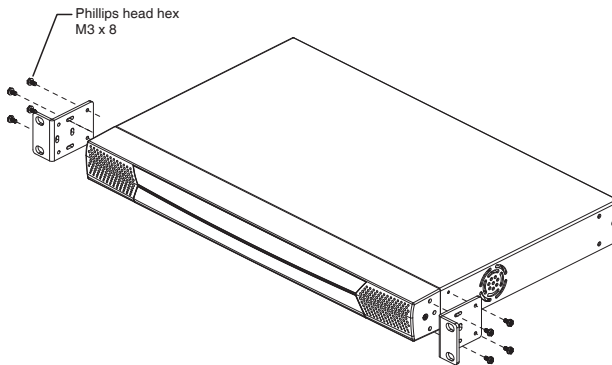
Phillips head hex
M3 x 8

(Continues on next page.)

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3. Place the switch in the rack. Position it so that the holes in the mounting brackets line up with those in the rack. Secure the mounting brackets to the rack.

Rack Mounting – Rear

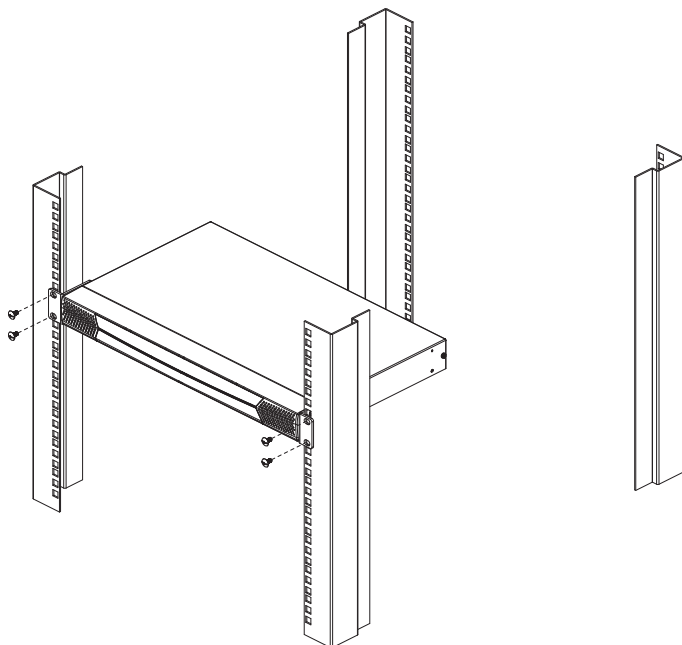1. Remove the two screws from the sides at the rear of the unit.

Phillips head hex
M3 x 6
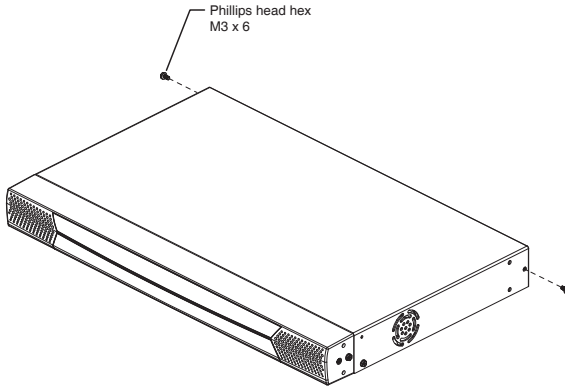
2. Use the M3 x 8 Phillips head hex screws supplied with the rack mounting kit to screw the rack mounting brackets into the sides at the rear of the unit.
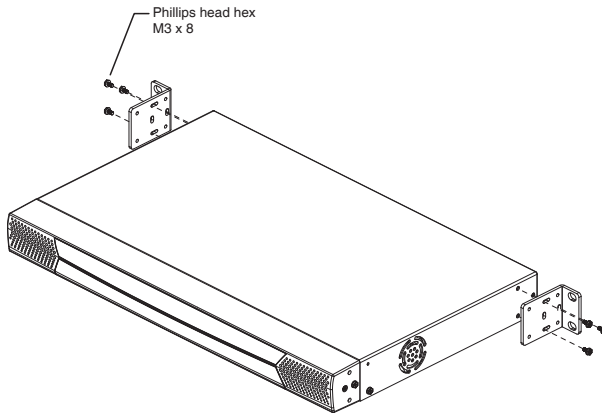
Phillips head hex
M3 x 8

(Continues on next page.)

(Continued from previous page.)

3. Place the switch in the rack. Position it so that the holes in the mounting brackets line up with those in the rack. Secure the mounting brackets to the rack.
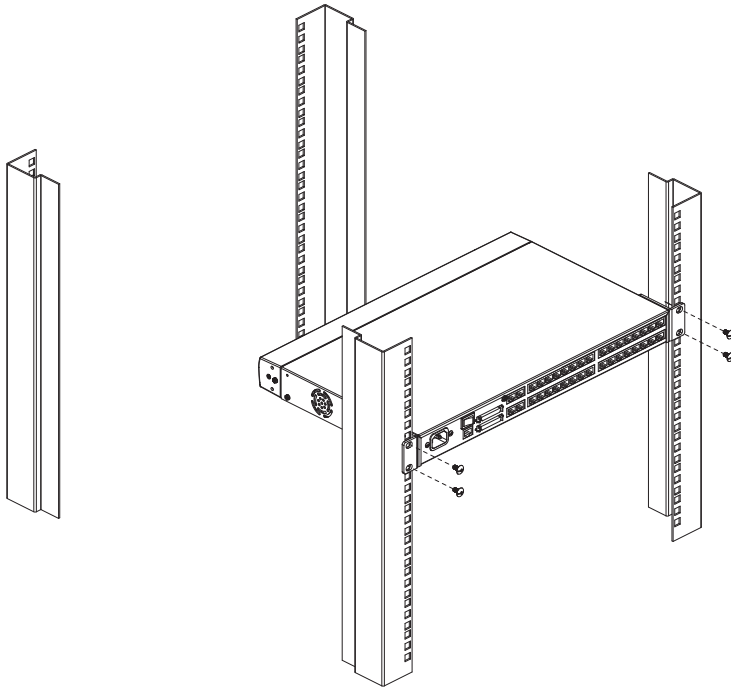
Grounding

To prevent damage to your installation it is important that all devices are properly grounded.

Use a grounding wire to ground the KM0216 / KM0432 by connecting one end of the wire to the grounding terminal, and the other end of the wire to a suitable grounded object.
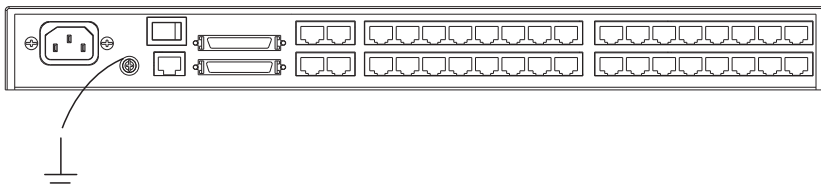
Single Stage Installation

In a Single Stage installation, there are no additional KVM switches daisy-chained or cascaded down from the first station. To set up a single stage installation, refer to the diagram on page 18 (the numbers in the diagrams correspond to the numbered steps) and do the following:

1. Connect 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 identifying icon.

2. Connect the console module to the KM0216 / KM0432.

   Use a Cat 5 patch cable to connect the *Link* port of the console module to one of the user ports on the KM0216 / KM0432's rear panel.

   Note: 1. The distance between the console module and the KM0216 / KM0432 must not exceed 150 m (500 feet).

   2. We strongly recommend that you use Category 5 shielded twisted pair (STP) cable.

   (Repeat Steps 1 and 2 for all consoles that you wish to connect.)

3. Connect the KVM adapter cable to the computer.

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

4. Connect the KVM adapter cable to the KM0216 / KM0432.

   Use a Cat 5 patch cable to connect a compatible KVM adapter cable to any available KVM port on the KM0216 / KM0432.

   Note: The distance between the KVM adapter cable and the KM0216 / KM0432 must not exceed 150 m (500 feet).

   (Repeat Steps 3 and 4 for all computers that you wish to connect.)

5. After all your computers have been cabled up, plug the female end of the power cord into the KM0216 / KM0432's power socket; plug the male end into an AC power source appropriate for the switch.

6. Connect the power adapter to the console module and to an AC power source appropriate for the device.

7. Turn on the power to the KM0216 / KM0432.

8. Turn on the power to the computers.

Single Stage Installation Diagrams

This product supports several console module and KVM adapter cable types. See *Requirements*, page 3, and *KVM Adapter Cable Installation Diagrams*, page 20, for details.

Console Module
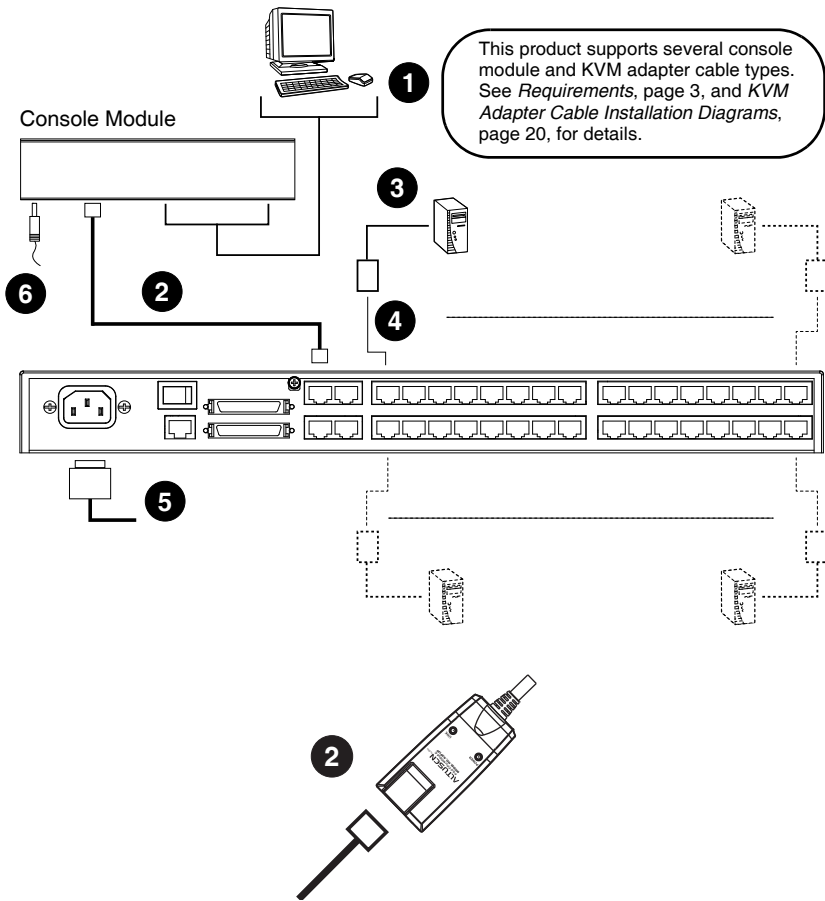
Console Installation Diagrams

KA9222
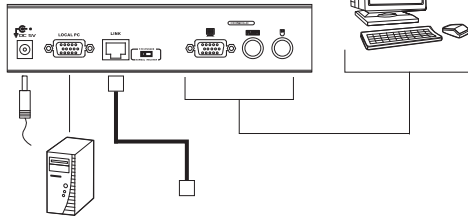
KA9272

KVM Adapter Cable Installation Diagrams

KA9120

KA9130

KA9131

KA9140

KA9170
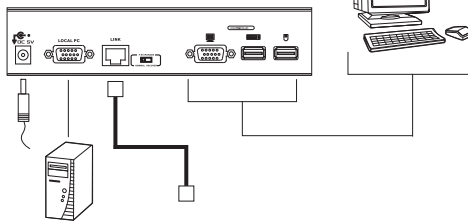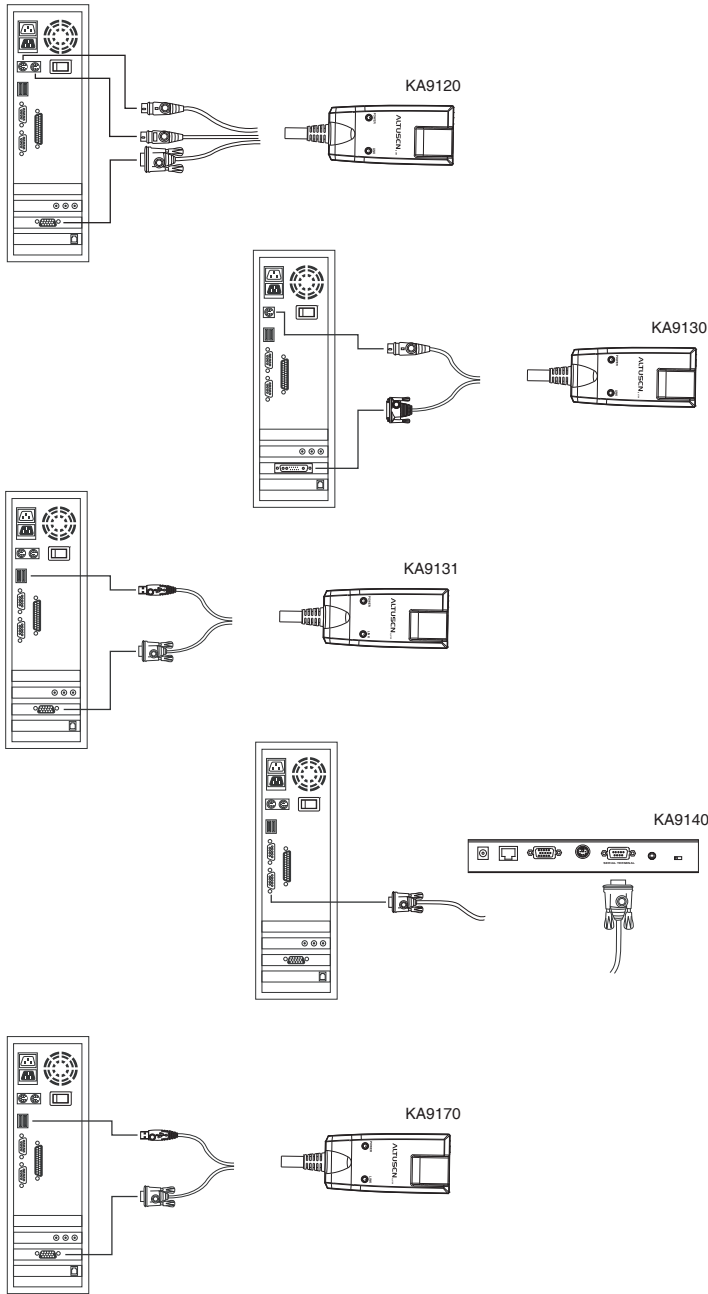
Multilevel Installations

The number of computers that can be added to your installation can be greatly expanded by performing a multilevel installation. The KM0216 / 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 page 23), similar to the way children make chains of daisies by tying the end of one daisy to the head of another.

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

Cascading involves using the KVM 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 KVM port for each cascaded KVM.

The KM0216 / KM0432 supports both daisy-chaining and cascading. In addition, it supports combining the two – providing enormous capacity and flexibility for expanding an installation. The following sections provide information and procedures involved in setting up the various multilevel installations.

Daisy-chaining

Up to 7 additional KM0216 / KM0432 units can be daisy-chained from the first; each capable of supporting four independent consoles. The first KM0216 / KM0432 is considered the *Master* unit; the daisy-chained KM0216 / KM0432 switches are considered *Slaves*.

In a complete daisy-chained installation, the two (KM0216) or four (KM0432) consoles that belong to the Master switch can access and control all of the

computers (up to 128 or 256) on the installation. The consoles belonging to each Slave switch only control the computers connected to the switch on the same level (see *Computer Connection Tables*, page 69, for tables showing the relation between the number of computers and the number of switches needed to control them.)
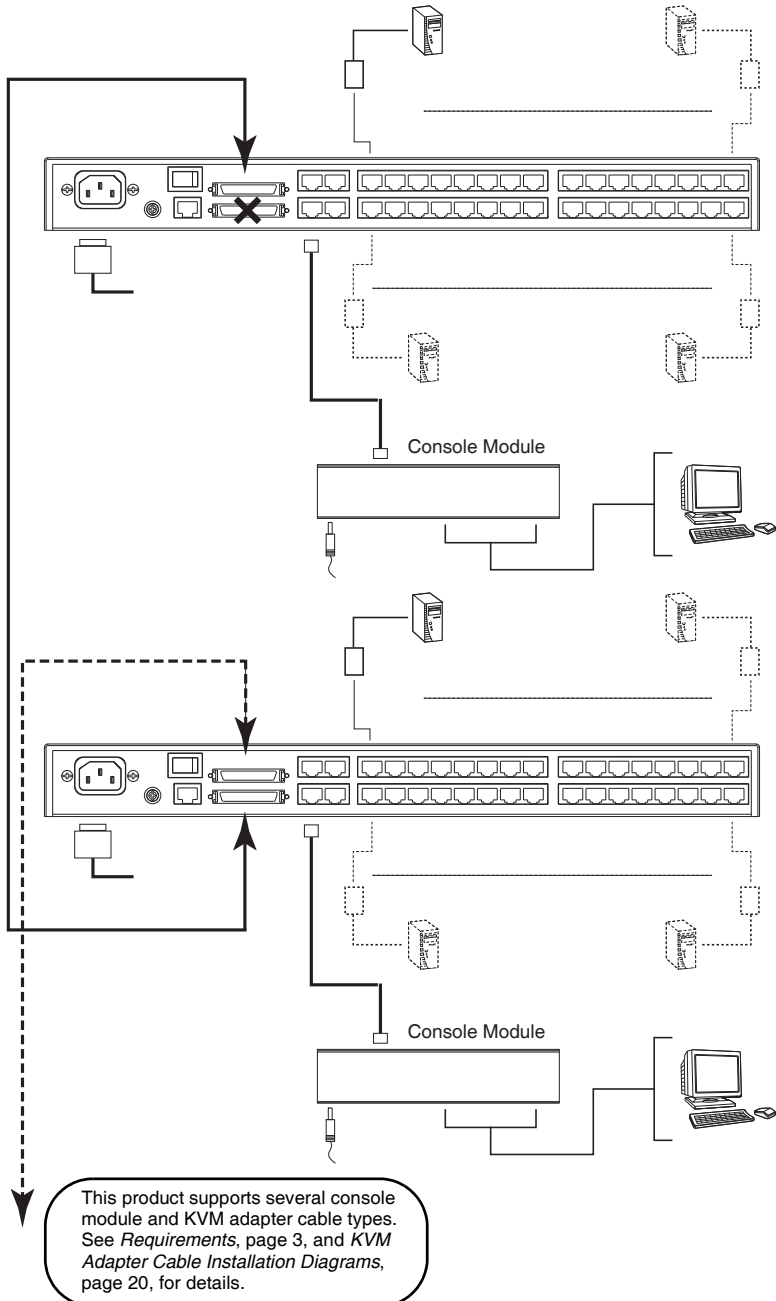
To set up a daisy-chained installation, refer to the diagram on page 23 and do the following:

1. Power down the target device(s) that will be part of your matrix KVM switch installation.

2. Use a daisy-chain cable set (see *Cables*, page 4) to connect the *Chain Out* port of the master KM0216 / KM0432 unit to the *Chain In* port of the slave KM0216 / KM0432 unit (first station chain out to second station chain in, second station chain out to third station chain in, etc.).

> **Note:** You cannot use the *Chain In* port of the First Station KM0216 / KM0432, since it is the *Master* unit.

3. If you wish to install any consoles on this switch, follow the procedure described for the *Single Stage Installation* on page 16.

4. Use KVM adapter cables (see *Cables*, page 4) to connect any available KVM port on the KM0216 / KM0432 to the keyboard, video and mouse ports of the computers you are installing.

   (Repeat the above steps for any additional KM0216 / KM0432 units you wish to add to the chain.)

5. Plug the power cord into an AC power source and into the KM0216 / KM0432's power socket.

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

   a) Switch on the power for the First Station (*Master* unit). 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.

Daisy-chained Installation Diagram

Console Module

Console Module

This product supports several console
module and KVM adapter cable types.
See *Requirements*, page 3, and *KVM
Adapter Cable Installation Diagrams*,
page 20, for details.

Cascading

Another way to expand your KVM installation is to cascade additional KVM switches from the KVM ports of the KM0216 / KM0432. Up to 16 (KM0216) or 32 (KM0432) additional KVM switches can be cascaded. As many as 128 (KM0216) or 256 (KM0432) computers can be controlled in a cascaded installation. 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 multiple KM0216 / KM0432 Matrix KVM Switches, you cannot cascade them.

2. The KM0216 / KM0432 cannot cascade KVM switches beyond the second level.

In a cascaded installation, the KM0216 / KM0432 is considered the *First Stage* unit; cascaded KVM switches are considered *Second Stage* units.

Compatible KVM switches that use the same data transfer protocol as the first stage KM0216 / KM0432 allow all of the separate switch OSDs to be integrated so that when the KM0216 / KM0432 consoles bring up the OSD, it lists all of the computers connected to all of the units. In a full cascade, 128 or 256 computers can be controlled from a single KM0216 / KM0432.

Note: The KVM switch shown in the installation diagram is the KH88. See *Supported KVM Switches*, page 68, for a list of KVM switches that can be cascaded from the KM0216 / KM0432.

To set up a cascaded installation, refer to the installation diagram on page 25 and do the following:

1. Power down the target device(s) that will be part of your matrix KVM switch installation.

2. Use Cat 5 cable to connect any available KVM port on the First Stage unit (the KM0216 / KM0432) to a PS/2 style KVM adapter cable (see *Cables*, page 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 KM0216 / KM0432 must not exceed 150 m (500 feet).

3. Use KVM cable sets (as described in the *Cables* section of the cascaded KVM switch's user manual) to connect any available KVM 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 cord into the unit's power socket; then plug it into an AC source.

5. Repeat this procedure for any additional Second Stage units you are installing.

6. Power on the KM0216 / KM0432, then power on the Second Stage unit(s).

7. After all the KVM switches are powered on, then power on the attached computers.

Cascaded Installation Diagram

This product supports several console module and KVM adapter cable types. See *Requirements*, page 3, and *KVM Adapter Cable Installation Diagrams*, page 20, for details.

Console Module

KM0432

KA9120
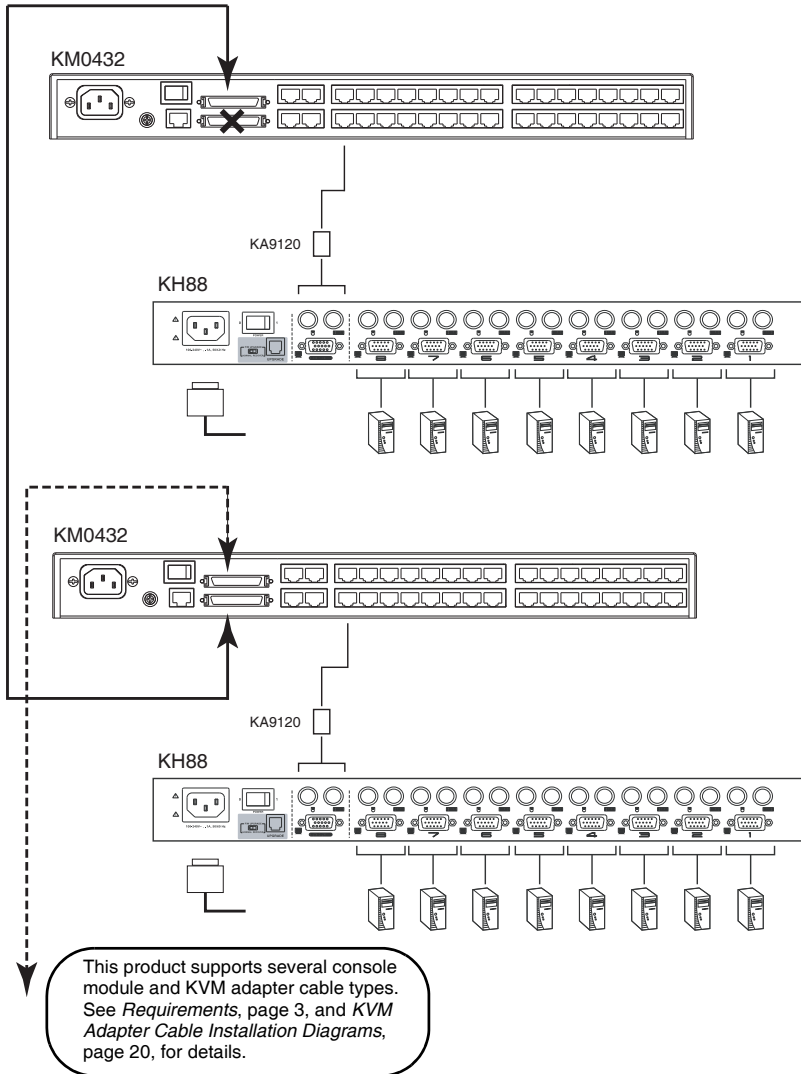
KH88
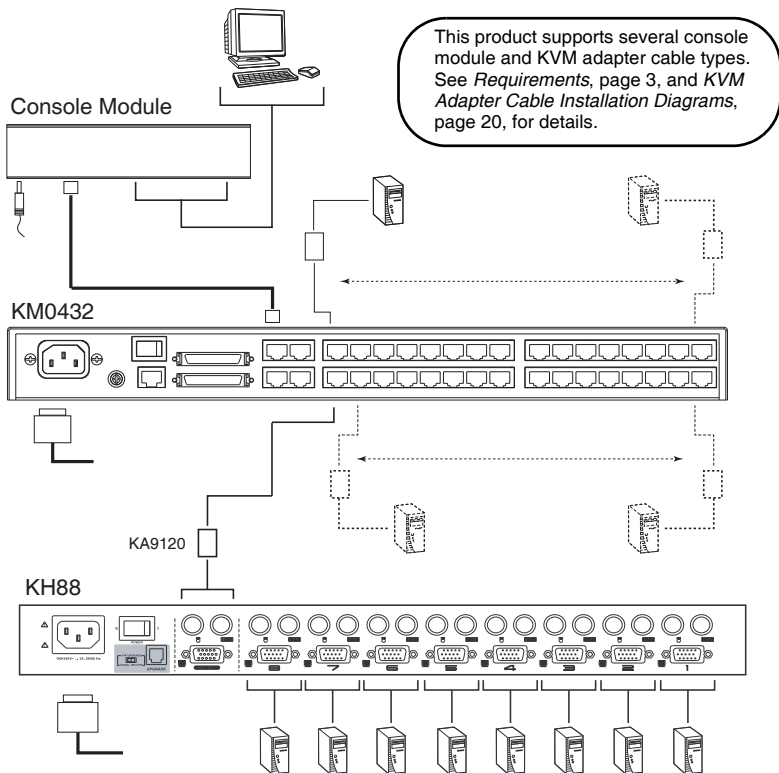
Daisy-chaining Plus Cascading Expansion

The expansion methods previously described for daisy-chain and cascade installations can be combined to produce extremely large KVM installations. Up to 8 daisy-chained KM0216 / KM0432 Matrix KVM Switches can cascade one compatible KVM switch from each port, allowing up to 1,024 or 2,048 computers and 32 consoles in a full installation (8 x 16 x 8 or 8 x 32 x 8). See *Supported KVM Switches*, page 68, for a list of compatible KVM switches.

The two or four consoles belonging to the master KM0216 / KM0432 Matrix KVM Switch can access and control all of the ports on all of the switches on the entire installation. The two or 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.

To set up a daisy-chained and cascaded installation, refer to the diagram on page 27 and do the following:

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

2. Power on the daisy-chained KM0216 / KM0432 Stations according to the sequence given in the *Daisy-chaining* section (see page 21).

3. After all the daisy-chained KM0216 / KM0432 Stations are powered on, then power on the cascaded Stations.

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

Daisy-chained/Cascaded Installation Diagram

KM0432

KA9120

KH88

KM0432

KA9120

KH88

This product supports several console module and KVM adapter cable types. See *Requirements*, page 3, and *KVM Adapter Cable Installation Diagrams*, page 20, for details.

Topology Considerations

The use of RJ-45 port 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 KM0216 / KM0432 installation to take advantage of the internal Cat 5e and Cat 6 wiring built into most modern commercial buildings.

Note: Although the KM0216 / KM0432 supports legacy Cat 5 wiring, the performance and video quality may degrade over longer distances.

Since the data signals are not transmitted in packets, the transmission cannot 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 KM0216 / 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 button on the KM0216 / KM0432's front panel (see *Reset Button*, page 7, for details). If this doesn't resolve the problem, restart the computers that have the problem.

Powering Off and Restarting

Powering off the KM0216 / KM0432 does not affect the computers attached to it. When you restart the KM0216 / KM0432, you will regain control immediately. To replace a KM0216 / 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 means of the KM0216 / KM0432's OSD (On Screen Display), or by entering Hotkey combinations from the keyboard. *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 KVM port on a KM0216 / 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 have either 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 KM0216 / 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 Installations

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

- The Station Number of the KM0216 / KM0432

- The Port Number on the KM0216 / 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 6** of a KVM switch that is cascaded from **Port 15** of a KM0216 / KM0432 in the **Station 8** position, would have a Port ID of: **8-15-6**.

User Management and Security

The KM0216 / 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, two (KM0216) or four (KM0432) operators have simultaneous and independent control of 16 or 32 computers. In a daisy-chained installation, a maximum of 16 or 32 operators can access the chain simultaneously (8 KM0216s x 2 operators each; or 8 KM0432s x 4 operators each). Each *Slave* KM0216 / KM0432 also has 6 operator profiles, as above.

Note: 1. When a Super Administrator logs in on a Slave unit his authority only governs the segment he logs in on – just like an ordinary Administrator.

2. Operator *profiles* are different from actual operators. The KM0216 / KM0432 has two / four console ports and allows two or 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 the 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*, page 42, and *SET ACCESSIBLE PORTS*, page 44).

The Administrator's power is limited to only that segment of the installation that the KM0216 / 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 KM0216 / 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 page 45).

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 KM0216 / KM0432 they are logged in on.
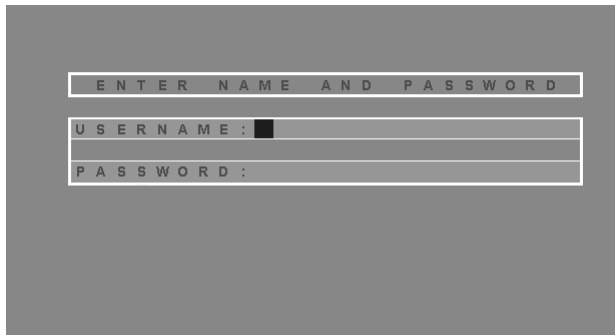
OSD Overview

The KM0216 / 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 **[Scroll Lock]** twice.

Note: [Scroll Lock] is the default OSD hotkey. You can optionally change the Hotkey to the Ctrl key (see *OSD HOTKEY*, page 40, for details).
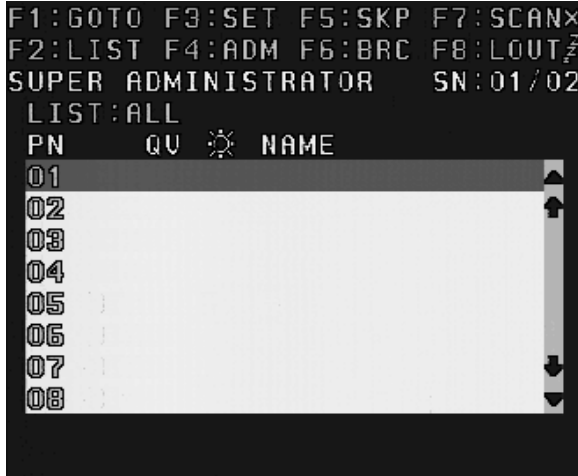
The login dialog box appears:

```
        E N T E R    N A M E    A N D    P A S S W O R D

  U S E R N A M E : █

  P A S S W O R D :
```

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.

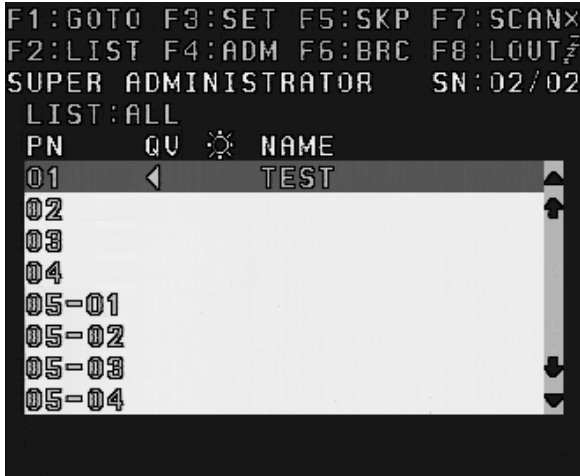After you log in, a screen similar to the one below appears:

```
F1:GOTO F3:SET F5:SKP F7:SCAN×
F2:LIST F4:ADM F6:BRC F8:LOUT⇕
SUPER ADMINISTRATOR    SN:01/02
 LIST:ALL
 PN    QV ☼ NAME
 01
 02
 03
 04
 05
 06
 07
 08
```

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 Administrators 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*, page 44, for details).

Single Stage Installation
In a single stage installation there are no additional switches cascaded or daisy-chained from the KM0216 / KM0432. The port list will show all the ports of the KM0216 / KM0432.
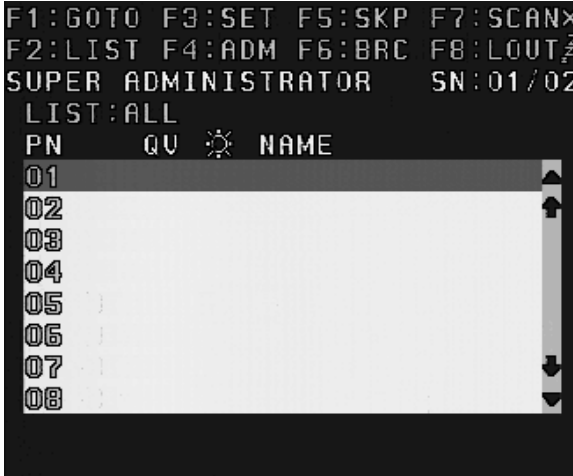
Cascaded Installation

In a cascaded installation, the default port list will show every port, including those from cascaded switches connected to the KM0216 / KM0432. Any switches or computers added to, disconnected from or rearranged in the installation will be detected and the port list will be automatically updated.

```
F1:GOTO F3:SET F5:SKP F7:SCAN×
F2:LIST F4:ADM F6:BRC F8:LOUT
SUPER ADMINISTRATOR   SN:02/02
 LIST:ALL
 PN     QV ☼ NAME
 01       ◄     TEST
 02
 03
 04
 05-01
 05-02
 05-03
 05-04
```

Daisy-chain Installation

In a daisy-chain installation, the port list shows the ports of the currently selected station. Any computers added to, disconnected from or rearranged in the installation will be detected and the port list will be automatically updated.

To list the ports of another daisy-chained switch in the installation, use the F1 GOTO function (see page 38) to select the other station.

Note: When listing the ports of a daisy-chain switch, the ports from any cascaded switches connected to the daisy-chain switch will also be shown in the list, see *Cascaded Installation* on page 35.

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. The simplest method to access a particular computer is move the highlight bar to it, then press **[Enter]**.
QV	If a port has been selected for Quick View scanning (see *SET QUICK VIEW PORTS*, page 44), an arrowhead displays in this column.
☼	The computers that are powered on and are On Line have a sun icon in this column.
NAME	If a port has been given a name (see *EDIT PORT NAMES*, page 43), 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, press **[F8]**, or click **F8** on the OSD menu.

- 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 Page Up and Page Down keys on the keyboard. If there are more list entries than there is room for on the Main Screen, the screen will scroll.

- To access a port, double click it, or move the highlight bar to it, and then press **[Enter]**.

- After performing any action, you automatically return to the previous menu.

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 KM0216 / KM0432's OSD operations are given in the sections that follow.

F1 GOTO

GOTO allows you to switch directly to a port or daisy-chained KVM either by keying in the port's *Name*, *Port ID* or *Station 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]**.

 To use the Station ID method, key in 3; key in the Station ID; then press **[Enter]** to go to another station on the daisy-chain installation (see *BUS AUTHORIZATION*, page 45). Only an authorized operator at the Master Station (the top level KM0216 / 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*, page 44), that match the Name or Port ID pattern, regardless of the current List settings (see *F2 LIST*, page 39, for details).

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

F2 LIST

This function lets you broaden or narrow the scope of which ports the OSD lists on the Main Screen. Many of the OSD functions only operate on the computers that are currently displayed (listed) on the Main Screen. The submenu choices and their meanings are given in the table below:

Choice	Meaning
ALL	Lists the ports on the installation. See *Single Stage Installation*, page 34, *Cascaded Installation*, page 35 and *Daisy-chain Installation*, page 36 for more information.
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*, page 44).
QVIEW + POWERED ON	Lists only the ports that have been selected as Quick View Ports (see *SET QUICK VIEW PORTS*, page 44), 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 is 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 *F8 LOUT*, page 47). If you shut down the KM0216 / 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.

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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*, page 47). 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*, page 46), and Auto Scan Mode (see *F7 SCAN*, page 47). Choices are:
	ALL − All the Ports which have been set Accessible (see *SET ACCESSIBLE PORTS*, page 44);
	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*, page 44);
	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*, page 44, 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.

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 *F8 LOUT*, page 47). If you shut down the KM0216 / 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 (disabled).

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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 Spacebar
	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 *OSD Factory Default Settings*, page 68) − except for the *Names* settings that were assigned to the Ports, which are saved.
CLEAR THE NAME LIST	This function clears all Port Names.
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*, page 47); or an invalid entry is made on an OSD menu. The default is Y (activated).

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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, click the port, or use the Navigation Keys to move the highlight bar to it, then press **[Spacebar]**.
	◆ 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*, page 39), 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*, page 41), 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.
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).

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Setting	Function
BUS AUTHORIZAT ION	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 KM0216 / 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.

F5 SKP

This function enables you to easily skip backward or forward – switching the console focus from the currently active KVM 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 page 41).

◆ 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 previous or next available computer that is in the *Scan/Skip Mode* selection (see *SCAN/SKIP MODE*, page 41).

◆ 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. In Broadcast Mode, commands are sent from the console to all computers, whether directly connected to the first stage Matrix KVM Switch or attached to a daisy-chained Matrix KVM Switch.

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.

◆ 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 manually.

 ◆ The selection of computers to be included for Auto Scanning is made with the *Scan/Skip Mode* setting under the **F3 SET** function (see *SCAN/SKIP MODE*, page 41).

 ◆ The amount of time that each Port displays for is set with the *Scan Duration* setting under the **F3 SET** function (see *SCAN DURATION*, page 41). 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 *Invoking Auto Scan*, page 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.

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Chapter 4
Keyboard Port 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 installations that combine daisy-chaining and cascading, it is simpler, more convenient, and more efficient to use the OSD.

The KM0216 / 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 involves the following three steps:

1. Press and hold down the **[Num Lock]** key.

2. Press the **[*]** (asterisk) key or the **[-]** (minus) key, and then release it within one-half second.

3. Release the **[Num Lock]** key.

    [Num Lock] + [*]

    -or-

    [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 KVM port is assigned a Port ID (see *Port ID Numbering*, page 30). You can directly access any computer on the installation with a Hotkey combination that specifies the Port ID of the KVM port that the computer is connected to. The steps involved are:

1. Invoke HKM (see page 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.

Auto Scanning

Auto Scan switches among all the KVM ports that are accessible to the current Operator at regular intervals (see *SCAN/SKIP MODE*, page 41, 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 *SCAN DURATION*, page 41). You can change the scan interval before activating Hotkey Auto Scanning, if you wish, with the following Hotkey combination:

1. Invoke HKM (see page 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.

Invoking Auto Scan

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

1. Invoke HKM (see page 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 page 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*, page 41, 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 [Num Lock] + [*] 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*, page 43) can be Hotkey toggled On and Off. To toggle the Beeper, key in the following Hotkey combination:

1. Invoke HKM (see page 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] + [*] or [Num Lock] + [-]	[Port ID] [Enter]	Switches the KVM focus 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, press [P] or left-click the mouse to pause Auto Scanning. When Auto Scanning is paused, press any key or left-click the mouse to resume Auto Scanning.
	[←]	Invokes Skip Mode and skips from the current port to the first previous accessible port.
	[→]	Invokes Skip Mode and skips from the current port to the next accessible port.
	[↑]	Invokes Skip Mode and skips from the current port to the last accessible port of the previous station.
	[↓]	Invokes Skip Mode and skips from the current port to the first accessible port of the next station.
	[B]	Toggles the beeper on or off.

Chapter 5
Keyboard Emulation

Mac Keyboard

The PC compatible (101/104 key) keyboard can emulate the functions of the Mac keyboard. The emulation mappings are listed in the table below.

PC Keyboard	Mac Keyboard
[Shift]	Shift
[Ctrl]	Ctrl
⊞	⌘
[Ctrl] [1]	🔇
[Ctrl] [2]	🔉
[Ctrl] [3]	🔊
[Ctrl] [4]	⏏
[Alt]	Alt
[Print Screen]	F13
[Scroll Lock]	F14
📑	=
[Enter]	Return
[Backspace]	Delete
[Insert]	Help
[Ctrl] ⊞	F15

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

Sun Keyboard

The PC compatible (101/104 key) keyboard can emulate the functions of the Sun keyboard when the Control key [Ctrl] is used in conjunction with other keys. The corresponding functions are shown in the table below.

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
📝	Compose
⊞	u

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

The Firmware Upgrade Utility

Introduction

The purpose of the Windows-based Firmware Upgrade Utility (FWUpgrade.exe) is to provide an automated process for upgrading the KVM switch's firmware as easy 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 Website. Check the Website 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 KM0216 / 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.

(Continued from previous page.)
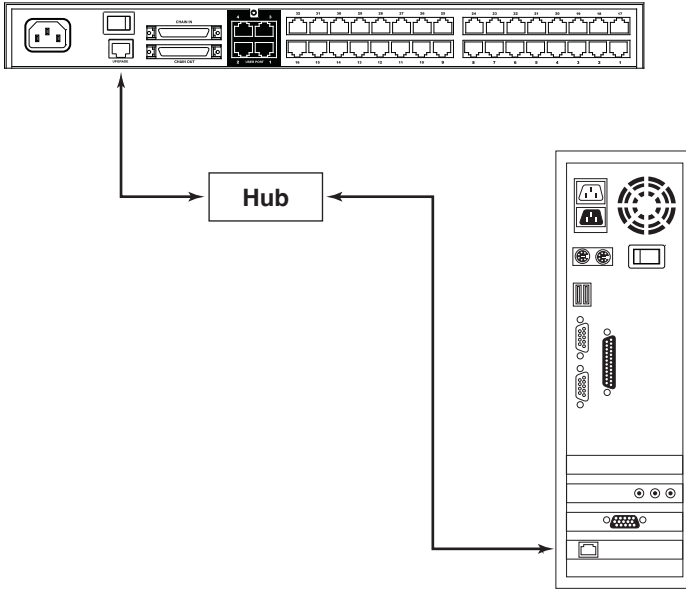
4. Shut down all of the computers – but not the stations – on your KVM installation.

5. From the console of your KVM switch, bring up the OSD (see page 33) and select the **F4 ADM** function.

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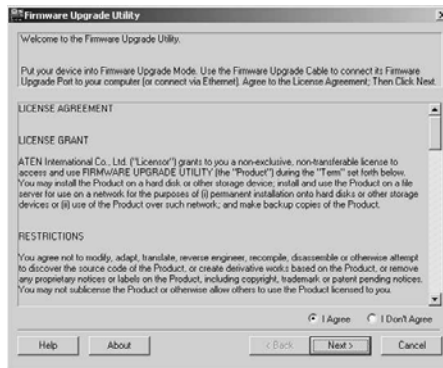
Performing the Upgrade

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:
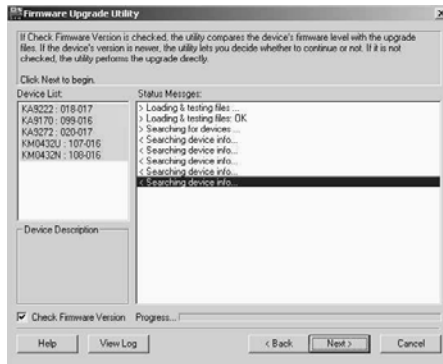
(Continues on next page.)

(Continued from previous page.)

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 upgrade.

2. KM0432U and KM0432N refer to two different upgradable ICs on the chained KM0432 devices.

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

---

4. When all devices to be upgraded are displayed in the Device List panel, 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.
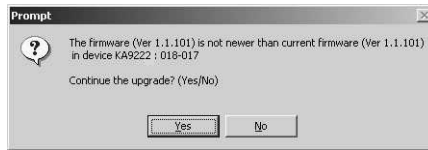

   If you didn't enable *Check Firmware Upgrade*, the Utility installs the upgrade files without checking their version level.

   ◆ 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.
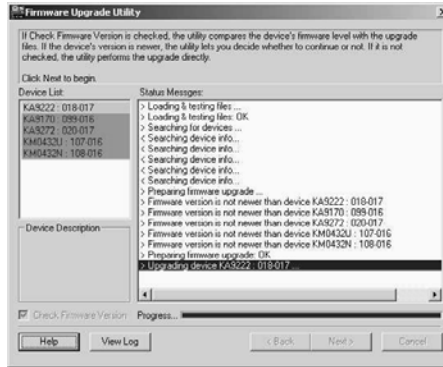
◆ As each device update completes, its status is reported in the *Status Messages* panel.

◆ 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.
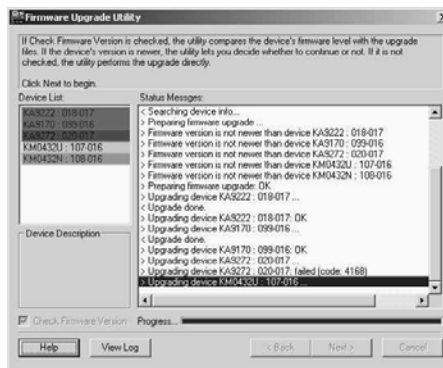
5. When all devices have been upgraded, click **Finish** to close the Firmware Upgrade Utility.

Upgrade Failed

If a member of a device group fails to complete the upgrade successfully:

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

2. Start the firmware upgrade procedure again (see page 59).

3. When the Device List is complete, click on the device group that the failed device belongs to in the Device List panel (see page 59).

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

Firmware Upgrade Recovery

If the firmware upgrade procedure is unnaturally aborted (due to a power outage, for example), the switch that was being upgraded at the time may become inoperable, and may be incapable of accepting a normal firmware upgrade.

If this occurs, to recover, do the following:

1. Slide the unit's *Firmware Upgrade Recovery Switch* (see page 7), to the RECOVER position.

2. Perform a warm reset (see *Reset Button*, page 7).

    The switch is now ready to be upgraded.

3. Slide the Recovery Switch back to the NORMAL position.

4. Start the firmware upgrade procedure again (see page 59).

Appendix

Safety Instructions

General

- Read all of these instructions. Save them for future reference.

- Follow all warnings and instructions marked on the device.

- Do not place the device on any unstable surface (cart, stand, table, etc.). If the device falls, serious damage will result.

- Do not use the device near water.

- Do not place the device near, or over, radiators or heat registers.

- The device cabinet is provided with slots and openings to allow for adequate ventilation. To ensure reliable operation, and to protect against overheating, these openings must never be blocked or covered.

- The device should never be placed on a soft surface (bed, sofa, rug, etc.) as this will block its ventilation openings. Likewise, the device should not be placed in a built in enclosure unless adequate ventilation has been provided.

- Never spill liquid of any kind on the device.

- Unplug the device from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.

- The device should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

- The device is designed for IT power distribution systems with 230V phase-to-phase voltage.

- The device is equipped with a 3-wire grounding type plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not attempt to defeat the purpose of the grounding-type plug. Always follow your local/national wiring codes.

- Do not allow anything to rest on the power cord or cables. Route the power cord and cables so that they cannot be stepped on or tripped over.

- If an extension cord is used with this device make sure that the total of the ampere ratings of all products used on this cord does not exceed the

extension cord ampere rating. Make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

◆ To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).

◆ Position system cables and power cables carefully; Be sure that nothing rests on any cables.

◆ Never push objects of any kind into or through cabinet slots. They may touch dangerous voltage points or short out parts resulting in a risk of fire or electrical shock.

◆ Do not attempt to service the device yourself. Refer all servicing to qualified service personnel.

◆ If the following conditions occur, unplug the device from the wall outlet and bring it to qualified service personnel for repair.

   ◆ The power cord or plug has become damaged or frayed.

   ◆ Liquid has been spilled into the device.

   ◆ The device has been exposed to rain or water.

   ◆ The device has been dropped, or the cabinet has been damaged.

   ◆ The device exhibits a distinct change in performance, indicating a need for service.

   ◆ The device does not operate normally when the operating instructions are followed.

◆ Only adjust those controls that are covered in the operating instructions. Improper adjustment of other controls may result in damage that will require extensive work by a qualified technician to repair.

◆ Do not connect the RJ-11 connector marked "UPGRADE" to a public telecommunication network.

Rack Mounting

- Before working on the rack, make sure that the stabilizers are secured to the rack, extended to the floor, and that the full weight of the rack rests on the floor. Install front and side stabilizers on a single rack or front stabilizers for joined multiple racks before working on the rack.

- Always load the rack from the bottom up, and load the heaviest item in the rack first.

- Make sure that the rack is level and stable before extending a device from the rack.

- Use caution when pressing the device rail release latches and sliding a device into or out of a rack; the slide rails can pinch your fingers.

- After a device is inserted into the rack, carefully extend the rail into a locking position, and then slide the device into the rack.

- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating.

- Ensure that proper airflow is provided to devices in the rack.

- Do not step on or stand on any device when servicing other devices in a rack.

Technical Support

Technical support is available both by email and online (with a browser over the web):

International

Email Support		support@aten.com
Online Support	Technical Support	http://support.aten.com
	Troubleshooting Documentation Software Updates	http://www.aten.com
Telephone Support		886-2-8692-6959

North America

Email Support		ATEN TECH	support@aten-usa.com
		ATEN NJ	sales@aten.com
Online Support	Technical Support	ATEN TECH	http://www.aten-usa.com/support
		ATEN NJ	http://support.aten.com
	Troubleshooting Documentation Software Updates	ATEN TECH	http://www.aten-usa.com
		ATEN NJ	http://www.aten.com
Telephone Support		ATEN TECH	1-888-999-ATEN
		ATEN NJ	1-732-356-1703

When you contact us, 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.

Specifications

Function		KM0216	KM0432
Computer Connections	Direct	16	32
	Max.	128 (via 8 level Daisy-chain) 128 (via 2 level Cascade) 1,024 (via 8 level Daisy-chain + 2 level Cascade)	256 (via 8 level Daisy-chain) 256 (via 2 level Cascade) 2,048 (via 8 level Daisy-chain + 2 level Cascade)
Console Connections		2 Direct; 16 Max. (via Daisy-chain)	4 Direct; 32 Max. (via Daisy-chain)
Port Selection		OSD; Hotkey	
Connectors	Console Port	2 x RJ-45 Female	4 x RJ-45 Female
	KVM Port	16 x RJ-45 Female	32 x RJ-45 Female
	Daisy-chain Port	In	1 x HPDB-50 Female (Black)
		Out	1 x HPDB-50 Female (Black)
	F/W Upgrade	1 x RJ-45 Female	
	Power	1 x 3-prong AC Socket	
Switches	Reset	1 x Semi-recessed Pushbutton	
	Power	1 x Rocker	
	F/W Upgrade	1 x Slide	
LEDs	On Line/Selected	16 dual-colored (Green/Red)	32 dual-colored (Green/Red)
	Power	1 (Blue)	
	Station ID	2 x 7-segment (Yellow)	
Emulation	Keyboard/Mouse	PS/2; USB (PC, Sun, Mac); Sun legacy; serial	
Video		1024 x 768 @ 60Hz (150m max.); DDC2B	
Scan Interval		1–255 Seconds	
I/P Rating		100–240V, 50/60Hz; 1A	
Power Consumption		120V/13.9W; 230V/13.9W	
Environment	Operating Temp.	0–50º C	
	Storage Temp.	-20–60º C	
	Humidity	0–80% RH, Non-condensing	
Physical Properties	Housing	Metal	
	Weight	4.2 kg	4.6 kg
	Dimensions (L x W x H)	43.8 x 28.4 x 4.4 cm	

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
Keyboard Language	US English
Operating Platform	Windows (PC compatible)
Bus Authorization	Blank—No Operators have access rights

Supported KVM Switches

The following is a list of supported KVM switches that can be used when configuring a cascaded installation.

◆ KH88

◆ CS-88A

◆ CS-138A

◆ CS-9134

◆ CS-9138

Computer Connection Tables

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

<u>KM0216 Daisy-chain</u>

KM0216s	Computers
1	1–16
2	17–32
3	33–48
4	49–64
5	65–80
6	81–96
7	97–112
8	113–128

<u>KM0216 Cascade to KH88</u>

KVMs	Computers	KVMs	Computers
1	16–23	9	72–79
2	23–30	10	79–86
3	30–37	11	86–93
4	37–44	12	93–100
5	44–51	13	100–107
6	51–58	14	107–114
7	58–65	15	114–121
8	65–72	16	121–128

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 KH88

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

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 Matrix KVM Switch and remove the power cord from the power socket.

2. Remove the cover from the Matrix KVM Switch.

3. Using a jumper cap, short the jumper labeled J6 on the mainboard.
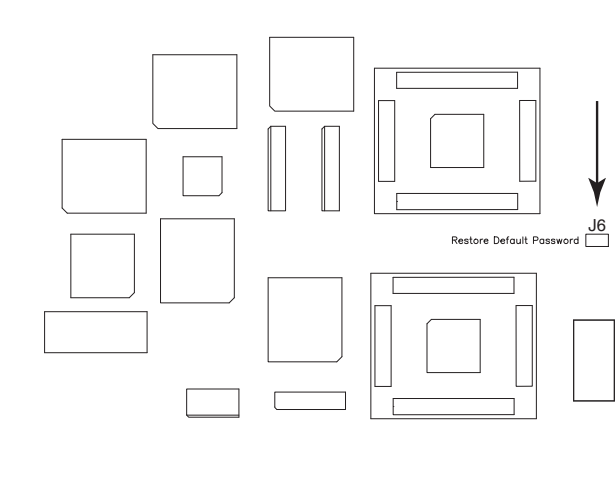
4. Replace the power cord and power on the Matrix KVM Switch. The following message appears on the LCD display:

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

5. Power off the Matrix KVM Switch and remove the power cord from the power socket again.

6. Remove the jumper cap from the jumper.

7. Replace the cover on the switch. Replace the power cord and power on the KVM switch.

8. The OSD login information is cleared (see page 33) and you can reset passwords for the Administrators and Users.

KA9140 RS-232 Connector Pin Assignments

The following table lists the pin assignments for the KA9140 D-sub 9-pin RS-232 connector.

Pin	Description
1	-
2	TXD
3	RXD
4	-
5	GND
6	DTR (+10V)
7	CTS
8	RTS (+10V)
9	-

Troubleshooting

Problem	Solution
The operator can only access one port on a cascaded KVM switch and cannot switch to any of the other ports.	There is only one display channel for all the ports on a cascaded KVM switch. The previous operator's access timeout expired (see *SET ACCESS TIMEOUT*, page 44), 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 *SET LOGOUT TIMEOUT*, page 42) for all users.
When I emulate the Sun keyboard, I can't go into OK Mode ([Stop] [A]).	To go into OK Mode, use the following key sequence: 1. Press and release **[Ctrl]**. 2. Press and hold **[T]**. 3. Press and hold **[A]**. 4. Release **[T]** and **[A]** together.
Some computers on my installation don't seem to receive Broadcast Mode commands.	Broadcast Mode commands are sent from the console to all computers, whether directly connected to the first stage Matrix KVM Switch or attached to a daisy-chained Matrix KVM Switch. (Broadcast Mode commands are not sent to computers attached to cascaded KVM switches.) Additionally, Broadcast Mode commands for one operating system may not be recognized by another operating system.

Sun Systems

Problem	Solution

Video display problems with HDB-15 interface systems (e.g. Sun Blade 1000 servers).	The display resolution should be set to 1024 x 768 @ 60Hz.
	
	Under Text Mode:
	1. Go to **OK mode** and issue the following commands:
	
	```setenv output-device screen:r1024x768x60```
	```reset-all```
	
	Under XWindow:
	1. Open a console and issue the following command:
	
	```m64config -res 1024x768x60```
	
	2. Log out.
	3. Log in.

Video display problems with 13W3 interface systems (e.g. Sun Ultra servers).*	The display resolution should be set to 1024 x 768 @ 60Hz.
	
	Under Text Mode:
	1. Go to **OK mode** and issue the following commands:
	
	```setenv output-device screen:r1024x768x60```
	```reset-all```
	
	Under XWindow:
	1. Open a console and issue the following command:
	
	```ffbconfig -res 1024x768x60```
	
	2. Log out.
	3. Log in.

* These solutions work for most common Sun VGA cards. If these procedures fail to resolve the problem, consult the manual for the Sun VGA card.

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ALTUSEN warrants this product against defects in material or workmanship for a period of one (1) year from the date of purchase. If this product proves to be defective, contact ALTUSEN's support department for repair or replacement of your unit. ALTUSEN will not issue a refund. Return requests can not be processed without the original proof of purchase.

When returning the product, you must ship the product in its original packaging or packaging that gives an equal degree of protection. Include your proof of purchase in the packaging and the RMA number clearly marked on the outside of the package.

This warranty becomes invalid if the factory-supplied serial number has been removed or altered on the product.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence or modification of any part of the product. This warranty does not cover damage due to improper operation or maintenance, connection to improper equipment, or attempted repair by anyone other than ALTUSEN. This warranty does not cover products sold AS IS or WITH FAULTS.

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