IP-based KVM Link Extender for remote server management
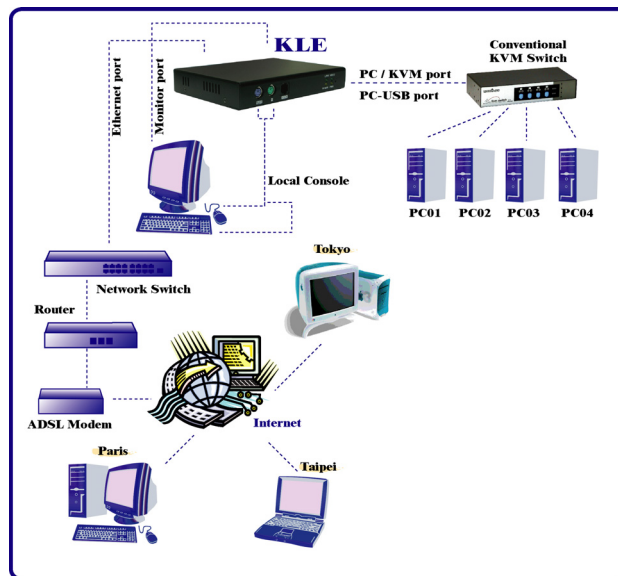
KLE for Kvm Link Extender

The name of **KLE** is derived from an acronymic combination from it full name, **KVM Link Extender**, which well explains the functionality of this powerful machine in itself. Though lightweight in size and compact in form factor, **KLE** is nevertheless a heavy-weight in its functional versatility, rock-solid robustness and formidable security. It supports full 1024-bit PKI authentication, 256-bit SSL data encryption [*], LDAP, RADIUS as well Active Directory authentication and RADIUS accounting.

KLE – the KVM Link Extender

Dominant yet cost-effective solution for remote server management scenarios

With the ubiquity of the DSL/Cable technology and the bandwidth availability therewith, the IP-based KVM technology has emerged as a dominant player in the new landscape of remote servers management. Today, the IP-based KVM Extender has been regarded as a better and more cost-effective solution to address the critical issue of remote servers management, which could only be partially tackled in the past by expensive yet redundant software solutions or Enterprise Management System. And **KLE** is a robust and versatile solution to address the needs of modern remote server management scenarios.
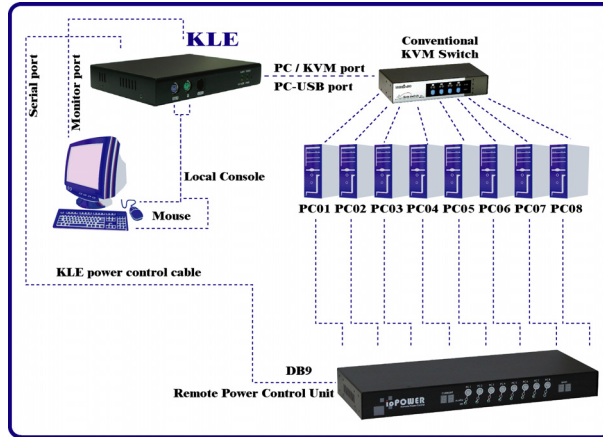

KLE connected to a conventional KVM Switch and multiple servers

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[*] The SSL connection over browser might be negotiated only with 128-bit strength, if your internet browser supports only 128-bit SSL encryption. Use a browser with 256-bit encryption strength will enable the browser connection to its full 256-bit strength.

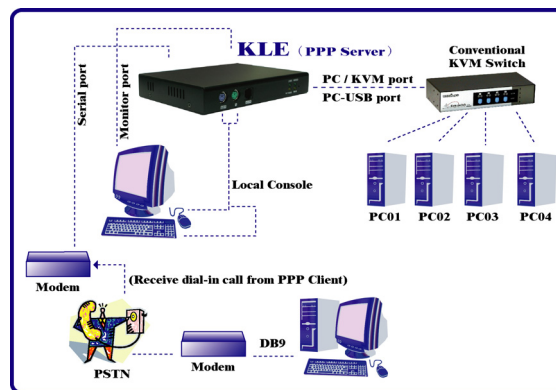### Total server control from BIOS level up anytime anywhere

KLE gives users total control from *preboot stage* such as the BIOS-level CMOS setting up to the *GUI applications* and *daily maintenance routines* such as power cycling (power control unit required). And all these could be nicely done on your admin desk using an ordinary web-browser management interface and a thin-client software viewer. All you need for accessing your computer is to login the **KLE** and download the viewer program and get yourself connected to a whole bunch of servers in seconds. A truly anytime anywhere access for the server administrator!

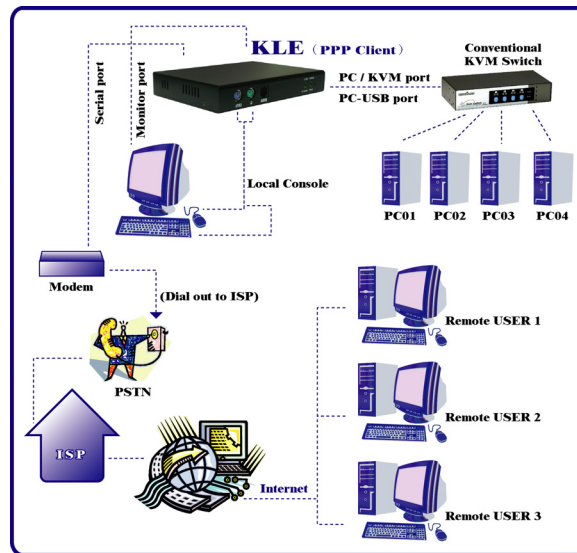KLE connected to a Remote Power Control Device

Versatile backup connection featuring a PPP Server or PPP Client

To provide the necessary redundancy of a second backup system while your network might no longer works in critical situation, **KLE** also allows an easy and convenient PPP connection over the dial-in modem phone line. It could serve as a PPP server to accept a peer computer to make PPP connection request over either a direct cable connection or a dial-in modem phone line. On the other hand, **KLE** could also serve as a PPP client to dial-in to your ISP or enterprise PPP server to connect to internetwork, making a truly anytime access for remote client anywhere on the Internet. Thus, the PPP server/client features in **KLE** allow users a second backup system, which offers a direct cable/modem dial-in access to your connected servers via PSTN while your network is down.

KLE as PPP server to accept dial-in request from a remote PPP client via modem line

The advantages of using **KLE,** as compared to the conventional software remote control solution is that: The hardware-based remote control solution such as **KLE** is able to access the server regardless of the server states while software remote control solution is non-functional while the server is still in the POST or preboot stage or in a "blue screen of death". **KLE** also offers power on/off alternatives if used with a remote power control unit.

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KLE as PPP client to dial-out to ISP for remote clients to access via internet

Rock-solid stability and ultra-security yet with flexibility and convenience to use

The **KLE** distinguishes itself among its peer products not only in its rock-solid stability in durable performance, but also in its industry-standard security features such as full 1024-bit PKI Authentication and 256-bit SSL data encryption. Together with 3 levels of viewer connection security levels in combination with 3 types of password policies and three categories of user privileges, all these make **KLE** a ultra-powerful IP Extender machine with ultra-flexibility for a customized balance between data safety and user convenience. On the other hand, the robustness and the ease of maintenance of the embedded systems involve zero costs for the unit management and maintenance.

Global Time Zone and Time Servers Support

To make **KLE** really comfortable with all the global time zones it will be deployed in, it is vital to provide a convenient Global Time Zone support since it will give a correct time stamp to all logging events, alert e-mail notifications and won't leave server admins in troubles with calculating the time differences he will inevitably encounter with servers in different time zones. Additionally, **KLE** also supports NTP time servers and keep its time always sync with the timer servers you specify. The KLE is even sophisticated enough to take care of the daylight saving time in each and every Time Zone/Region, thus saving troubles for updating time frame with daylight saving specifics every six months.

Upgrade and Configuration Backup is just a breeze

KLE is fully Web-enabled to allow software upgrade and configuration upload/backup over the Web Management Interface. All you need to do is to upload the files to **KLE** over Web interface and voila it's freshly restarted and begins working with those latest update functionalities and features-all within minutes and can be performed across oceans-by a remote SUPERADMIN!

Advantages Galore

With **KLE**, the server administrator can access enterprise server room or data center on his own seat without toils and troubles of going anywhere from across the street to oversea. And organizations can enjoy a uniquely centralized and very cost-effective control over its dispersed servers in different branch offices, even around the world, thus saving money for outsourcing costs.

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Features

General features
- Full-featured IP-based Remote Control Solution for server management
- Provides remote control for several servers when connected to a conventional KVM Switch
- Simultaneous access from multiple users
- No user limitation
- Facilitate centralized control
- Total control over the remote server from BIOS level up to GUI applications
- Remote Power On/Off support
- Total transparency of control
- Ultra-security using full 1024-bit PKI Authentication / 256-bit SSL encryption
- Work with LDAP / RADIUS / Active Directory Servers
- Ethernet 10/100 and serial PPP connections
- Factory default restore button to restore the unit back to factory default

TCP/IP remote connection
- Web Management Interface for all settings and upgrade/backup features
- Support Telnet session and FTP service (disabled by default for more security)

Thin-client Viewer Program
- Win-32 viewer and Java viewer for cross-platform compatibility
- Connection options configurable for optimized performance
- *Shared, Non-Shared* and *View Only* sessions
- Easy download and installation
- Multiple viewer instances can be run on a same client computer
- Automatic video optimization

Hi-Speed PPP Connection
- PPP Connection support over serial RS-232 interface up to 1 Mbps
- PPP server enabling for PPP connection across a pair of modems for secure or backup direct access
- PPP client enabling for PPP connection to the internet with a modem

Video server
- Support up to 1600 x 1200 @ 60 Hz resolution
- 8/16-bit color
- 3 Video Quality settings
- 3 Video Compression schemes
- 8-bit color reduction
- JPEG Compression option for low bandwidth internet connections
- Configurable database to set up new or unknown VGA modes
- Virtually compatible to any KVM Switch through simple configuration

Power ON-OFF Control Support

- Remote power ON-OFF control over serial interface
- Serial commands configurable to fit all serial power control devices
- Power ON-OFF privilege only for the SUPERADMIN users

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Security
- 1024-bit Public key Authentication using certificates generated by an external CA
- 256-bit SSL Encryption for keyboard, mouse and video signal transmissions
- Remote authentication support for SSL-secured LDAP or RADIUS servers
- RADIUS accounting support
- 3 SSL security levels :
  - No authentication – No encryption
  - Server Authentication – SSL encryption
  - Server & Client authentication – SSL encryption
- 3 password policies :
  - No Password
  - One global password for all users
  - One different password for each user
- Linux operating system offers robust virus resistance

Alarms and Notifications
- Alert e-mail notification and SNMP trap messages for critical server events such as No Video, Blue Screen and NumLock Test Failure

User Management
- User login either by querying the local user database or by connection to remote LDAP or RADIUS server
- 3 user privileges :
  - SUPERADMIN – to access complete set of management features and user features, including Power ON-OFF remote servers
  - ADMIN – partial set of management and all user features
  - USER – only user features

Global Time Zone Support
- Time support for all continents and major cities
- Time synchronization by connection to any NTP time servers
- Automatic Daylight Saving management

IP-based KVM Switch vs. Software Remote Management Solution

The difference between the IP-based KVM Switch hardware solution and the software solution is summarized in the following table:

IP KVM Switch vs.	Software Remote Management Solution
BIOS level setting	No BIOS Level Setting
Preboot stage intervention	No preboot stage intervention
Forced remote Power ON/OFF*	Only Ctrl-Alt-Del (soft reset)
NO extra software or hardware needed	Need to install software on every machine
Zero interference to sever operation	Software will interfere with server operation
Zero consumption of CPU power and Memory	Heavy consumption of CPU power and memory
Able to monitor the sever status at all time	Monitor only when the software is running
Cost-effective for sever farm management	Expensive license fee for managing bunch of servers
Effective to troubleshoot in all server states	Effective only when server is responsive
Centralized Control over global severs	Peer-to-peer control only
Easy usage with total transparency	Limited transparency of operation
Compatible with all conventional KVM Switch	Not compatible to work with conventional KVM
Leverage all functions of KVM Switch hotkeys	Not compatible to work with conventional KVM
Thin-client viewer for remote access	Extremely "Fat-client" for remote access
Viewer easily downloadable from internal website	Install your "fat" software on the remote machine
Convenience to set up a client environment	Takes a lot troubles to build up client environment

A Power Control Module is needed for forced remote Power ON/OFF while server not responding to any input device.

Specifications

Model Name	KLE
Number of Server ports	1 x
Server or KVM port connectors	**1x HDB 15-pin Male** + special cable assembly providing VGA, PS/2 mouse and PS2 keyboard connectors. **1 x USB type B**
Remote connections	Multiple connections [Shared/Private/View Only session]
Viewer Session	Shared/View Only – multiple users / Private – 1 User
Local Console Connectors	1 × PS/2 Keyboard 6-pin Mini Din female 1 × PS/2 Mouse 6 pin Mini Din female 1 × VGA HDB 15-pin Female
PC port connectors	1 x HDB15 (integrated with PS/2 KB and PS/2 mouse) 1 x USB Type B (for USB KB and USB mouse)
Digital Connector	RJ-45
Ethernet Interface	10/100 BASE-T connection with auto-sensing
Serial Console Port (front)	RJ-12 connector / 115200 bps max - Used only for console management
Serial Control Port (back)	RJ-12 / 1Mpbs high-speed serial for connect to external modem/ power control device
Server control remote interface	Win32 viewer / JAVA viewer
Management	With any browser connected to the embedded web server via HTTPS secure connection
Security	SSL, Encryption with 256-bit ephemeral keys User authentication based on password and PKI certificates
Video Resolution	1600 × 1200 max.
Keyboard emulation	PS/2 and USB
Mouse emulation	PS/2 and USB
Remote Power ON/OFF	Yes*
Power Input	DC 12V 2A
Operation Temperature	0 ~ 50°C
Storage Temperature	- 20 ~ 60°C
Humidity	0~90% RH, non-condensing
Size	0U
Housing	Metal / 0U
Dimension (L x W x H)	16 x 11.5 x 2.5 cm
Safety / EMI Certification	FCC, CE

* **ioPower** is a **KLE** accessory to provide remote power control capability to **KLE**