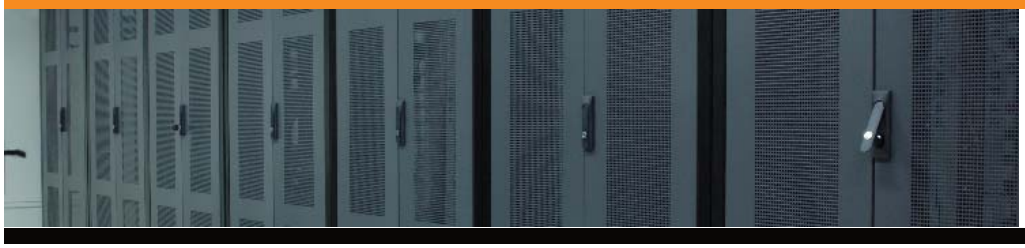
ALTUSEN™
Enterprise KVM Solutions by ATEN

www.aten.com



ATEN®
Simply Better Connections™

Application Guide

Matrix KVM Solution for Data Centers

Data Center Management

Concurrent with developments in Information Technology and Network Infrastructure, more and more computers are being utilized for data storage and information processing. With an increasing number of servers performing increasingly complex administrative tasks, it has become an absolute necessity to consolidate all the servers in a data center or server room so they can be centrally managed. Security is a major concern for a data center, and one of the benefits of a centralized server room is that all of the servers are located in a common area, making cooling and security easier to implement.

Due to the recent economic downturn and the uncertainty that has resulted from it, maximizing technology investments has become an important goal for most companies. Since a modern data center may require a constant increase in systems that provide control, flexibility and scalability, the data center is under increased pressure to maximize efficiency and flexibility while minimizing costs. Therefore, it is critical to your company's future profitability to choose a solution that ensures your initial investment will reap a reward – one that offers flexible scalability to match your company's growth, and reduces your Mean-Time-To-Repair (MTTR) while leveraging the existing IT resources you already have.

An intuitive, user-friendly, User Interface is also a necessity in a data center where operators spend a good deal of their time interacting with the servers. Since the administration tasks in a data center have become increasingly complex and varied, a new solution that offered powerful and comprehensive management functions that increased overall efficiency would be a great benefit. In addition, it would have to provide excellent video quality – which is of major concern in a data center where the consoles are located in a Network Operating Center (NOC) at some distance from the server room.

Mission

For a data center deployment, ATEN's mission is to provide an efficient solution which enables multiple consoles to control multiple servers. Since there are so many servers and other IT devices running on so many different platforms in a data center, multiplatform support and serial device compatibility are key functionality requirements. To maximize the value of a company's original equipment investment, providing flexible expansion forward without sacrificing what has come before, is another of ATEN's challenges in developing this solution. In addition, security is always of major concern for a data center. Providing an uncluttered, efficient cabling installation for such a large area as well as ensuring secure connections is another absolute requirement. Given the size of such a deployment, ATEN also realizes that several operators working on the system at the same time, will need a means of avoiding access and control conflicts – offering various operation modes (such as Exclusive, Occupy, and Share), is a way of resolving this problem. Finally, maintaining video quality over extended distance transmissions and offering real-time video sessions in order to provide operators who spend long hours working on the servers with the best video environment possible constitute two more important issues.

Solution

Multiple Control, Ultimate Security

Matrix KVM Switch

KM0532/KM0932 5/9-Console 32-Port Matrix KVM Switch

KM0032 32-Port Matrix Expansion KVM Switch

ATEN Matrix KVM Switches are designed for modern data centers that require reliable, high security access and control of multiple servers. With non-blocked access and flexible expansion support, Matrix KVM switches offer high quality video sessions for secure, real-time control of your entire data center devices.

With automatic skew compensation and Auto Signal Compensation (ASC) techniques, Matrix KVM switches provide greatly enhanced video quality via Cat 5e/6 cabling – 1280x1024 @60Hz for up to 300 meters. The industry's first full screen Graphical User Interface offers a tree view list of installed devices – providing smooth navigation and convenient access and control – not only saving on training time and costs; but increasing user efficiency, as well.

The KM0932/KM0532 is the first Matrix KVM Switch to offer both audio and virtual media features. Being audio enabled, the sound output and beeps from the servers allow administrators to identify and troubleshoot system problems easily. The sound capability is also ideal for presentation facilities, or studio applications. The Virtual Media function allows USB storage devices to be shared among all the servers – allowing operators to perform file transfers or install applications and OS patches from a single console – reducing down-time and saving maintenance costs.

Servers can be power controlled remotely when the Matrix KVM Switch is used in conjunction with ALTUSEN's PN0108 Power Over the NET™ power management device. Its Power Association function enables the switch's KVM ports to be associated with a PN0108's power outlets – allowing power management of the server attached to the port from the switch's interface. If a server has a dual power supply, secondary power association support lets you associate a second outlet port and synchronize the operation for both power supplies.

The Matrix KVM switch is designed with dual power supplies, to minimize downtime and offer 24/7 reliability to ensure the highest level of availability for your server room or data date center. With high availability, high reliability, high integration, and high security, an ATEN Matrix KVM Switch is the best solution for large server rooms and data centers.

>> Console Modules & KVM Adapter Cables

The Matrix KVM Switch's modular design – using console modules to link the console devices (keyboards, monitors, and mice) to the switch, and KVM Adapter Cables to link the switch to the servers – allows for a high degree of platform and interface integration. You can have PS/2 and USB interfaces; Win, Linux, Mac, and Sun platforms; all working together smoothly on the same installation. The use of RJ-45 connectors and Cat 5e/6 cabling eliminates bulky traditional cables, and makes for more reliable throughput and a neat, efficient, uncluttered work environment.

Console Modules

KA7230

PS/2-USB Console Module

- PS/2 and USB interface
- RS-232 Port
- Dual RJ-45 Ports
- External PC Port

KA7240

Virtual Media PS/2-USB Console Module

- PS/2 and USB interface
- RS-232 Port
- Dual RJ-45 Ports
- External PC Port
- Virtual Media Port
- Audio Ports
- Automatic Skew Compensation

KVM Adapter Cables

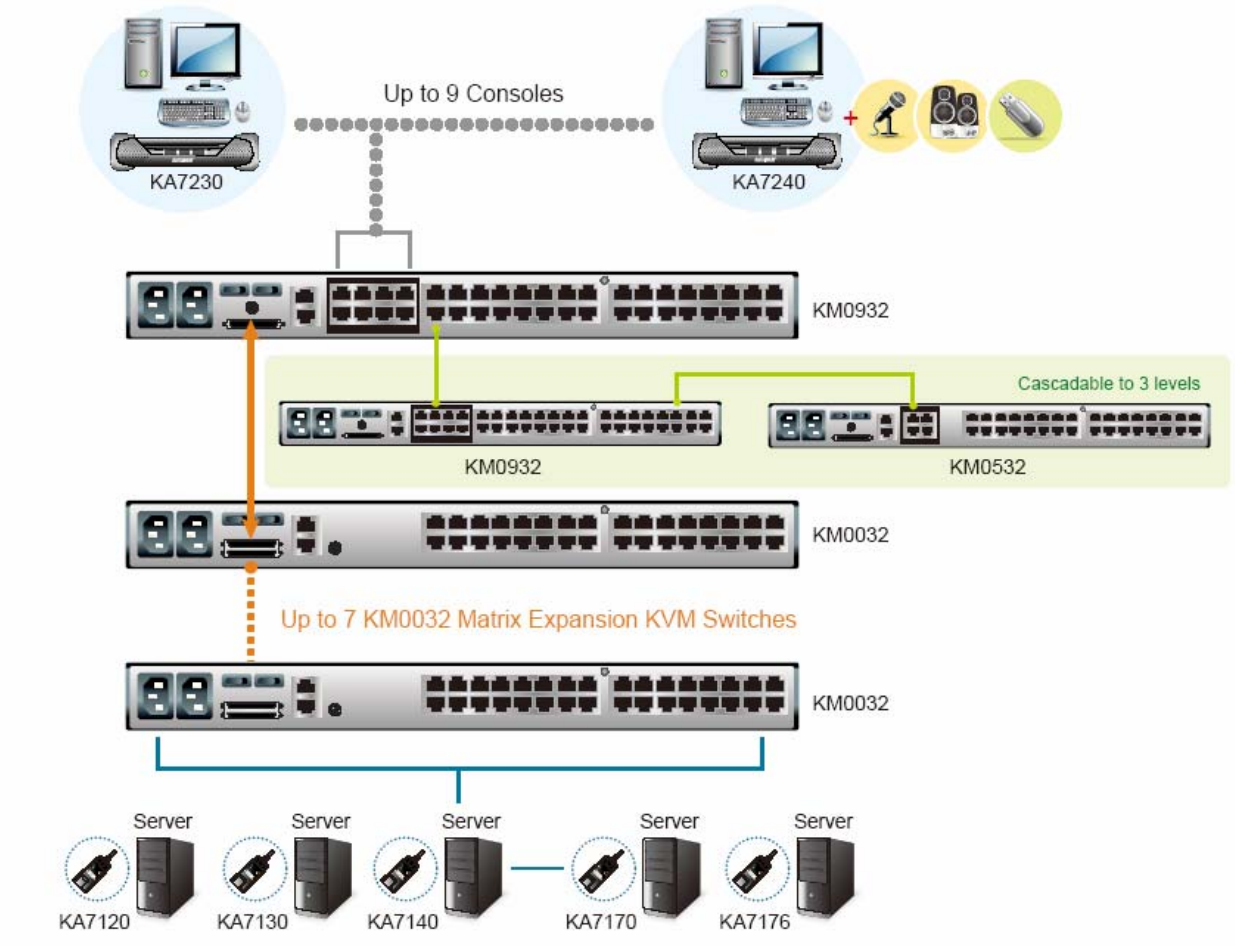
Function	Model Number
For PS/2 computers	KA7120, KA9120
For Sun legacy computers	KA7130, KA9130
For serial devices	KA7140, KA9140
For USB computers (including Sun and Mac)	KA7170, KA9170
For USB computers – Virtual Media and Audio support	KA7176

Application

Daisy Chain Configuration

>> Flexible Scalability, Cost Effectiveness

In a Daisy Chain Configuration, up to 7 KM0032 Matrix Expansion KVM Switches can be daisy chained from the first level (root) KM0932/KM0532. Up to 9 (KM0932), or 5 (KM0532), independent KVM consoles are able to access and control all of the servers on the installation. This configuration allows you to add servers and KVM switches a step at a time to match your company's growth. Daisy chaining KM0032 Matrix Expansion KVM switches offers a further cost-saving benefit, since the use of dedicated chain ports allow all of the switch's KVM ports to be utilized for server connections – none of them need to be used for cascading. For even greater expansion, the Matrix KVM Solution supports Cascading and Daisy Chaining in tandem. You can cascade compatible KVM switches from the KVM ports of a parent Matrix KVM Switch at the same time as you daisy chain the KM0032 Matrix Expansion switches – allowing you to add as many consoles and servers as your needs require.



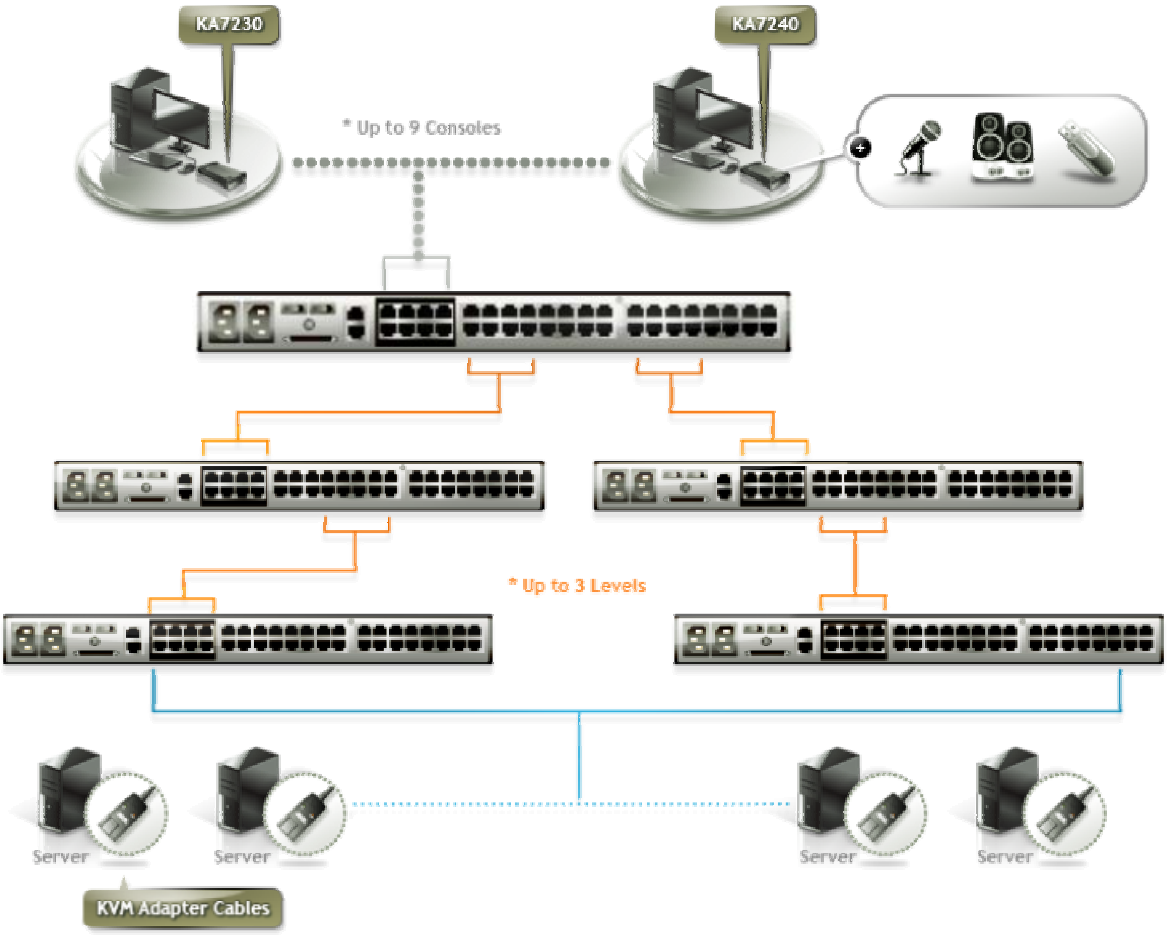
Application

Non-Blocked Access Configuration

>> Flexible Scalability, Full Access

The Matrix KVM Solution supports a 3 level cascade for KM0932/KM0532 switches. It also supports a single level cascade for other compatible KVM switches. All the GUI-compatible cascaded switches are integrated into the KM0932/KM0532's GUI, so that when the first level consoles bring up the UI, the port directory listing for all the connected servers is displayed in a composite tree view.

In a Non-Blocked Access configuration, utilizing 9 of the KVM ports of the first level KVM switch to connect to the console ports of a second level switch creates 9 bus connections between the first level parent switch and the second level child switch. This method can also be used when cascading to third level KVM switches. It allows all 9 consoles connected to a first level switch to have simultaneous access to any server on the same level, as well as having independent access to any server on any level of the installation.

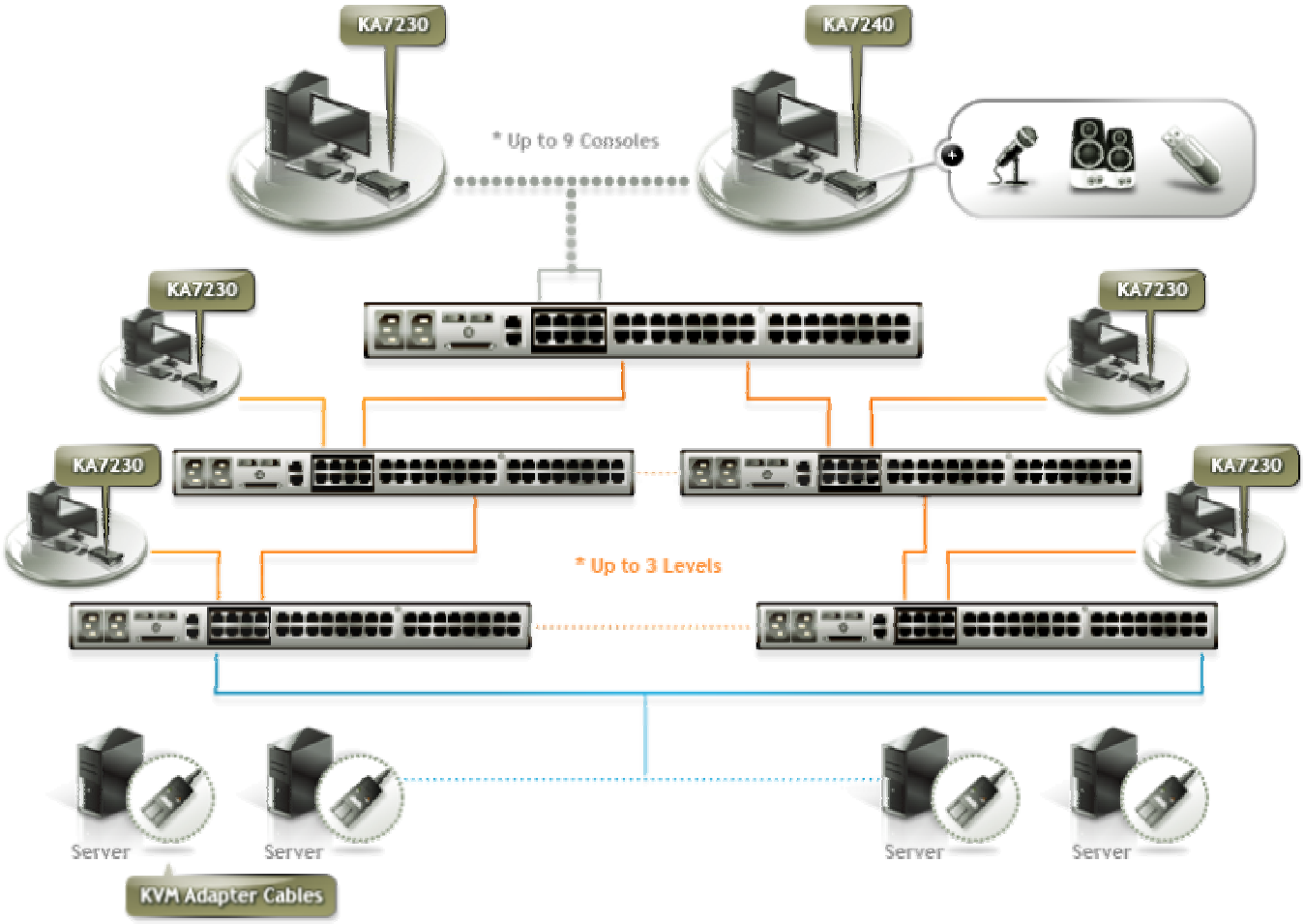


Application

Blocked Access Configuration

>> Flexible Scalability, Diverse Control

The number of bus connections between a parent and child KVM switch determines the number of users that can simultaneously access the KVM ports of the child switch. You establish the bus connections by connecting a KVM port on the parent switch to a console port on the child switch. In a Blocked Access configuration, you connect a console module to any available console port on the child switch. In this configuration, the console modules connected to the console ports of the child switch can only access KVM ports on their own level and on any switches cascaded below them. They cannot access the KVM ports of the parent switch that they are cascaded from. This is an important security feature, since it prevents operators at second or third level consoles from being able to access the servers connected to switches above their level.

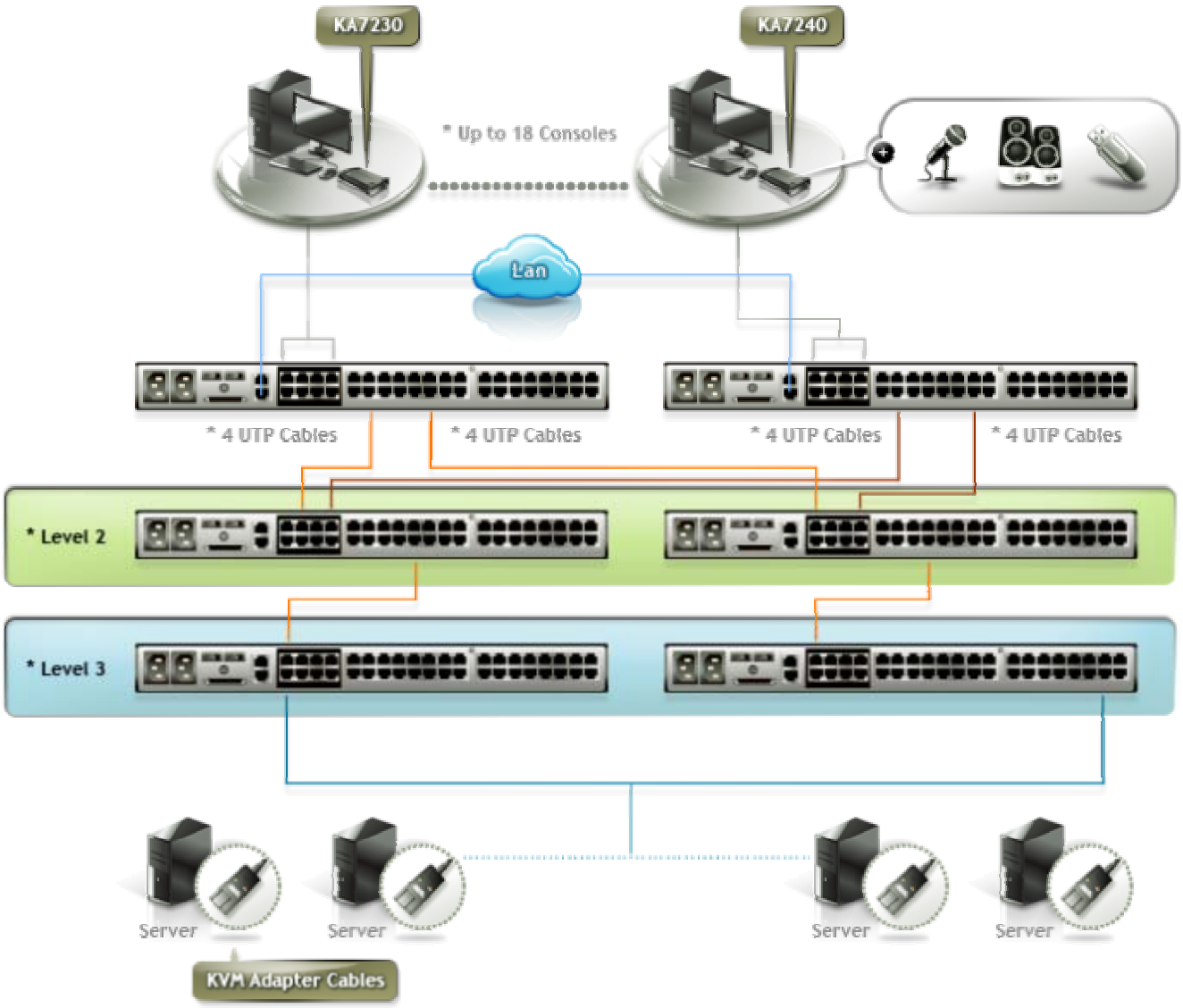


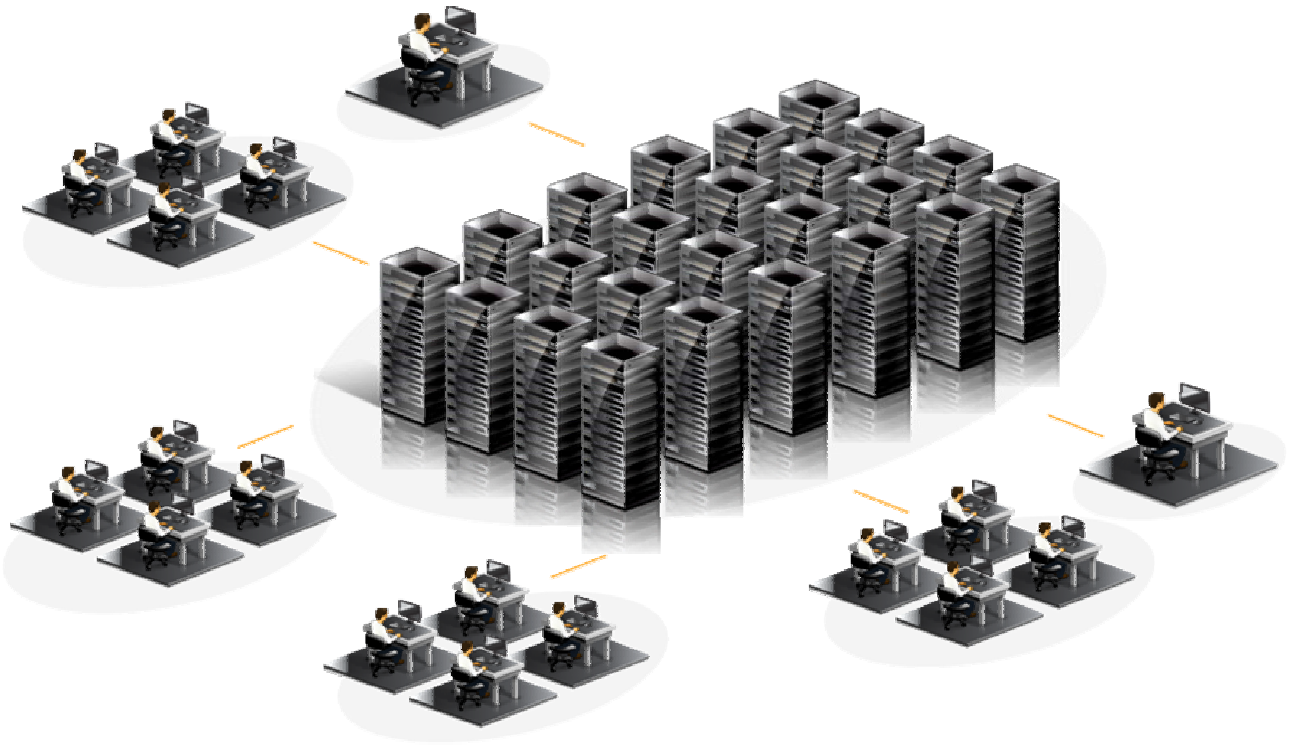
Application

Dual Root Configuration

>> Flexible Scalability, Console Expansion

The Matrix KVM Switch's Dual Root function allows you to achieve an 18-console configuration by linking two KM0932 KVM switches together. You can connect them to the same LAN segment and then designate one as the master and the other as the slave. In this configuration, up to 18 KVM consoles have the rights to access any servers on the installation.





Benefits

Cost Effective

Matrix KVM Switches allow 5 or 9 consoles to manage up to 32 target devices while only taking up 1U of rack space. They also simplify cabling requirements and reduce your total Installation cost by using Cat 5e/6 cable to connect console modules and KVM Adapter Cables.

Secure Access

The use of Cat 5e/6 cabling not only permits extending the distance between console and servers up to 300 meters, but also offers a network-independent configuration for secure access. The Matrix KVM Switch can be operated completely independently from the network. Its out-of-band operation – which provides access independent of the data center LAN or WAN – protects your data center from problems that may arise on the network infrastructure.

Flexible Scalability

Matrix KVM Switches can be installed in several configuration schemes, including daisy chained, non-blocked cascaded, blocked cascaded, or daisy chained and cascaded in tandem. Flexible expansion configurations allow up to 9 consoles to control thousands of servers. Adding consoles and servers a step at a time to match your data center's growth provides exactly the right level of hardware deployment to match your budget and expansion requirements.

Console Expansion

The Matrix KVM Switch's Dual Root function offers the ability to expand your number of consoles by linking two KM0932 switches together – resulting in an 18-console 64-port configuration. In addition, a blocked access cascade configuration enables you to add console modules to cascaded KVM switches to control the KVM ports on their cascade level (and on cascaded child switches). These configuration alternatives offer you the flexibility to expand the number of consoles as your data center's needs expand.

Multiplatform Support

The Matrix KVM Switch's modular design – using console modules to link the console devices (keyboards, monitors, and mice) to the switch, and KVM Adapter Cables to link the switch to the servers – allows for a high degree of platform and interface integration. You can have PS/2 and USB interfaces; PC, Mac, Sun, and Serial platforms; all working together smoothly on the same installation.

Superior Video Quality

Matrix KVM Switches provide high video quality – up to 1280x1024@60Hz. The video signals are transmitted via Cat 5e/6 cable to permit real-time throughput and true video quality. Auto Signal Compensation (ASC), assures optimum video resolution over extended distances, while an automatic skew compensation function corrects color phase and timing errors that occur over long distance transmissions, as well. The Matrix KVM Solution delivers real-time, high quality, video sessions for data center operators who spend long hours working on the servers while performing their critical operations.

Graphical User Interface

The Matrix KVM Switch offers an intuitive, user friendly graphical user interface (GUI) for both Console and Browser-based sessions. The composite integrated tree view of all connected devices offers convenient navigation, access, and control of all the equipment deployed on the installation.

Versatile Port Operation Modes

The Matrix KVM Solution offers versatile port operation modes for flexible server management. In Exclusive Mode, a user can gain exclusive viewing and control rights over a device for as long as he accesses it. Occupy Mode allows the first user to access a port to control that port while others can only view it. Share Mode enables multiple users to access and control a port at the same time on a cooperative basis – allowing users to collaborate with each other on any server. With Port Operation Mode support, the Matrix KVM Solution improves the data center's management efficiency.

Dual Power Supply

Dual Power supply operation provides backup redundancy and reliability – ensuring that down-time is kept at a minimum. Should one of the power supplies become unavailable, the other takes over in order to keep the system functioning normally. The Matrix KVM Solution has built -in 24/7 reliability to ensure the highest rate of availability for your data center services.

Power Association

Used in conjunction with ALTUSEN's PN0108 Power Over the NET™ power management device, a Matrix KVM Switch port can be associated with a power outlet – allowing power operation management of the server attached to the port from the switch's interface. This feature also supports associating a second outlet port (provided the server has a dual power supply), and lets you synchronize the operation for both power supplies. Power Association allows operators to manage a server's power operation with a single interface from inside the control room to reduce maintenance time and to increases management efficiency.

Virtual Media

Virtual Media support lets you map DVD/CD-ROMs and other storage media to servers that are connected to the switch with virtual media-capable KVM adapter cables. Virtual Media allows operators to simultaneously conduct file transfers, install applications and OS patches, and perform diagnostics on multiple selected servers from a single console in the control room as easily as if they were directly in front of the servers - reducing data center down-time and saving maintenance costs.

RS-232 Port Access Control

Each of the Console Modules has a built-in RS-232 port. Administrators can establish a serial terminal login to the Console Module in order to monitor the usage of all the consoles and all the ports. This function is ideal for projecting all of the console displays onto a wall in the control room for convenient monitoring of all operations, with the entire installation capable of being viewed on a port-by-port basis.

Audio enabled

The Matrix KVM Switch supports audio functions for multimedia-capable devices connected with audio-capable KVM Adapter cables. Sound output and beeps from the servers can be heard on the console speakers – allowing an administrator working in the control room to identify and troubleshoot system problems at an early stage, minimizing repair costs.

Adapter ID

The Adapter ID function stores port information such as the Adapter ID, OS, keyboard language, adapter name, operation modes, etc., on the KVM Adapter Cable. It enables you to relocate servers (together with their adapters) to different ports without having to reconfigure the adapters or change the user authorization settings of the KVM switch.

www.aten.com

Simply Better Connections™

Corporate Headquarters

ATEN International Co., Ltd.
3F, No.125, Sec. 2, Datung Rd. Sijhih City, Taipei 221, Taiwan
Phone: +886-2-8692-6789 Fax: +886-2-8692-6767
www.aten.com E-mail: online@aten.com.tw

U.S.A. Subsidiaries:
ATEN Technology Inc.
19641 DaVinci, Foothill Ranch, CA 92610, U.S.A
Phone: +1-949-428-1111 Fax: +1-949-428-1100
www.aten-usa.com E-mail: sales@www.aten-usa.com

ATEN New Jersey Inc.
155 Pierce Street, Somerset, NJ 08873, U.S.A
Phone: +1-732-356-1703 Fax: +1-732-356-1639
www.aten-usa.com E-mail: sales@aten.com

Belgium Subsidiary :
ATEN Infotech N.V.
Mijnwerkerslaan 34, 3550 Heusden-Zolder, Belgium
Phone: +32-11-531543 Fax: +32-11-531544
www.aten.be E-mail: sales@aten.be

U.K. Subsidiary :
ATEN U.K. Limited
229 Berwick Avenue, Slough, SL1 4QT, U.K.
Phone: +44-1753-539-121 Fax: +44-1753-215-253
www.aten.co.uk E-mail: sales@aten.co.uk

Japan Subsidiary :
ATEN Japan Co., Ltd.
8F Tatsumi Bldg. 16-6, Nishi-shinjuku 6-chome, Shinjuku-ku,
Tokyo 160-0023 Japan
Phone: +81-3-5323-7170 Fax: +81-3-5323-2181
www.atenjapan.jp E-mail: info@atenjapan.jp

Korea Subsidiary :
ATEN Advance Co., Ltd.
Eagle Town 3F #303, 278-20, Seongsu-dong 2-ga 3-Dong
Seongdong-gu, Seoul, Korea, 133-120
Phone: +82-2-467-6789 Fax: +82-2-467-9876
www.aten.co.kr E-mail: sales@aten.co.kr

China Subsidiary :
ATEN China CO.,LTD
18/F, Tower A,Horizon International Tower, No.6,Zhichun Road,
Haidian District, Beijing, China 100088
Phone: +86-10-5255-0110 Fax: +86-10-8296-1318
www.aten.com.cn E-mail: sales@aten.com.cn