SecureLinx SLK Remote KVM User Guide

- SecureLinx SLK1
- SecureLinx SLK8
- SecureLinx SLK16

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Disclaimer

Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Note: *This equipment has been tested and found to comply with the limits for 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 this User Guide, may cause interference to radio communications.*

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

Revisions

Rev.	Date	Comments
A	2/04	
B	3/05	Updated firmware; added new Java viewer applet; added secondary administrator account, integrated remote power control support of SLP series.

Contents

5: Using the OSD Interface to Configure the SLK

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List of Tables

1: Quick Start

This Quick Start chapter describes how to get your SecureLinx™ SLK Remote KVM™ up and running in the shortest possible time. For detailed installation instructions, see Chapter 5, Installing the SLK. Topics in this chapter include:

Getting Started

1 Verify and inspect the contents of the SLK package using the enclosed packing slip or Table 3-1 on page 3-2. If any item is missing or damaged, contact your place of purchase immediately.

2 Rack-mount the SLK, if desired. For more information, see “Rack-Mounting the SLK” on page 3-10.

3 For optimum operation during remote sessions, prepare the target servers as described under “Preparing the Target Servers” on page 3-10.

4 To use your SLK with other KVM switches, see “Connecting KVM Switches” on page 3-16.

Making the Physical Connections

The following procedure describes how to perform SLK connections. Refer to Figure 1-1 on page 1-3, Figure 1-2 on page 1-3, and Figure 1-3 on page 1-4 for visual reference.

1 Disconnect the monitor, keyboard and mouse from the servers or KVM-switch that your SLK is to control.

2 Connect the local video, keyboard, and mouse to allow local console access to the SLK and the servers or KVM-switch attached to it:

- Connect the monitor plug to the blue 15-pin HDDB15 female port labeled **Monitor**.
- Connect the keyboard plug to the round PS/2 mini-DIN female port labeled **K**.
- Connect the mouse plug to the round PS/2 mini-DIN female port labeled **M**.

3 Connect the server monitor, keyboard, and mouse cables (removed in step 1) from the appropriate ports on the server to the appropriate channel ports on the SLK back panel:

- Connect the monitor plug to the black 15-pin HDDB15 male port labeled **Video**.
- Connect the keyboard plug to the round PS/2 mini-DIN female port labeled **K**.
- Connect the mouse plug to the round PS/2 mini-DIN female port labeled **M**.

The SLK1 has one channel providing individual ports for a monitor, keyboard, and mouse. The SLK8 and SLK16 have 8 and 16 channels, respectively, with monitor, keyboard, and mouse ports for each channel. For these models, start your connections at CH-1, then CH-2, and so on.

Note: *SLK1 and SLK8 only support 2-button mice. The SLK16 is compatible with 2-button wheel mice.*

4 Connect the SLK KVM to the network using the 10/100Base-T Ethernet port (RJ45) labeled **Network**.

5 To remotely control serial devices, configure the serial port(s) to suit your needs. All SLK models provide two serial ports for power control, Telnet, and logging functions. The SLK16 has a third serial port that can connect to an external modem for out-of-band access.

Note: *The second serial port on the SLK1 and SLK8 is an 8-pin mini-DIN connector that requires the supplied 8-pin–to–DB9 adapter.*

6 Connect the supplied power cord to the SLK's AC receptacle and to a power source.

Figure 1-1. SLK1 Back Panel

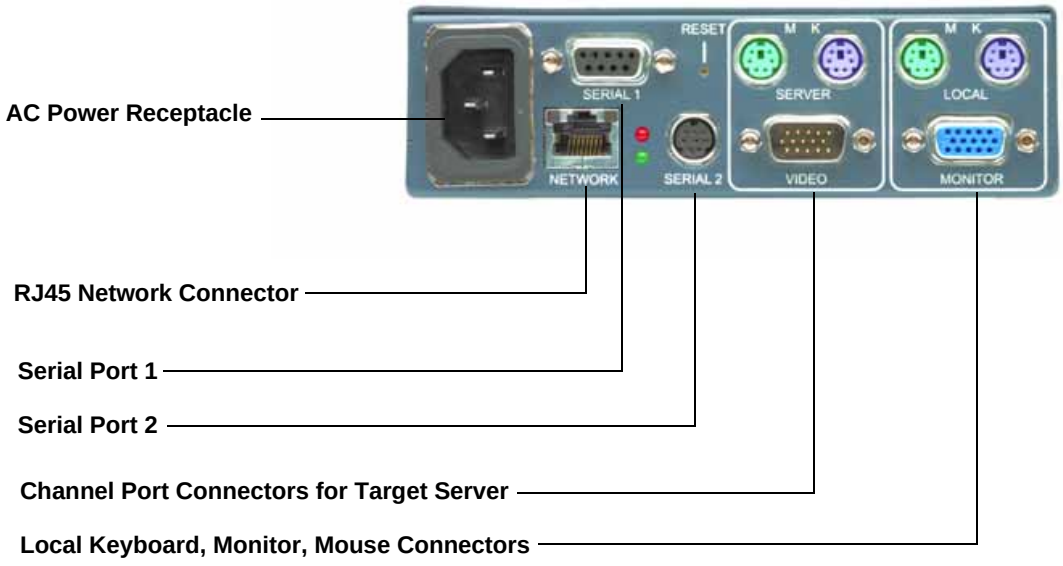


Figure 1-2. SLK8 Back Panel

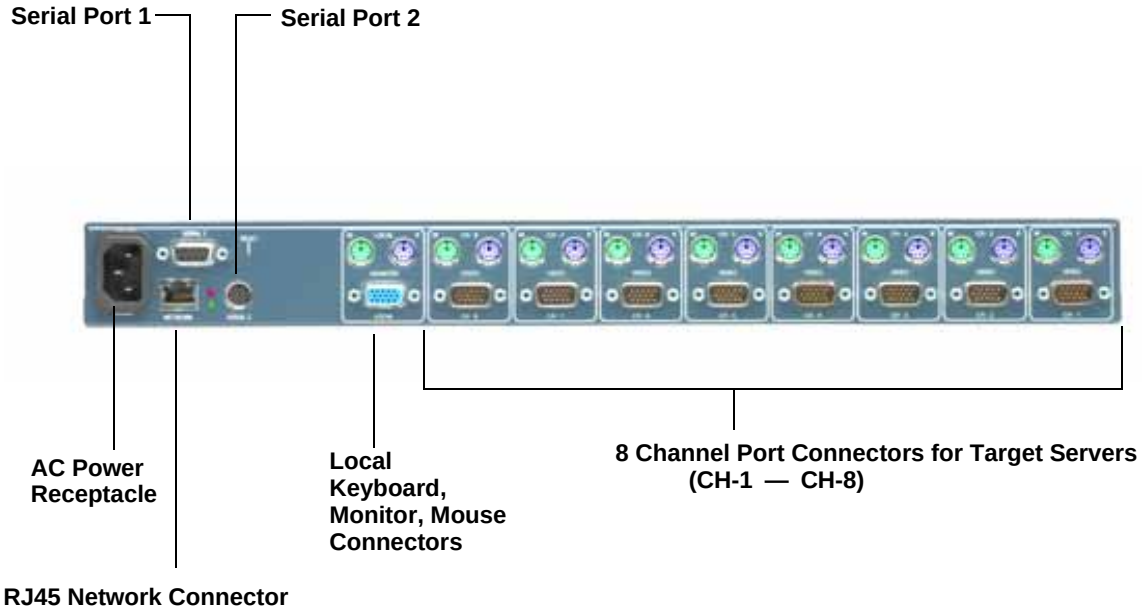
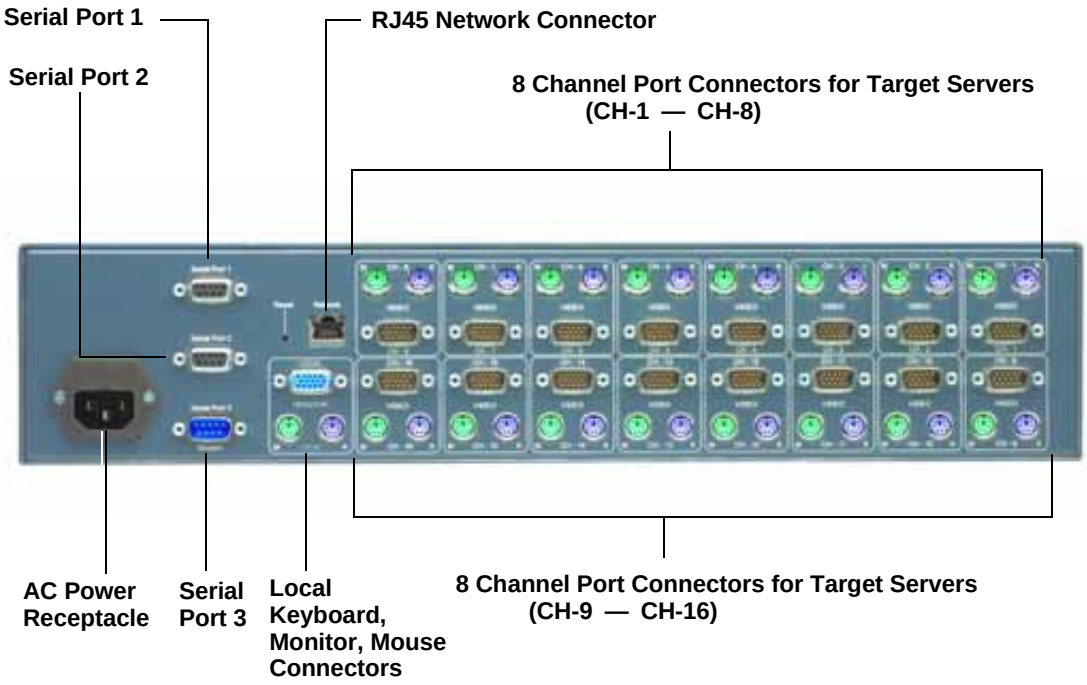


Figure 1-3. SLK16 Back Panel



Powering On and Initial Configuration

1 Power on the equipment in the following sequence: start with any KVM switches cascaded in front of your SLK, followed by your SLK, and then by attached servers and any converters or extenders.

2 At the local keyboard, press the 

key twice.

3 When the On Screen Display opens, scroll down to **Setup Menus** and press **Enter**.

4 Select **Network Configuration** and press **Enter**.

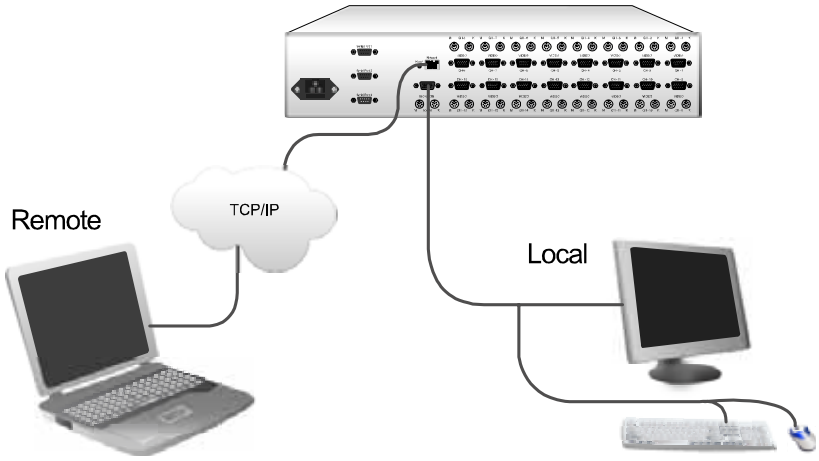
5 From the Network Configuration page, assign an IP address to your SLK. Write down this number, as you will need to use it in step 1 under “Validating Servers.”

6 If you want your SLK to communicate outside the Local Area Network (LAN), set the default gateway.

7 Select **Commit IP config changes** and press **Enter** to commit your changes.

Validating Servers

After you configure your SLK, connect a PC to it via a TCP/IP connection:



Verify each server's remote performance:

1 Start your web browser and enter the SLK's IP address in the address bar. User name and password prompts display.

2 Type the default user name **root** in lower-case characters and type the default password **PASS** in upper-case characters; then click **OK**. The SLK home page opens.

3 Under **Channel (click to view**), click the first channel (the channel in the top row).

4 Verify that you can view the video. If you see **NO INCOMING VIDEO**, see "Video Troubleshooting" on page 7-8.

5 Move the mouse and verify that the on-screen pointer moves as you move the mouse. If it does not, see "Mouse Troubleshooting" on page 7-5.

6 Click the **Back** button in your browser to return to the SLK home page.

7 Click the channel on the next row and repeat steps 4 through 6. Repeat this step for all the remaining channels that are being used.

Where to Go from Here

Following the initial configuration and verification, set up users and security parameters.

There are two ways to configure your SLK:

- Using its embedded web control interface
- Using the local console's On Screen Display (OSD) interface

The web control interface provides a graphical interface that lets you configure your SLK and control the target servers and other connected devices using a standard web browser. For more information, see Chapter 4, "Using the Web Control Interface to Configure the SLK."

The OSD configuration method provides a text-based interface with minimal prompting and guidance. For more information, see "Using the OSD Interface to Configure the SLK."

After you configure your SLK, you can:

- Change the master account password. See "Changing the Master Account Password" on page 4-23.
- Check for updated firmware. See "Uploading Firmware" on page 8-1.
- Upload the proper encryption certificate and key into the SLK Flash File if you want to use encryption. See "Using Security and Encryption" on page 8-3.

Note: *For answers to frequently asked questions about the SecureLinx SLK Remote KVMs, please visit* www.lantronix.com/support.

2: Introduction

This chapter provides introductory information about your SecureLinx SLK Remote KVM. Topics in this chapter include:

Overview

SecureLinx is a family of remote server-management solutions that enable remote clients to efficiently control their target servers and serial devices over a Local Area Network (LAN) or the Internet using the standard Transmission Control Protocol/Internet Protocol (TCP/IP). Secure remote access is provided through any web browser by entering the SLK’s IP address. Once access is granted, remote clients can perform activities such as resetting the target hardware, accessing the Basic Input Output System (BIOS), gaining keyboard and mouse control, and cycling power — as if they were accessing the server locally.

Note: *VNC can also be used for remote access. However, because VNC does not support encryption, it does not provide a secure connection unless used with a Virtual Private Network (VPN) or Secure Shell (SSH).*

SecureLinx SLK Remote KVMs also provide automatic monitoring and notification capabilities that notify you of problematic symptoms in your network environment before they become critical. This break-through technology makes the SLK an essential component of your server crisis-management infrastructure by giving you the power to quickly recover from mission-critical server failures anywhere in the world.

SecureLinx SLK Remote KVMs also save you money by eliminating redundant peripherals (such as keyboards, monitors, and mice) and providing centralized control of multiple servers. Best of all, SecureLinx SLK Remote KVMs are plug-and-play solutions that require no additional hardware or software, making initial setup quick and simple. This non-intrusive approach means the SLK does not consume valuable server resources while, at the same time, minimizes potential points of failure.

With a small investment, SecureLinx SLK Remote KVMs can preserve precious office space, centralize the management of your servers and serial devices, slash redundant peripheral costs, and increase uptime and productivity.

SecureLinx SLK Models

SecureLinx SLK Remote KVMs come in three models:

- SLK1 lets local and remote users control 1 server.
- SLK8 lets local and remote users control up to 8 servers.
- SLK16 lets local and remote users control up to 16 servers.

SLK1

The SLK1 provides one local user and multiple remote users with “shared” access to one server. All users have simultaneous access to the single server. Because this access is shared, only one user should control the server at a time. The SLK1 has two serial ports.

SLK8

The SLK8 provides one local user and multiple remote users with access to up to eight servers. The SLK8 supports independent operation between the local user and remote users. This allows the local user to perform tasks independently of remote users. For example, the local user might access the server on channel 1, while remote users access the server on channel 2 at the same time.

By contrast, all remote users are dependent on each other. If a remote user changes the view from the server on channel 2 to the server on channel 3, for example, all other remote users view the channel 3 server.

The SLK8 has two serial ports.

SLK16

The SLK16 provides one local user and multiple remote users with access to up to 16 servers. The SLK16 supports up to 6 independent remote sessions. This allows the local user and up to six remote users to perform simultaneous tasks independently of each other. They can all access the same server or servers on different channels.

The SLK16 also allows a remote user to “lock down” his server channel for his use only. Locking down a channel privatizes the session, preventing the channel from being accessed by other users. When a channel is locked, only the user who locked it and the SLK administrator can unlock the channel.

The SLK16 has three serial ports.

Features and Benefits

Features at a Glance

Table 2-1 summarizes the features of the three SLK models.

Table 2-1. SLK Feature Comparison

Feature Description	SLK1	SLK8	SLK16
Number of server ports	1	8	16
Number of independent remote clients	1	1	6
Number of multipurpose serial ports	2	2	3
Number of user profiles	32	32	32
Monitors video output of all servers simultaneously	No	Yes	Yes
Ability to assign server access for each individual user	No	Yes	Yes
Dial-up access via third serial port	No	No	Yes
Rack size	1U	1U	2U

Feature Descriptions

Anytime, Anywhere Access

SecureLinx SLK Remote KVMs provide centralized control for managing multiple-server environments. Depending on the model, the SLKs can provide remote KVM access to 1, 8, or 16 servers via the Internet or Local Area Network. SLK units can also be daisy-chained with KVM switches to control more servers.

Access is provided through a standard web browser or free VNC software. The SLK16 also provides dial-up modem access.

Complete Control

SecureLinx SLK Remote KVMs provide simultaneous server access to a local user and multiple remote users. They deliver full BIOS-level control, with remote power cycling and power on/off. They also provide 2 or 3 programmable serial ports, depending on the model. For convenience, the SLKs support user-configurable hot-keys for providing instant access to the On Screen Display (OSD).

Advanced Security for Total Control Over System Access

SecureLinx SLK Remote KVMs offer a compete solution. They require no additional software or hardware, and are completely non-intrusive, with minimal impact on servers.

All keyboard and mouse data is fully encrypted with 128-bit Secure Sockets Layer (SSL) encryption. In addition, SecureLinx SLK Remote KVMs support multi-layer

users/passwords and upgradeable public-key certificates. VPN and SSH environments can be used to provide external encryption to support existing security policies. In addition, the SLK provides “Turtle Mode” and “Stealth Mode.” These automated security features serve to hide the SLK on a network and provide the ability to shut down the SLK if it is attacked by hackers.

Superior Performance

SecureLinx SLK Remote KVMs deliver unparalleled performance through state-of-the-art compression algorithms, low bandwidth consumption, and high-performance mouse tracking and synchronization. They also monitor servers and notify users if a connected server encounters problems.

Easy Setup

SecureLinx SLK Remote KVMs offer true plug-and-play simplicity. They are compatible with most KVM switches and operating systems.

Configuration is performed through an intuitive web interface, with point-and-click access to all servers through a web browser.

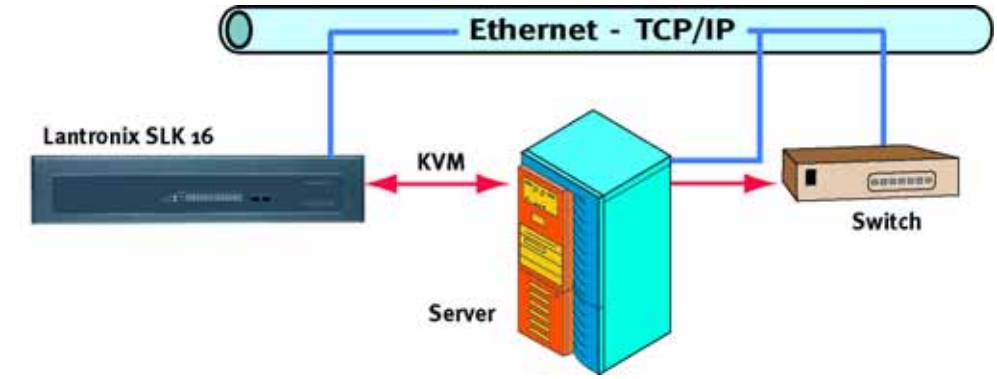
SLK Configurations

The following sections illustrate the various network configurations in which the SLKs can be used.

Connecting to the Same Network and Switch as the Server

Figure 2-1 shows an SLK connected to the same Ethernet and Switch as the server.

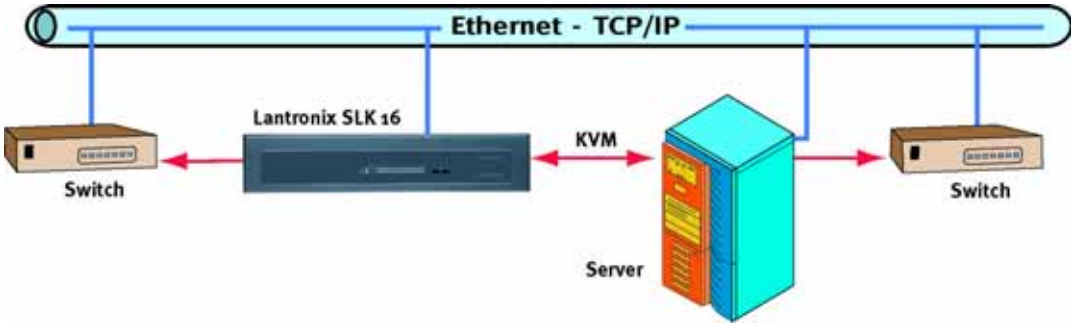
Figure 2-1. Connecting to the Same Network and Switch as the Server



Connecting to Different Switches

In Figure 2-2, the SLK and server are connected to different switches.

Figure 2-2. Connecting to Different Switches



Multiple Server Configurations

SecureLinx SLK Remote KVMs can connect to an existing KVM switch, as shown in Figure 2-3. During the initial setup, you connect a keyboard, monitor, and mouse to the SLK local port. After the initial setup is complete, you can leave the keyboard, monitor, and mouse connected to the local port for local monitoring.

Figure 2-3. Multiple Server Configuration without Firewall

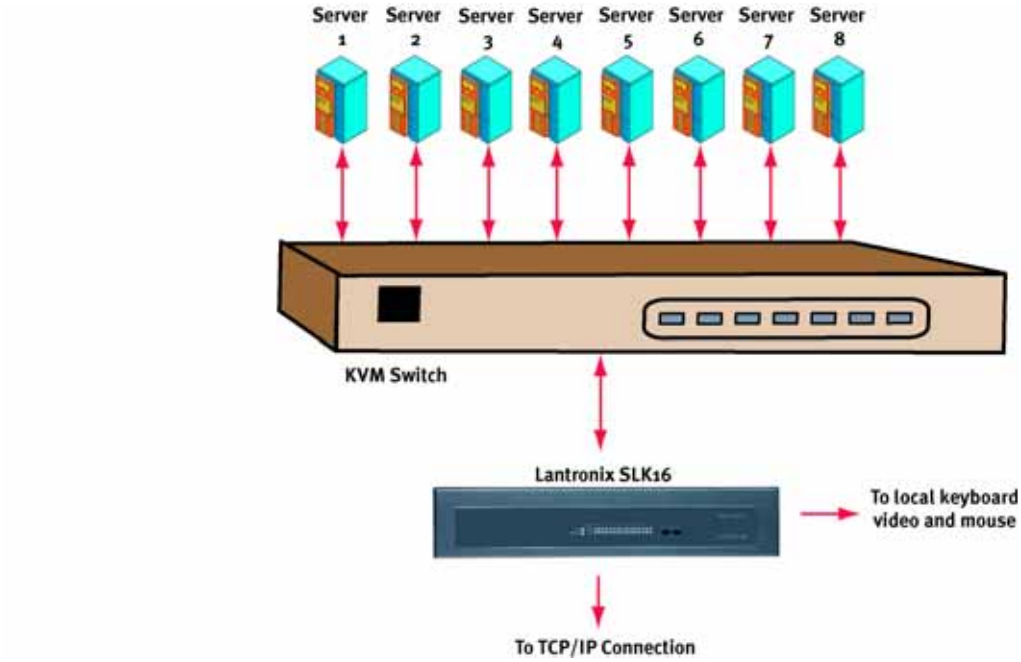
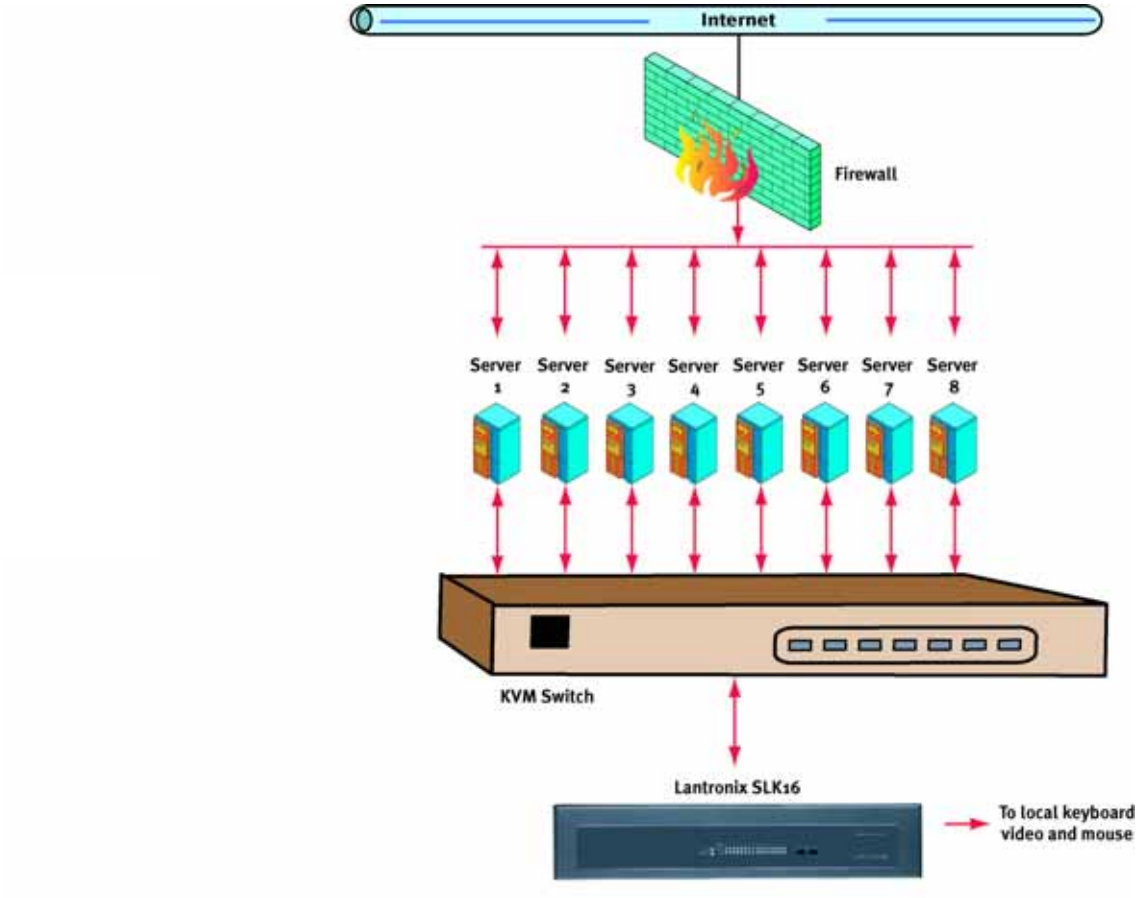


Figure 2-4 shows another multiple-server configuration. This example includes a firewall. In this example, the SLK continues to monitor the servers, even if the firewall fails or the connection to the firewall goes down.

Figure 2-4. Multiple Server Configuration with Firewall



Note: *If the KVM switch requires a USB connection to the SLK, you need an appropriate USB-to-PS/2 adapter.*

3: Installing the SLK

This chapter describes how to install SecureLinx SLK Remote KVMs. Topics in this chapter include:

Unpacking Your Components

Verify and inspect the contents of the SLK package using the enclosed packing slip or Table 3-1. If any item is missing or damaged, contact your place of purchase immediately.

Table 3-1. Components Shipped with the SecureLinx SLK Remote KVMs

SLK Model	Package Components
SLK1	❖ SecureLinx SLK1 1-port Remote KVM ❖ U.S. power cord (500-041) ❖ Serial “Y” mini-DIN8–to–RJ12/DB9F cable (SLKCHY001-01) ❖ Six-foot, 3-in-1 KVM, PS/2 cable (SLKCHS006-01) ❖ SecureLinx SLK Remote KVM User Guide
SLK8	❖ SecureLinx SLK8 8-port Remote KVM ❖ U.S. power cord (500-041) ❖ Rack-mount brackets (SLKB08000-01) ❖ Serial “Y” mini-DIN8–to–RJ12/DB9F cable (SLKCHY001-01) ❖ SecureLinx SLK Remote KVM User Guide
SLK16	❖ SecureLinx SLK16 16-port Remote KVM ❖ U.S. power cord (500-041) ❖ Rack-mount brackets (SLKB16000-01) ❖ SecureLinx SLK Remote KVM User Guide

Items Supplied by the User

In addition to the items in your package, you need the following items to install your SLK:

- A keyboard, monitor, and mouse for local console access:
  - The keyboard and mouse should have PS/2 cables or equivalent adapters.
  - The monitor should have a standard 15-pin VGA male-to-female cable.
- A standard Cat 5 network patch cable for connecting the SLK to your network.

Note: *The SLK8 and SLK16 models also require the user to provide the appropriate keyboard, mouse, and video cables (such as part number SLKCHS006-01) to attach the target servers.*

The following items are optional:

- Serial devices and cables, if you want to control serial devices with the SLK.
- A KVM switch.
- A 19-inch rack and mounting hardware, if you want to rack-mount the SLK. For more information, see “Rack-Mounting the SLK” on page 3-10.

Hardware Description

The following sections describe the front and back panels of the SLK1, SLK8, and SLK16.

SLK1 Front and Back Panels

Figure 3-1 shows the front panel of the SLK1, and Table 3-2 describes the front panel components.

Figure 3-1. SLK1 Front Panel

Table 3-2. SLK1 Front Panel Description

1	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection
2	Link/Activity LED: ON = good connection OFF = no connection Blinking = network activity

Figure 3-2 shows the back panel of the SLK1, and Table 3-2 describes the back panel components.

Figure 3-2. SLK1 Back Panel

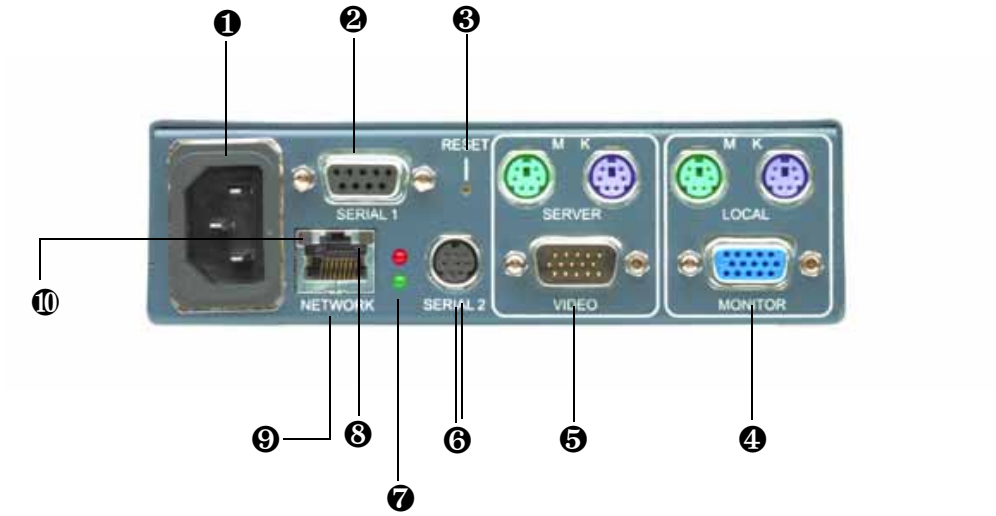


Table 3-3. SLK1 Back Panel Description

1	SLK power connector
2	Serial port 1 (DB9 female, DCE)
3	Recessed reset button. Use a paper clip (or equivalent) to reset the SLK. Does not affect attached server. This unit only controls one device.
4	One group of **Local** connectors for connecting a local console. Each connector is labeled and color coded. **M/green** PS/2 mouse connector (6-pin mini-DIN female) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Monitor/blue** VGA monitor connector (HDDB15 female)
5	One group of **Server** connectors for managing the target server or attached KLM. Each connector is labeled and color coded: **M/green** PS/2 mouse connector (6-pin mini-DIN female) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Video/black** VGA monitor connector (HDDB15 male)
6	Serial port 2 (8-pin mini-DIN, DCE)
7	Red and green indicator lights that alternate during normal operation
8	Link/Activity LED: ON = good link connection OFF = no link Blinking = network activity
9	RJ45 network connector.
10	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection

SLK8 Front and Back Panels

Figure 3-3 shows the front panel of the SLK8 and Table 3-4 describes the front panel components.

Figure 3-3. SLK8 Front Panel

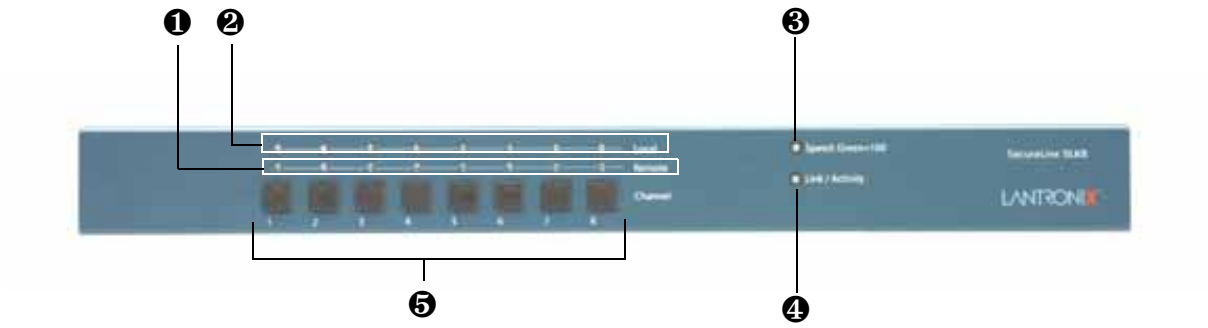


Table 3-4. SLK8 Front Panel Description

1	Eight remote channel LEDs show which remote channel is active.
2	Eight local LEDs show which local channel is selected for local monitoriing.
3	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection
4	Link/Activity LED: ON = good connection OFF = no connection Blinking = network activity
5	Eight push-buttons for selecting the local channel.To select a channel, a local user can use the On Screen Display (OSD) or press the front panel push-button under the desired channel.

Figure 3-4 shows the back panel of the SLK8, and Table 3-5 describes the back panel components.

Figure 3-4. SLK8 Back Panel

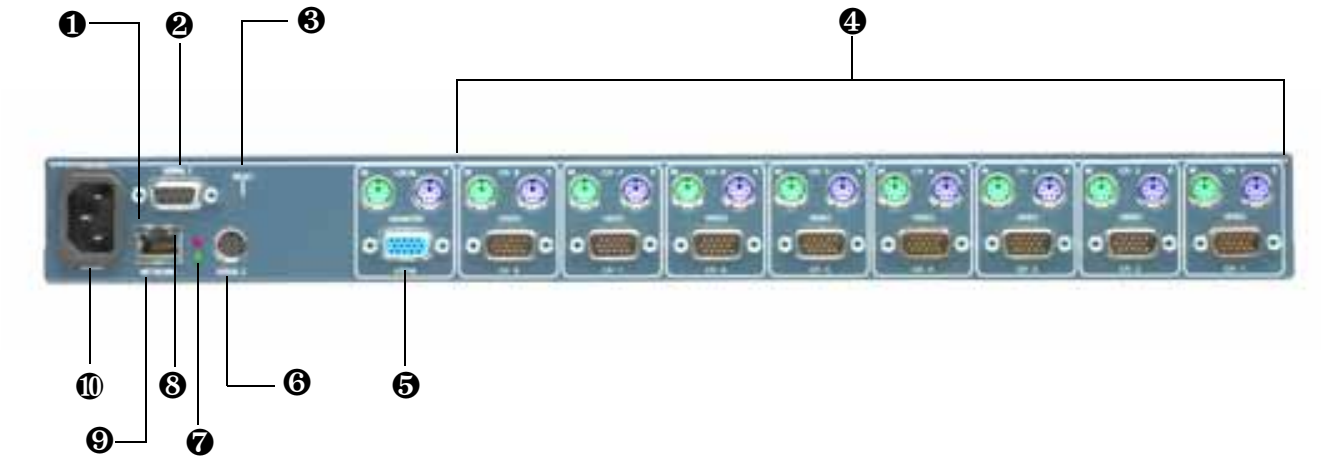


Table 3-5. SLK8 Back Panel Description

1	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection
2	Serial port 1 (DB9 female, DCE).
3	Recessed reset button. Use a paper clip (or equivalent) to reset the SLK. Does not affect attached server. This unit only controls one device.
4	Eight groups of **Server** connectors, labeled **CH-1** through **CH-8**, for managing up to eight target servers. Each connector is labeled and color coded: **M/green** PS/2 mouse connector (6-pin mini-DIN female) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Video/black** VGA monitor connector (HDDB15 male)
5	One group of **Local** connectors for connecting a local console. Each connector is labeled and color coded. **M/green** PS/2 mouse connector (6-pin mini-DIN female) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Monitor/blue** VGA monitor connector (HDDB15 female)
6	Serial port 2 (8-pin mini-DIN, DCE)
7	Red and green indicator lights that alternate during normal operation
8	Link/Activity LED: ON = good link connection OFF = no connection Blinking = network activity
9	RJ45 network connector
10	SLK power connector

SLK16 Front and Back Panels

Figure 3-5 shows the front panel of the SLK16, and Table 3-6 describes the front panel components.

Figure 3-5. SLK16 Front Panel

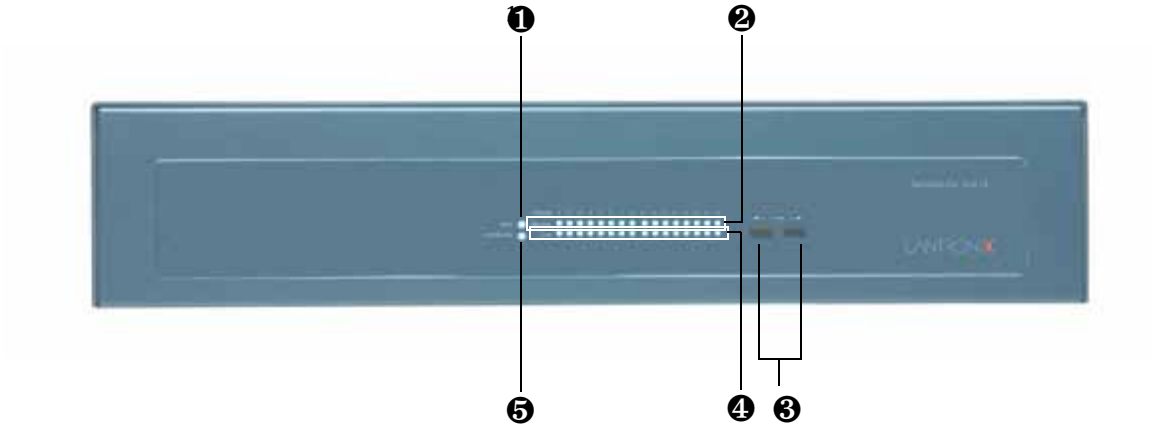


Table 3-6. SLK16 Front Panel Description

1	Link/Activity LED: ON = good connection OFF = no connection Blinking = network activity
2	Sixteen remote channel LEDs show which remote channels are active. Up to six LEDs (six users) can be active at one time.
3	Sixteen local LEDs show which local channel is selected for local monitoring. To select a channel, a local user can use the OSD or the press the front panel push-buttons.
4	Front panel push-buttons lets you connect to one of 16 local channels. Press the left button to move down and the right button to move up.
5	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection

Figure 3-6 shows the back panel of the SLK16 and Table 3-7 describes the back panel components.

Figure 3-6. SLK16 Back Panel

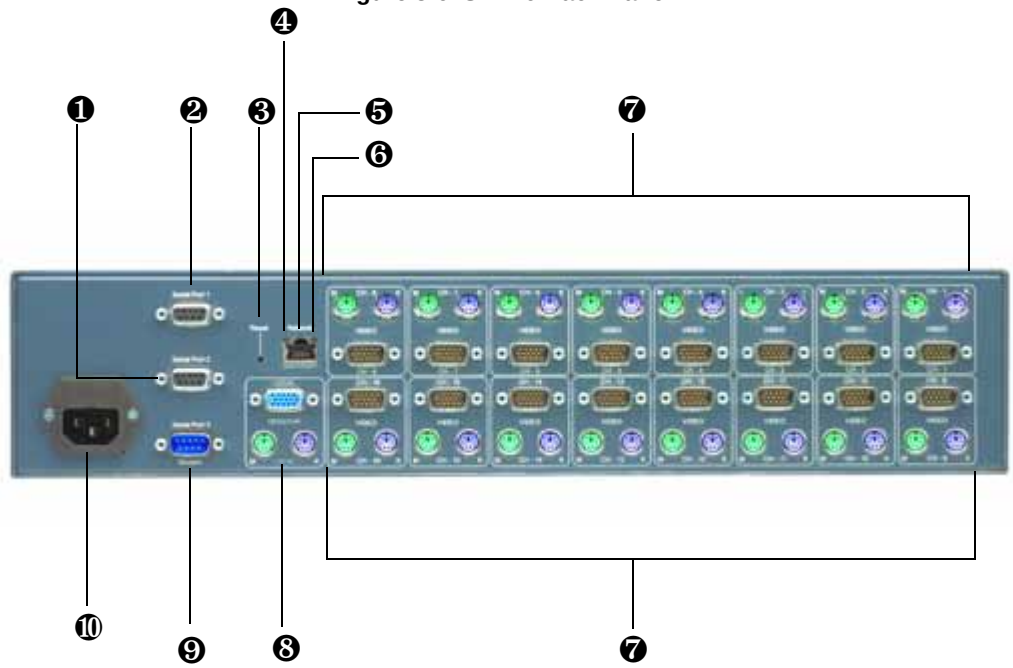


Table 3-7. SLK16 Back Panel Description

1	Serial port 2 (DB9 female, DCE)
2	Serial port 1 (DB9 female, DCE)
3	Recessed reset button. Use a paper clip (or equivalent) to reset the SLK. Does not affect attached servers
4	10/100 Speed LED: **Green** = 100 Base-T connection **Orange** = 10 Base-T connection
5	RJ45 network connector.
6	Link/Activity LED: ON = good link connection OFF = no link Blinking = network activity
7	Sixteen groups of **Server** connectors, labeled **CH-1** through **CH-16**, for managing up to 16 target servers. Each connector is labeled and color coded: **M/green** PS/2 mouse connector (6-pin mini-DIN) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Video/black** VGA monitor connector (HDDB15 male)

8	One group of **Local** connectors for connecting a local console. Each connector is labeled and color coded. **M/green** PS/2 mouse connector (6-pin mini-DIN female) **K/purple** PS/2 keyboard connector (6-pin mini-DIN female) **Monitor/blue** VGA monitor connector (HDDB15 female in blue)
9	Serial port 3 (DB9 male, DTE)
10	SLK power connector

Installing the SLK

Installing the SLK consists of the following steps:

1 Install the SLK in a rack to use it in a rack-mount configuration. See “Rack-Mounting the SLK” below.

2 Prepare the target servers. See “Preparing the Target Servers” below.

3 Connect the local keyboard, monitor, and mouse and cables for the target servers that are to be remotely controlled. See “Connecting Devices to the SLK” on page 3-13.

4 Connect the SLK to your network. See “Connecting to the Network” on page 3-16.

5 Optional: connect serial devices to the SLK. See “Connecting Serial Devices” on page 3-16.

6 Connect the SLK to a power source. See “Connecting to a Power Source” on page 3-17.

Rack-Mounting the SLK

To rack-mount the SLK, place it in a suitable 19-inch rack (the SLK1 and SLK8 are 1U in size, while the SLK16 is 2U). The SLK8 and SLK16 come with their own mounting hardware. Mounting hardware for the SLK1 can be ordered from Lantronix.

When rack-mounting the SLK units, place the rack in a dry, well-ventilated location, with a minimum of dust and vibration. Leave at least 1 inch of clearance on each side of the unit for air to circulate. (Units run hotter when in a rack than when operating as stand-alone devices.)

Preparing the Target Servers

For optimum operation and performance, use the following guidelines to configure the target servers as recommended in the following sections.

Optimizing the System

To optimize the attached servers, use the following guidelines:

- Remote access can introduce a measure of latency, and a user is likely to see a delayed response to mouse or keyboard input. Enabling features that slow the boot process (such as seek floppy, enhanced startup testing, and enhanced memory testing) increase the opportunity to send a keybound signal to enter the BIOS mode of an attached server.
- If you are using an optional third-party power control unit, access the system’s Basic Input/Output System (BIOS) and enable **Power on state upon power recovery**.

Optimizing Video

For optimum viewing during remote sessions, use the following guidelines to configure the video resolution settings on the servers that the SLK will control:

- Make sure all monitors and adapters are VESA-compliant.
- Select a video resolution of 1280 x 1024 or less.
- Select a refresh rate of 75 Hz or below.
- Install the latest video drivers from the original manufacturer.
- Disable energy savings, suspend, and hibernation modes.
- Turn off screen savers.
- Unclutter the desktop by choosing a solid-color background with minimal icons.
- Disable animations and video effects such as fade out and show content when dragging.

Adjusting Your Mouse

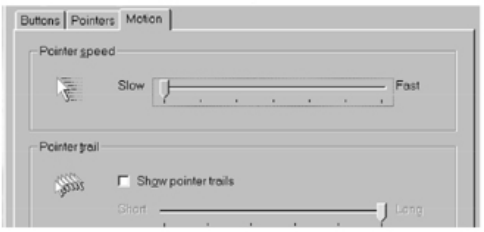
For optimum mouse control during remote sessions, use the following guidelines to configure the mouse settings on the servers that the SLK will control:

- Use generic mouse drivers only. Avoid elaborate “ergonomic” drivers.
- Recommended mouse pointer speed: depends on the server operating system (see Figure 3-7).

Figure 3-7. Recommended Mouse Settings for Target Servers

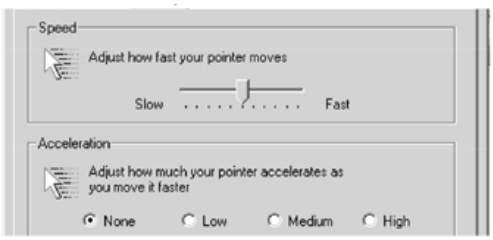
Windows 98

Set pointer speed to slowest, and leave trails off.



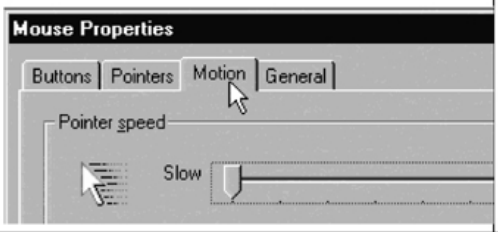
Windows 2000

Set motion to Slow, acceleration to none.



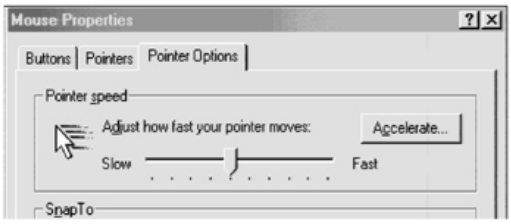
Windows NT

Set motion to Slow.



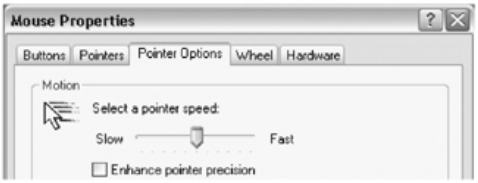
Windows ME

Adjust pointer to midrange speed. Turn off Accelerator



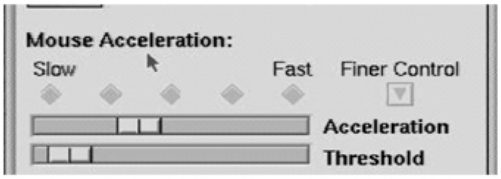
Windows XP

Set pointer speed to medium. Unlock Enhance.



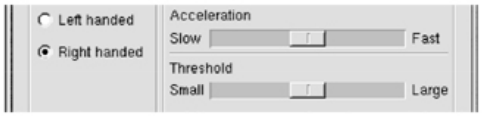
Silicon Graphics Inc IR IX

Adjust acceleration below midrange. Set threshold low.



Linux

Set acceleration to medium, set threshold to medium.



Or, on the command line, set acceleration and threshold by **xset mouse 11** .

Note: *SLK1 and SLK8 only support 2-button mice. The SLK16 is compatible with 2-button wheel mice.*

Connecting Devices to the SLK

The following sections describe how to connect devices to the SLK. Refer to Figure 3-8, Figure 3-9, and Figure 3-10 for visual reference.

Preparing the Servers

Use the following procedure to prepare the target servers that the SLK is to manage.

1 Optimize the servers according to the recommendations under “Preparing the Target Servers” on page 3-10.

2 Power-down all equipment that will be connected to the SLK.

3 Disconnect the monitors, keyboards, and mice from the servers that the SLK will manage.

Connecting a Local Keyboard, Video, and Mouse

Before you perform the target server connections, connect the video, keyboard, and mouse to the local ports on the SLK back panel. These connections let you perform administrative tasks. They also let you control the attached servers using a single monitor, keyboard, and mouse on the local console.

1 Connect the monitor plug to the blue HDDB15 female port labeled **Monitor**.

2 Connect the keyboard plug to the purple PS/2 port labeled **K**.

3 Connect the mouse plug to the green PS/2 port labeled **M**.

Connecting Target Servers to SLK

Use the following procedure to connect servers to the SLK back panel.

Note: *For low noise and reduced wiring clutter, use Lantronix-suggested KVM cables to connect target servers to the SLK.*

SLK1

1 Connect the mouse to the green PS/2 mini-DIN female connector labeled **M**.

2 Connect the keyboard to the purple PS/2 mini-DIN female connector labeled **K**.

3 Connect the monitor plug to the black HDDB15 male connector labeled **Video**.

The SLK1 manages one server. Server connections are made using the mouse, keyboard, and video connectors under **Server** (see Figure 3-7).

SLK8 and SLK16

The SLK8 and SLK16 use 8 and 16 channels to manage 8 and 16 servers, respectively. The channels are labeled **CH-1** through **CH-8** on the SLK8 (see Figure 3-10) and **CH-1** through **CH-16** on the SLK16 (see Figure 3-11). Each channel has a set of mouse, keyboard, and video connectors. When you connect target servers, start with **CH-1**, then **CH-2**, and so on.

Figure 3-8. SLK1 Connections

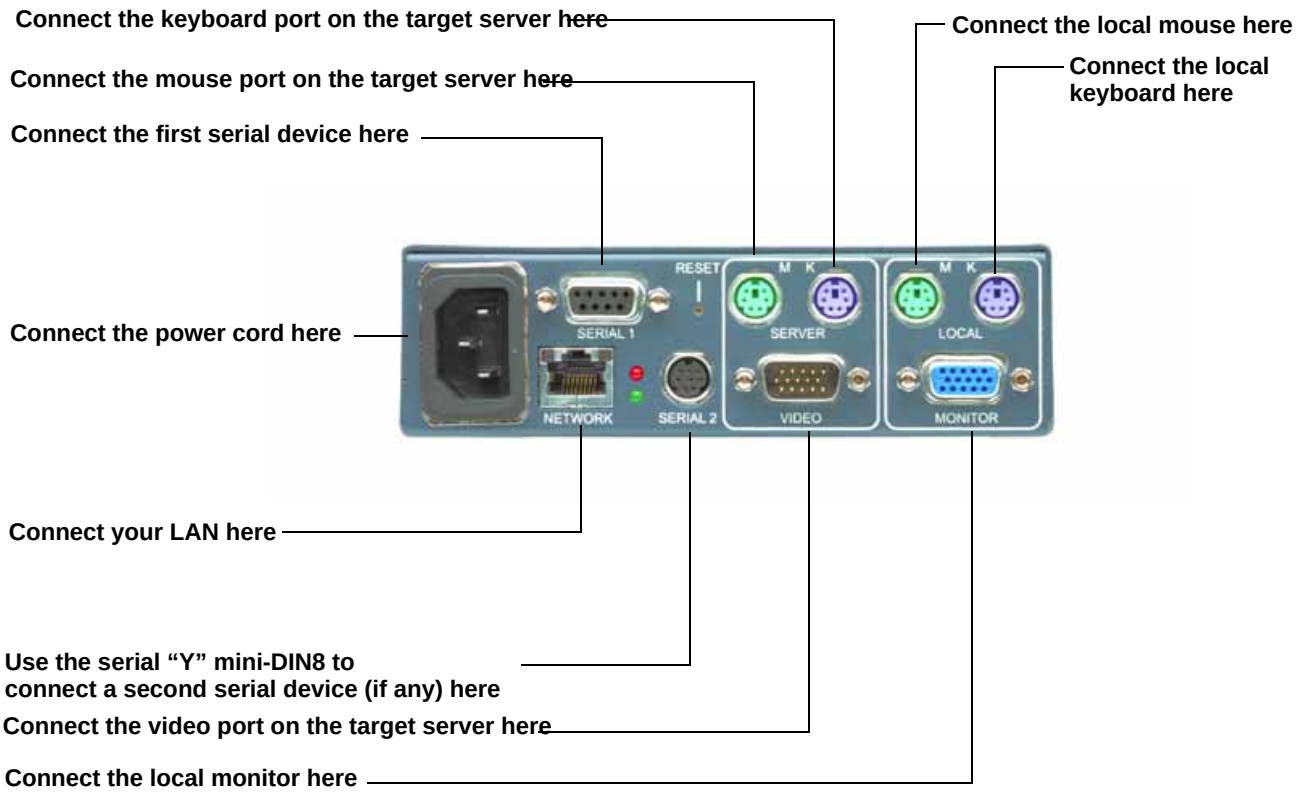


Figure 3-9. SLK8 Connections

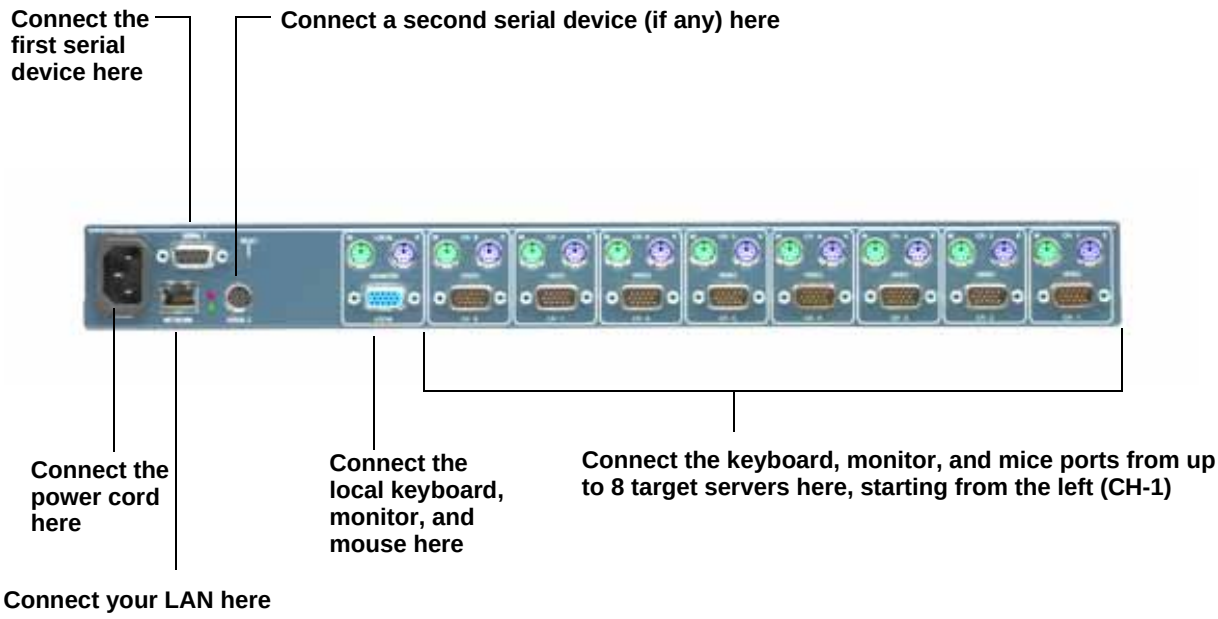
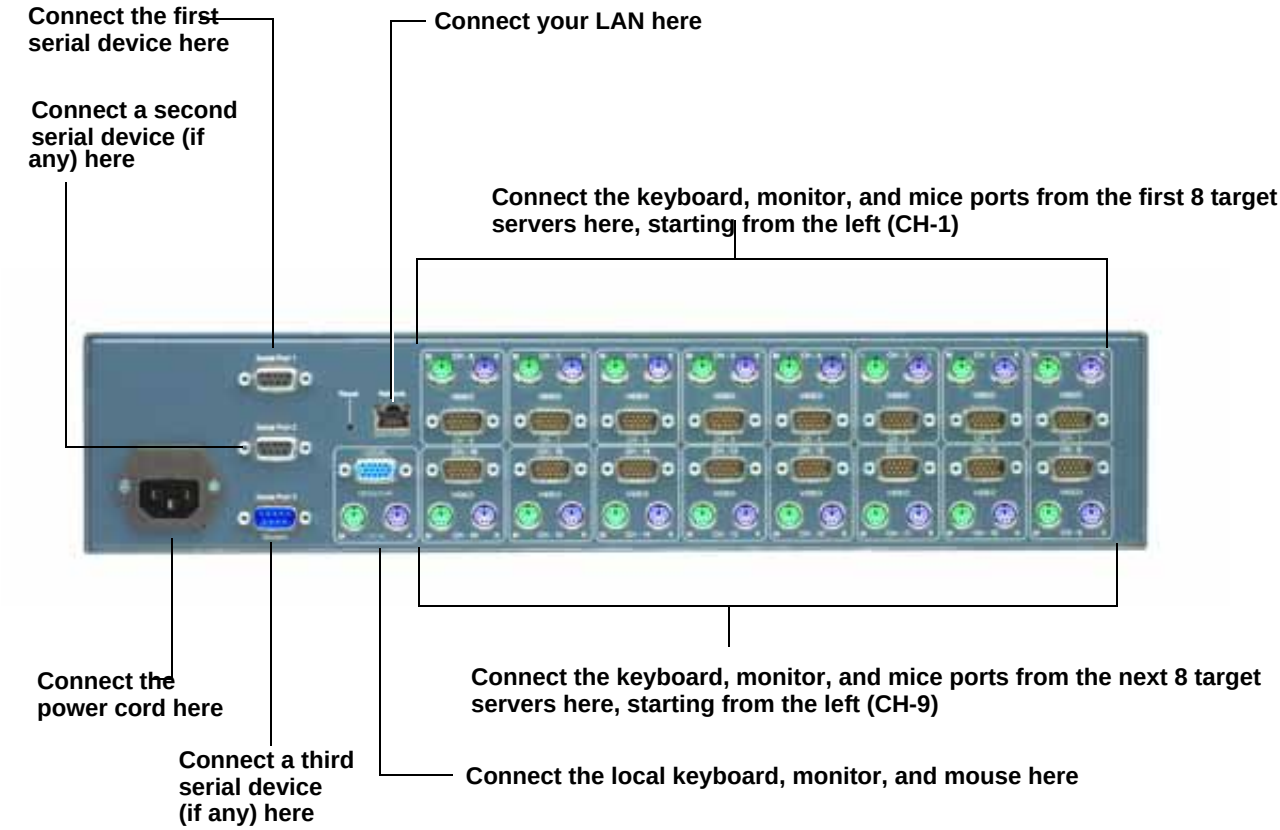


Figure 3-10. SLK16 Connections



Connecting KVM Switches

You can connect KVM switches to the SLK to increase the number of target servers that can be controlled. To connect a KVM switch, attach the mouse, keyboard, and monitor connector from a server port on the SLK to the appropriate uplink connectors on the KVM switch (the manual that came with the KVM switch should describe this procedure). For a list of compatible KVM switches, please visit our Web site at www.lantronix.com.

To optimize the use of KVM switches:

- Disable or time-out any permanent video overlays showing KVM switch status
- Coordinate the defined hotkeys on the SLK or the KVM switch to avoid any conflicts between them. See Chapter 9, “Defining Custom Send Keys”.

Connecting to the Network

After connecting a local console, connect the SLK to your network.

1 Plug one end of an RJ45 cable into the SLK 10/100 BaseT Ethernet port labeled **Network**.

2 Connect the other end of the cable to your network.

Connecting Serial Devices

The SLK back panel provides serial connectors for serial devices to be remotely controlled. All SLK models have two serial ports, labeled **Serial 1** and **Serial 2**.

- **Serial 1** is a DB9 female connector configured as Data Communications Equipment (DCE).
- **Serial 2** (SLK1 and SLK8) is an 8-pin, mini-DIN, female connector configured as DCE. To use this serial port, attach the supplied 8-pin–to–DB9 adapter. On the SLK16, it is a DB9 (just like serial 1).
- **Serial 3** (SLK16) has a third serial port, labeled **Serial Port 3 Modem**. It is a DB9 male connector configured as Data Terminal Equipment (DTE). This serial port supports the Point-to-Point Protocol (PPP). Connecting an external modem to this port allows a remote dial-up client to access the SLK.

Serial port 1 and serial port 2 support the following activities:

- SLK log — relays system log events to a serial device.
- Telnet — lets remote users establish a Telnet session with a serial device through the SLK.

- Watchdog — monitors the status of a server. A server data stream into the serial port is examined for a match with a string pattern that must occur within a set time interval or an alert will be issued. The pattern, interval, and alert are all user-configurable.
- Power Control — connects to an optional Lantronix SLP Remote Power Manager to turn power off or on at the controlled device.

Connecting to a Power Source

To connect the SLK to a power source:

1 Connect the supplied power cord to the SLK AC receptacle.

2 Power-on any KVM switches cascaded in front of the SLK.

3 Power on the SLK followed by attached servers and any converters or extenders.

Validating Target Servers

After you make your SLK connections, use the following procedure to configure the network settings and to validate the performance of the target servers.

1 At the local keyboard, press the 

key twice.

2 When the On Screen Display opens, scroll down to **Setup Menus** and press **Enter**.

3 Select **Network Configuration** and press **Enter**.

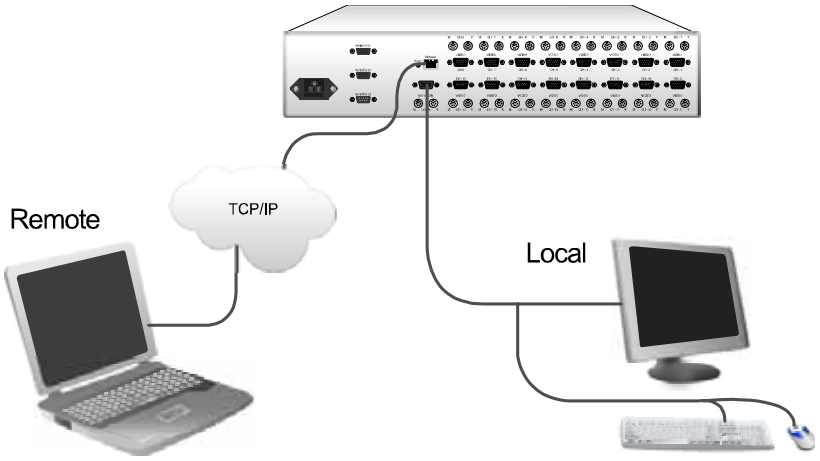
4 From the Network Configuration page, assign an IP address to the SLK. Write down this number. You will need to use it in step 7.

5 If you want the SLK to communicate outside the Local Area Network (LAN), you must set the default gateway.

6 Select **Commit IP config changes** and press **Enter** to commit your changes.

7 Use a PC connected to the network (not the Local Console) to connect to the SLK (see Figure 3-11). Start your web browser and enter the SLK's IP address in the address bar. A screen prompts you for a user name and password.

Figure 3-11. Connecting a Notebook PC to the SLK



8 Type the default user name **root** in lower-case characters and the default password **PASS** in upper-case characters; then click **OK**. The SLK home page opens (see Figure 3-12).

Figure 3-12. SLK Home Page

9 Under **Channel (click to view)**, click the first channel (the channel in the top row). In Figure 3-12, the first channel is **Support PDC** (for demonstration purpose only).

10 Verify that you can view the video (see Figure 3-13). If you can, proceed to the next step. Otherwise, perform the following steps:

- If the video is noisy, click **Blank Screen** in the left pane (under the **Misc** menu) to assess the video noise buildup.
- If the video is not properly detected or is noisy, click **Optimize Video** in the left pane (under the **Advanced** menu) to adjust to the appropriate resolution.
- If none of these suggestions helps, see "Video Troubleshooting" on page 7-8.

Figure 3-13. Example of Viewing Video from a Remote Server

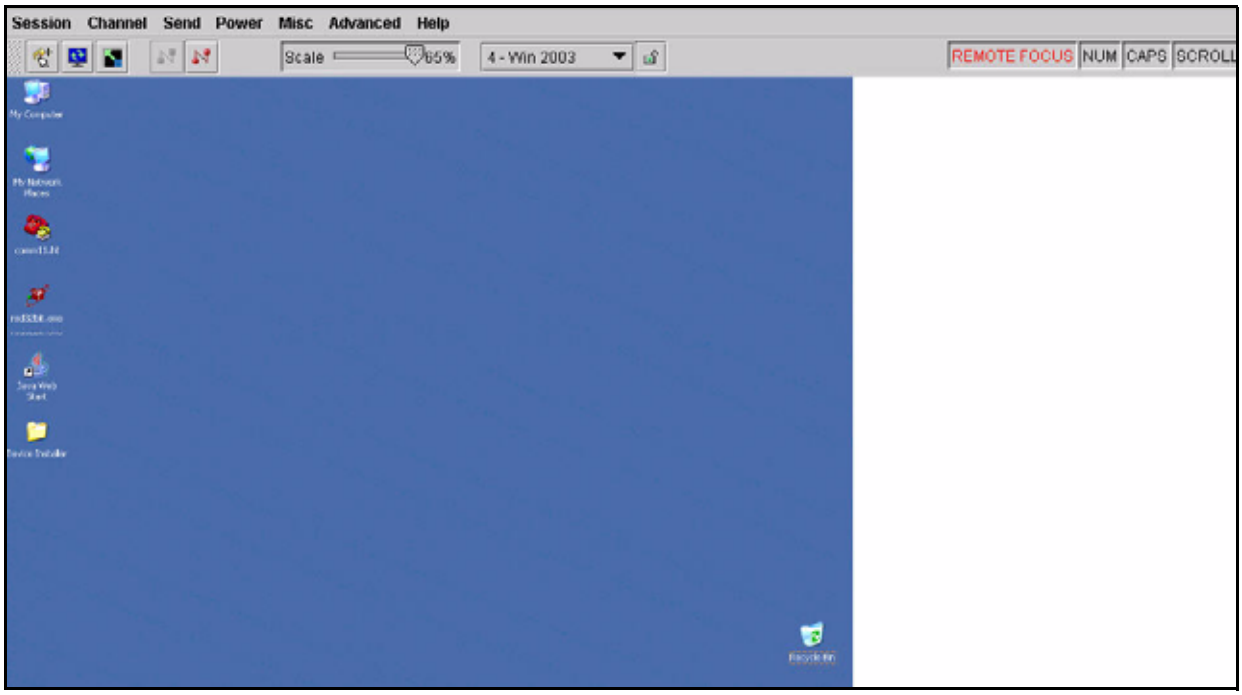
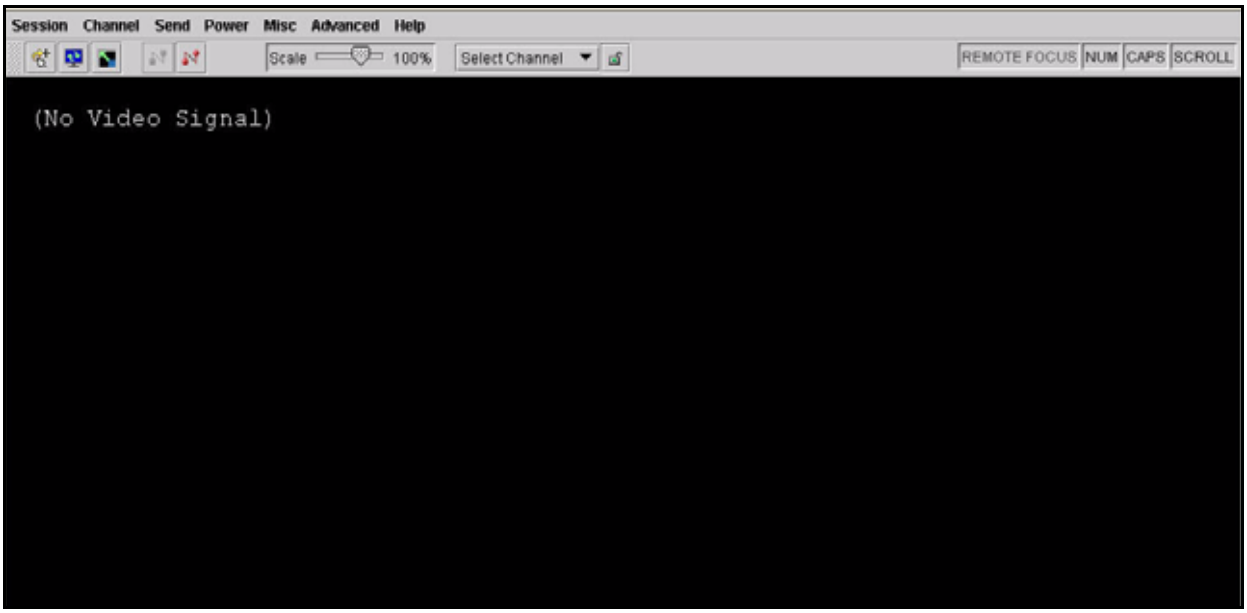


Figure 3-14. Example of No Incoming Video Message



11 Test the mouse and keyboard functionality. If the on-screen pointer moves satisfactorily as you move the mouse, proceed to the next step. Otherwise, click **Resync Mouse** in the left pane (the upper left-most button). Then move the mouse again to see whether the pointer movement has improved. If it has, proceed to the next step. If this does not help, see “Mouse Troubleshooting” on page 7-5. Open a

text-editing application and perform a keyboard functionality test to confirm operation.

12 Click the **Back** button in your browser to return to the SLK home page.

13 Click the channel on the next row and repeat steps 10 through 12. Continue this process for all the remaining channels that are being used.

14 In the left pane, under **Configuration**, click **User Accounts**. The User Accounts screen opens.

15 Enter a new master account password in the first text box. Then enter the same password in the second text box next to it. For security reasons, each typed character appears as a dot.

Note: *Store the new master account password in a safe place. If you lose or forget it, contact Lantronix Technical Support.*

16 Click **Change**.

17 Follow the instructions on the SLK home page to view the current screen contents and take control of the host's keyboard and mouse. You can open a new window to view the screen contents or start a new full screen browser window. You may need to use the 

keys to exit the window.

Note: *For future troubleshooting, see* Chapter 7, "Troubleshooting" on page 7-1*.*

Where to Go from Here

Following the initial configuration and verification, set up users and security parameters.

There are two ways to configure your SLK:

- Using its embedded web control interface.
- Using the local console's On Screen Display (OSD) interface.

The web control interface provides a graphical interface that lets you configure your SLK and control the target servers and other connected devices using a standard web browser. For more information, see Chapter 4, "Using the Web Control Interface to Configure the SLK."

The OSD configuration method provides a text-based interface with minimal prompting and guidance. For more information, see Chapter 5, "Using the OSD Interface to Configure the SLK".

After you configure your SLK, you can:

- Check for updated firmware. See Chapter 8, “Uploading Flash Files and Certificates”.
- Upload the proper encryption certificate and key into the SLK Flash File if you want to use encryption. See “Using Security and Encryption” on page 8-3.

Note: *For answers to frequently asked questions about the SecureLinx SLK Remote KVMs, please visit* www.lantronix.com/support.

4: Using the Web Control Interface to Configure the SLK

This chapter describes how to use the web control interface to configure SecureLinx SLK Remote KVMs and control the attached servers. Topics in this chapter include:

Overview

SecureLinx SLK Remote KVMs provide a graphical, web-based control interface that lets you control servers and other connected devices. This interface is compatible with most standard browsers.

To access the web control interface, your browser must support cookies. The SLK will not start a session until you configure your browser to accept cookies.

Note: *The web pages shown in this chapter are for the SLK16. If significant differences exist between these pages and those of other SLK models, they are identified.*

Starting a Session

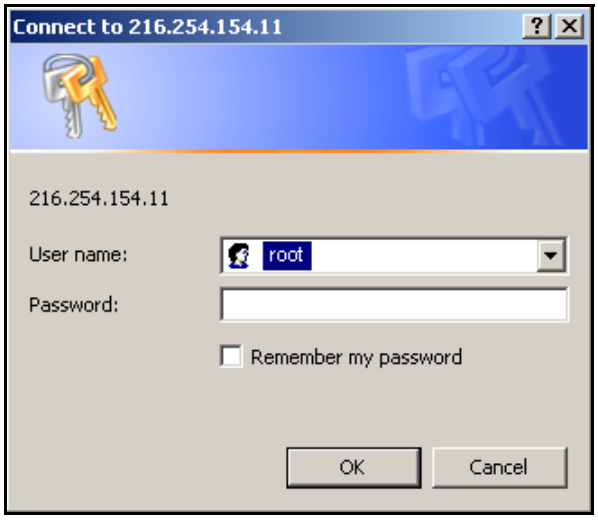
To access the web control interface, use the following procedure:

1 Start a web browser from a computer that is on the same subnet as the SLK.

2 Enter the SLK's IP address into the address bar of your web browser. A login window similar to the one in Figure 4-1 opens. The proper syntax is http://111.222.333.444 (substitute your SLK's IP address for the numeric portion).

Note: *If this procedure fails, ensure that the computer is on the same LAN segment as the SLK and that the SLK does not have an IP address that is already in use by another device on the subnet.*

Figure 4-1. Login Window



3 For **User Name**, type the default user name **root** in lower-case characters.

4 For **Password**, type the default password **PASS** in upper-case characters.

5 Click the **OK** button. The SLK home page displays (see Figure 4-2).

Note: *The following figure is accurate for the SLK16, but not for the SLK8 or SLK1.*

Figure 4-2. SLK Home Page

The home page is your starting location for configuring the SLK and the attached servers. It displays all the channels supported by your SLK and the power status of each. The **Configuration** column provides a **Configure** link that lets you apply configuration parameters you select during your session on a per-channel basis.

At the bottom of the home page are links for starting a new browser window to control a host and starting a new full-screen window to control a host.

You can return to the home page by double-clicking the house icon ( ) above the left menu pane. The next section describes this icon as well as the other components in the web control interface.

Understanding the Web Control Interface

The web control interface consists of a menu pane and a main viewing area. The menu pane is along the left side of the page. It organizes activities into three categories:

- **Operation** — lets you perform various tasks such as controlling and viewing hosts.
- **Configuration** — lets you set up the SLK to suit your requirements. To get the SLK up and running, you must perform two configuration tasks: specify the SLK network settings and set up users.
- **Information** — lets you view information such as menu trees or a connection.

Each category contains links to HTML pages in the SLK's web control interface. These pages cover all aspects of configuration and operation of the target servers and attached devices. For a description of these pages, see Table 4-1 on page 4-6.

Above the menu pane is a home page icon. You can click this icon to return to the SLK home page. To the right of this icon is the **Logout** button. Click this button to log out of the current web control interface session.

At the bottom of each page are a **Home** link for returning to the SLK home page, a **Back** link for returning to the previous page displayed, and a **Logout** link for logging out of the current session. There is also a link to the Lantronix web site.

Note: *In addition to the controls in the web control interface, you can also use the **Back** and **Forward** buttons in your browser to move backward and forward.*

Figure 4-3. Web Control Interface Page Components

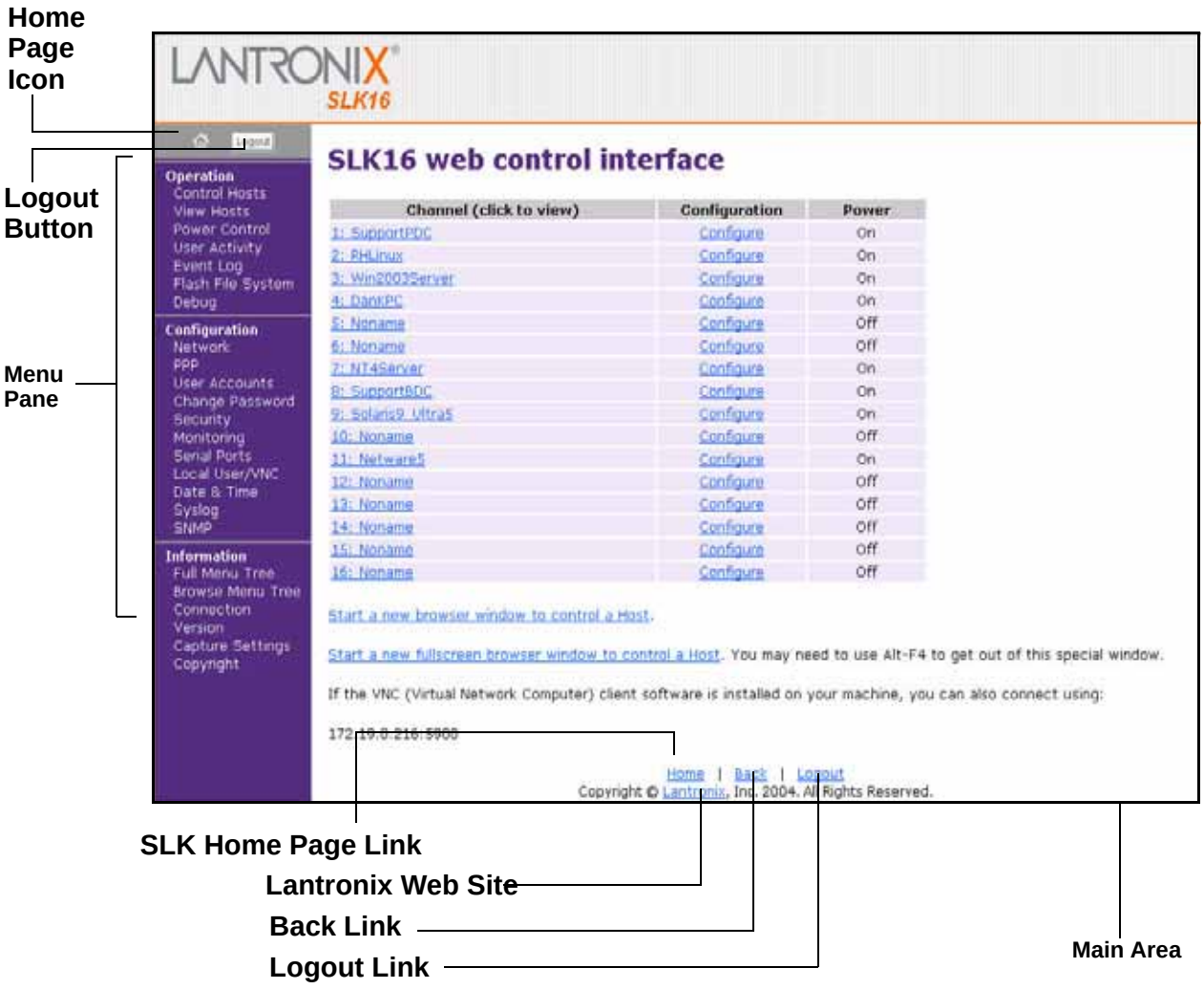


Table 4-1. Web Control Interface Menus

Menu	Description	See Page
Operation		
Control Hosts	Initiates a JavaView session without an active channel being selected.	4-9
View Hosts (SLK16 only)	Displays server desktops in one of the four preset views for monitoring.	4-12
Power Control	Displays channel power outlet names and lets you power-off, power-on, and reset individual outlets, if an optional SLP Remote Power Manager is installed and configured on a serial port.	4-13
User Activity	Displays the user activity history (for example, user name, session type, login and idle times, and IP information).	4-14
Event Log	Displays the event log history.	4-16
Flash File System	Displays a list of internal SLK system files and applets used to upgrade these files. Provides access to keyboard/mouse emulation firmware and tools to save or reload system configuration.	4-17
Debug	Helps you to reset, maintain, and to calibrate video and keyboards, and load configuration files. This option is for Technical Support use only.	4-18
Configuration		
Network	Helps you to understand and configure the network connection.	4-19
PPP	Lets you set up a dial-up modem as a backup strategy.	4-21
User Accounts	Displays user names, passwords, and account information and lets the Administrator set user-access privileges for each channel.	4-23
Change Password	Enables users to change their own passwords.	4-28
Security	Sets profiles and policies for logout time, Turtle, Stealth, and other functions.	4-29
Monitoring	Sets error conditions and responses.	4-35
Serial Ports	Sets operating mode, baud rate, power, and other serial port functions.	4-37
Local User/VNC	Sets VNC port, mouse threshold, and exit key for OSD as well as VNC.	4-39
Date and Time	Sets the SLK internal clock and time zones to the remote values.	4-41
Syslog	Lets you set the configuration of basic Syslog parameters.	4-41
SNMP	Lets you to control the SNMP agent running in the SLK.	4-43
Information		
Main Menu Tree (SLK1 and SLK8 only)	Displays a representation of the OSD menu.	—
Full Menu Tree (SLK16 only)	Displays an expanded menu of SLK functions and current settings.	4-45

Table 4-1. Web Control Interface Menus

Menu	Description	See Page
Browse Menu Tree (SLK16 only)	Displays a representation of the OSD menu.	4-46
Connection	Displays miscellaneous installation and SSL information.	4-47
Version	Displays serial numbers and versions for your installation.	4-48
Capture Settings	Shows a snapshot of the system log and settings in text format.	4-49
Copyright	Shows the Open SSL encryption copyright requirements.	4-50

Performing Operation Activities

SLK operation activities can be performed using the links under **Operation** in the menu pane of the web control interface. Table 4-2 lists the SLK operation activities.

Table 4-2. SLK Operation Activities

Menu	Description	See Page
Control Hosts	Initiates a JavaView session without an active channel being selected.	4-9
View Hosts (SLK16 and SLK8 only)	Displays server desktops in one of the four preset views for monitoring.	4-12
Power Control	Displays channel power outlet names and lets you power-off, power-on, and reset individual outlets, if an optional third-party power control unit is installed and configured on a serial port.	4-12
User Activity	Displays the user activity history (for example, user name, session type, login and idle times, and IP information).	4-13
Event Log	Displays the event log history.	4-14
Flash File System	Displays a list of internal SLK files.	4-16
Debug (SLK16 only)	Helps you to reset, maintain, and to calibrate video and keyboards, and load configuration files.	4-17

Controlling Hosts

The **Control Hosts** link lets you view and control a server desktop. **Control Hosts** is functionally equivalent to clicking a server in the **Channel** column on the SLK home page.

Note: *If* ***NO INCOMING VIDEO*** *appears, see* "Video Troubleshooting" on page 7-8*.*

You perform tasks on this page using the menus, icons, and buttons at the top of the page. The REMOTE FOCUS indicator normally is red; however, it turns gray if the remote cursor is moved off the server desktop.

For a description of the menus, icons, and buttons, see Table 4-3 on page 4-10.

Figure 4-4. Example of Controlling a Host

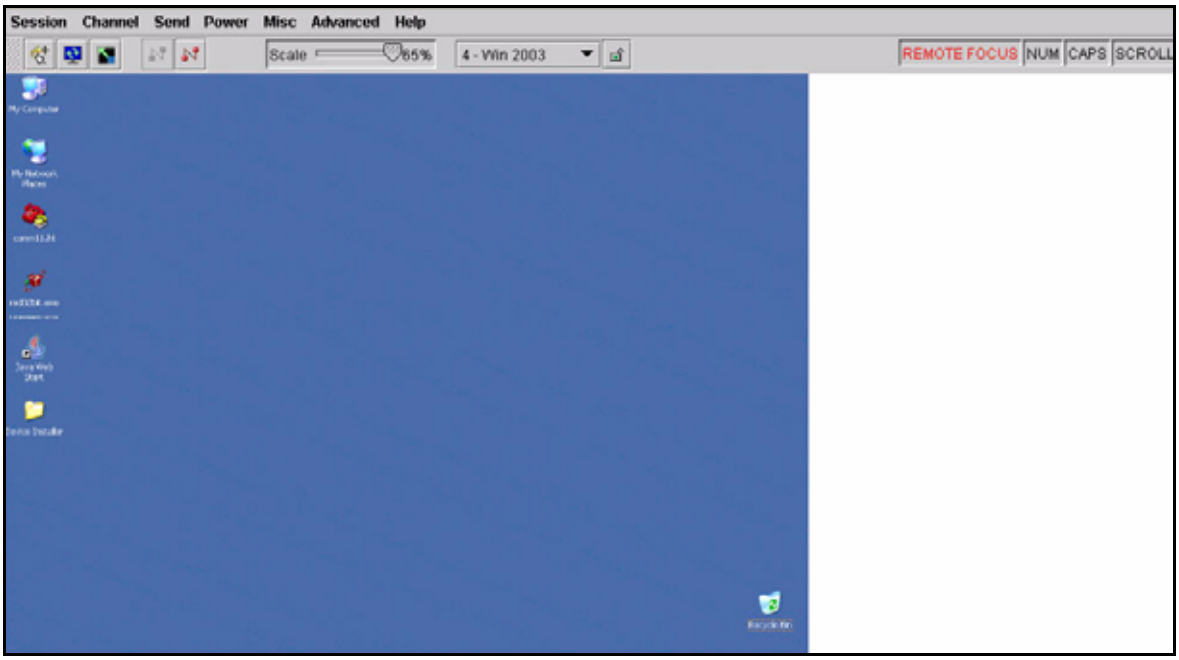


Table 4-3. Menus, Icons, and Buttons

Menu Item	Description
REMOTE FOCUS	Status indicator; turns gray when the mouse leaves the active server desktop
Session-->	Provides session management options.
Connect 	Restores the connection if the connection was disconnected.
Disconnect 	Disconnects from the server you were viewing.
SSL	Lets you encrypt SLK transmissions (with certificate and access key installed). Encryption levels vary depending on the Security settings selected.
Channel 	(Does not apply to SLK1.) Lets you choose a channel (server) from the drop-down list. Names represent servers and KVM switches.
Send-->Send Keys	Send Keys are a set of pre-defined keystroke combinations to perform specific functions.
Send-->Custom Keys	Allows redefinition of Send Keys if attached devices require key combinations not included in the default Send Keys definition. See Chapter 9, “Defining Custom Send Keys” .
Power--> Cycle power Power off Power on	Shows choices on an optional power control unit. Power control requires installation of an optional SLP Remote Power Manager.
Misc	
Resynchronize Mouse 	Lets you reset the local mouse cursor to more closely follow crosshairs of remote mouse.
Refresh Entire Screen 	Refreshes the screen.
Blank Screen	Clears the screen so you can better detect whether you are receiving system noise.
Release the CTRL, ALT, and SHIFT keys	Releases you from the states in which **Ctrl, Shift**, or **Alt** are always on.

Table 4-3. Menus, Icons, and Buttons

Advanced	
Color Depth	Allows the user to select either 8-bit or 16-bit color mode.
Position Calibration 	Allows remote users to choose between manual and automatic positioning of the server screen. (This feature may not function properly with a black desktop background.) The icon automatically calibrates the screen position.
Redetect Video	Prompts the SLK to redetect the video signal.
Optimize Video	Applies an algorithm to sharpen the image or correct for noisy images.
View Current User	(SLK16 only) Shows which users are logged into which channel.
Lock this channel 	Locks the channel, preventing access by other users, including local users. Administrator can override by closing this session and user activity, (SLK16 only.)
Auto-Scaling	Dynamically resizes the viewing area so that remote users can see the entire desktop of the server being accessed.
Performance monitor	Provides real-time bandwidth usage measurement.
Help	Provides software version information.
	Resizes the active server window.
NUM	When bold, indicates that **Num Lock** is on.
CAPS	When bold, indicates that **Caps Lock** is on.
SCROLL	When bold, indicates that **Scroll Lock** is on.

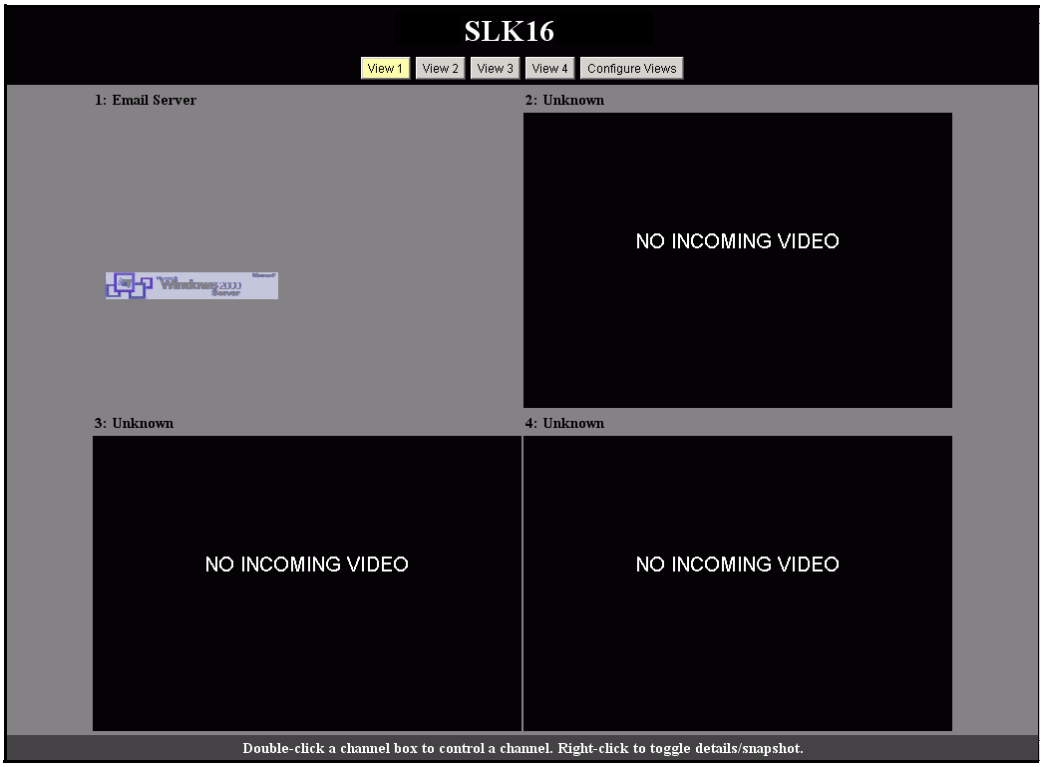
Viewing Hosts

The **View Hosts** link lets SLK16 users view the maximum number of channels supported by the SLK16. (This feature is not available with the SLK1 and SLK8.)

- SLK1 users can store the desktop view for one channel.
- SLK8 users can view all channels from one screen.
- SLK16 users can store up to four sets of channels, each of which can contain 1 to 16 desktop views.

You can right-click any channel to see video data such as 1024x768@60Hz and double-click any channel to control it.

Figure 4-5. Viewing Hosts



Note: *The SLK1 and SLK8 View Host function pauses when a remote session is in progress. Several such sessions can be created from different locations. The SLK16 View Host function is independent of a remote session in process because of the dedicated hardware for this functionality. Also, multiple View Host sessions at different locations and six remote sessions can be supported simultaneously.*

The SLK16 View Host function remains interactive regardless of remote sessions in process. Multiple View Host sessions do not interfere with the SLK's ability to support six concurrent remote sessions.

Using Power Control

The **Power Control** link provides on/off/reboot control of attached systems when an SLP Remote Power Manger is attached to the SLK. You must attach a serial cable (Appendix A:, Specifications) between a serial port on the SLK and the serial (serial, RS-232) port of the SLP, and configure the SLK serial port for “Power Module,” before you can control power to the attached systems.

Figure 4-6. Power Control with an Optional SLP Remote Power Manager

This page gives you control over the power status of all IT equipment connected to the SLK. In particular:

- **Power Reset** (power cycling) lets you remotely force a reboot on a server.
- **Synchronize all outlet names** lets you name the outlet names identical to the channel names.

Note: *If you assign the same name to two devices, Power Control turns them on and off at the same time.*

Performing User Activity Functions

The **User Activity** link lets you view which users are currently logged into the SLK. When the User Activity page appears (see Figure 4-7), you can click a slot number link to terminate the corresponding session. (System administrator only.)

The maximum number of users that can be logged in varies by model.

The maximum number of sockets is limited to 32 slots for remote activity (web, telnet, VNC, Java). When filled, the one with the longest timeout is terminated and recycled. Sessions are also terminated when logout is done properly or timeout is reached.

- SLK1 and SLK8: Up to 10 remote users can start a session to use the web control interface pages without viewing video. These users are “active” or logged on, but not considered when counting the single user viewing or controlling servers.
- SLK16: Up to 32 remote users can start a session to use the web control interface pages without viewing video. These users are “active” or logged on, but not considered when counting the number of users (up to 6) viewing or controlling servers.

Note: *Users can log in multiple times (up to 32 logins). When a user logs out of a session, only that session closes, not all sessions associated with that user. Therefore, check for a duplicate* ***Name*** *or* ***Remote IP*** *on this page. Logging in multiple times reduces the number of available sessions. Setting the idle time-out to a low value such as 10 minutes reduces exposure to this situation. (This can be done on the Security page.)*

Figure 4-7. User Activity Page

Note: *For the SLK1 and SLK8, the title of this page is "Who's logged in," and it does not have a Channel column.*

Viewing the Event Log

The **Event Log** link lets you view system messages. Figure 4-8 shows an example of the event log. To clear the events in the log, click the **Clear log contents** button.

Event logs are stored in volatile memory and are cleared when the SLK is reset. Use syslog to capture and store event logs. (See “Configuring Syslog Parameters” on page 4-41.)

Note: *For the SLK1 and SLK8, the title of this page is “System Log History.”*

Figure 4-8. Event Log

Flash File System

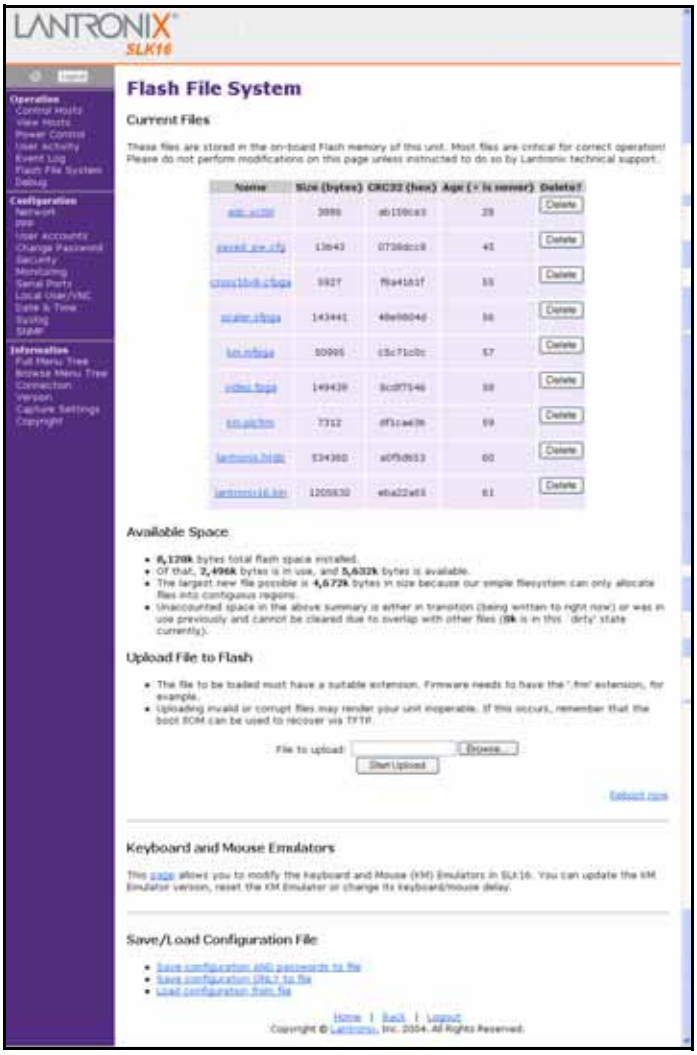
The **Flash File System** link displays the Flash File System page (see Figure 4-9). From this page, you can open or delete files critical to the operation of the SLK. These files are stored in the SLK on-board Flash memory.

Because most of these files are critical for correct operation, do not perform modifications on this page unless instructed to do so by Lantronix Technical Support.

The Flash File System page also lets you upload new firmware and certificates. For more information, see Chapter 8, “Uploading Flash Files and Certificates’.

Note: *For the SLK1 and SLK8, the title of this page is “Internal Flash File System.”*

Figure 4-9. Flash File System



The **Keyboard and Mouse Emulators** link (SLK16 only) enables you to control keyboard and mouse timing. This function is useful for fine tuning compatibility, resetting the emulation, and upgrading the emulation software.

Keyboard and mouse emulation firmware can be upgraded on a “per-port” basis.

***Warning:* When upgrading a port’s keyboard and mouse emulation, all keyboard and mouse signaling is lost, and the attached server sees this as a disconnect. It is preferable for the attached server to be shut down during this process. Otherwise, a server reset may be required.**

The Save/Load Configuration File link allows you to save and load configurations into a file in Flash. The file can be downloaded, uploaded, and edited for configuring multiple units with same or similar settings.

Debug (SLC16 only)

The **Debug** link (on the SLC16 only) lets you perform maintenance and calibration activities.

Do not perform modifications on this page unless instructed to do so by Lantronix Technical Support.

Figure 4-10. Debug Menu Page

Performing Configuration Activities

SLK configuration activities can be performed using the links under **Configuration** in the menu pane of the web control interface. Table 4-4 lists the SLK operation activities.

Table 4-4. SLK Configuration Activities

Menu	Description	See Page
Network	Helps you to understand and configure the network connection.	4-19
PPP (SLK16 only)	Lets you set up a dial-up modem as a backup strategy.	4-21
User Accounts	Displays user names, passwords, and account information and lets the Administrator set user-access privileges for each channel.	4-24
Change Password	Enables users to edit their own passwords.	4-28
Security	Sets profiles and policies for logout time, Turtle, Stealth, and other functions.	4-29
Monitoring	Sets error conditions and responses.	4-35
Serial Ports	Sets operating mode, baud rate, power, and other serial port functions.	4-37
Local User/VNC	Sets VNC port, mouse threshold, and exit key for OSD as well as VNC.	4-39
Date & Time	Sets the SLK internal clock and time zones to the remote values.	4-41
Syslog	Lets you set the configuration of basic Syslog parameters.	4-41
SNMP	Lets you control the SNMP agent running in the SLK.	4-43

Specifying the SLK Network Configuration

The **Network** link lets you specify SLK network configuration information (see Figure 4-11). Network configuration information consists of the SLK's IP address, subnet mask, default gateway, and machine name.

Before you can access the SLK through the web control interface, you must specify the SLK's IP address, subnet mask, and default gateway using the local console. This task should have been completed during the initial configuration of the SLK. Thereafter, you should only need to modify this information if these settings conflict with another device on the network or if you move the SLK to a different network.

Figure 4-11. Network Configuration Page

To change the network information, use the following procedure:

1 Close all remote user sessions. Otherwise, the sessions lock up and become unavailable to remote users. If this happens, perform a warm reset of the SLK from the Debug menu of the OSD. (Debug is available from the OSD on all models. Only the SLK16 has it as a web choice as well.)

2 In the menu pane, click **Network** under **Configuration**. The Network Configuration page appears.

3 To change the IP address, enter the appropriate new address in the **IP Address** field and click the **Apply** button next to this field. This is the address you enter in your web browser to access the web control interface. To enable DHCP, type **DHCP** or **0.0.0.0** in the IP address section.

Note: *The IP address must uniquely identify the SLK. Be sure no other device on the subnet has this IP address.*

4 To change the subnet mask, enter the appropriate new one in the **Subnet mask** field and click the **Apply** button next to this field. This value must match the subnet mask used on the LAN.

5 To change the default gateway, enter the appropriate new address in the **Default Gateway** field and click the **Apply** button next to this field.

6 To change the machine name, enter a name that will uniquely identify this device on the network and click the **Apply** button next to this field. The machine name can be an alphanumeric string up to 15 characters long.

7 Once changes to all individual fields have been made, click **Commit IP Config Changes** to have the changes take effect. If you omit this step, the new settings take effect the next time the unit reboots.

Note: *If the configured gateway is not on the same LAN segment as the IP address and subnet mask specified, the SLK calculates an appropriate gateway using standard network numbering conventions.*

Configuring PPP Settings

The Point-to-Point Protocol (PPP) is an out-of-band communication channel that allows dial-in access to the SLK16. If you have an SLK16 with a modem connected to serial port 3, you can use the **PPP** link to configure the following PPP options. After you select your options, click the **Apply** button to initialize them. Once PPP is established, to access the SLK, use a browser, Java, VNC, or Telnet as usual.

Note: *The **PPP** link does not apply to the SLK1 and SLK8.*

IP Addressing

- PPP Local IP address — the IP address that is assigned to the PPP interface of the SLK16.
- PPP Remote IP Address — the IP address assigned to the dial-up client once attached and authenticated.

Authentication

- User Name — the user name (or peer name) used for authentication when a client dials in.
- Password — the password (or secret) used for authentication.
- PPP Authentication Protocol — the authentication protocol used for PPP. You can select **CHAP** (Challenge Handshake Authentication Protocol), **PAP** (Password Authentication Protocol), or **None**.

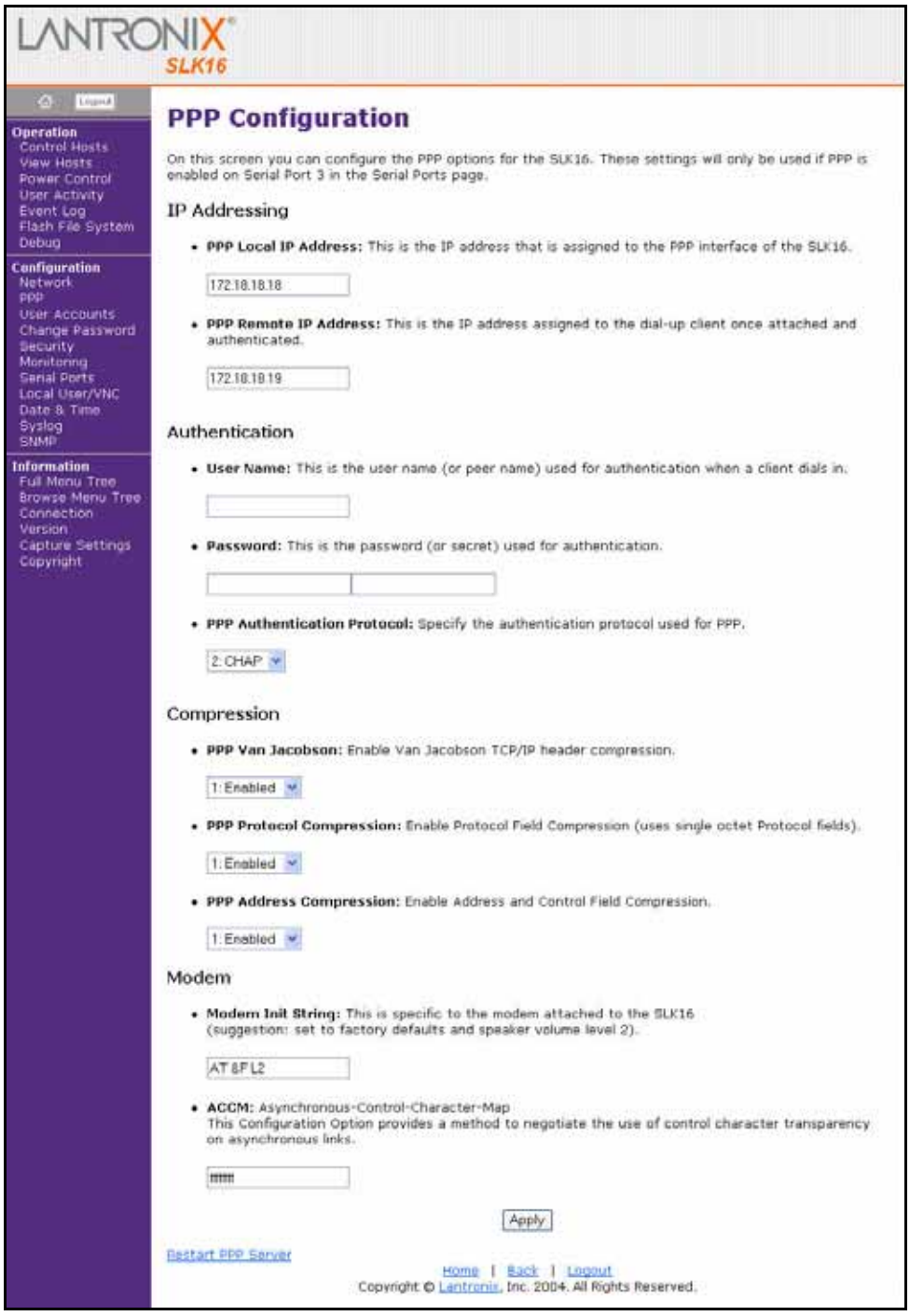
Compression

- PPP Van Jacobson — lets you enable or disable Van Jacobson TCP/IP header compression.
- PPP Protocol Compression — lets you enable or disable Protocol Field Compression (uses single octet Protocol fields).
- PPP Address Compression — lets you enable or disable Address and Control Field Compression.

Modem

- Modem Init String — an initialization string specific to the modem attached to the SLK16. We recommend you set this string to factory defaults and set the modem speaker volume to level 2.
- ACCM — Asynchronous-Control-Character-Map. Provides a way to negotiate the use of control character transparency on asynchronous links.

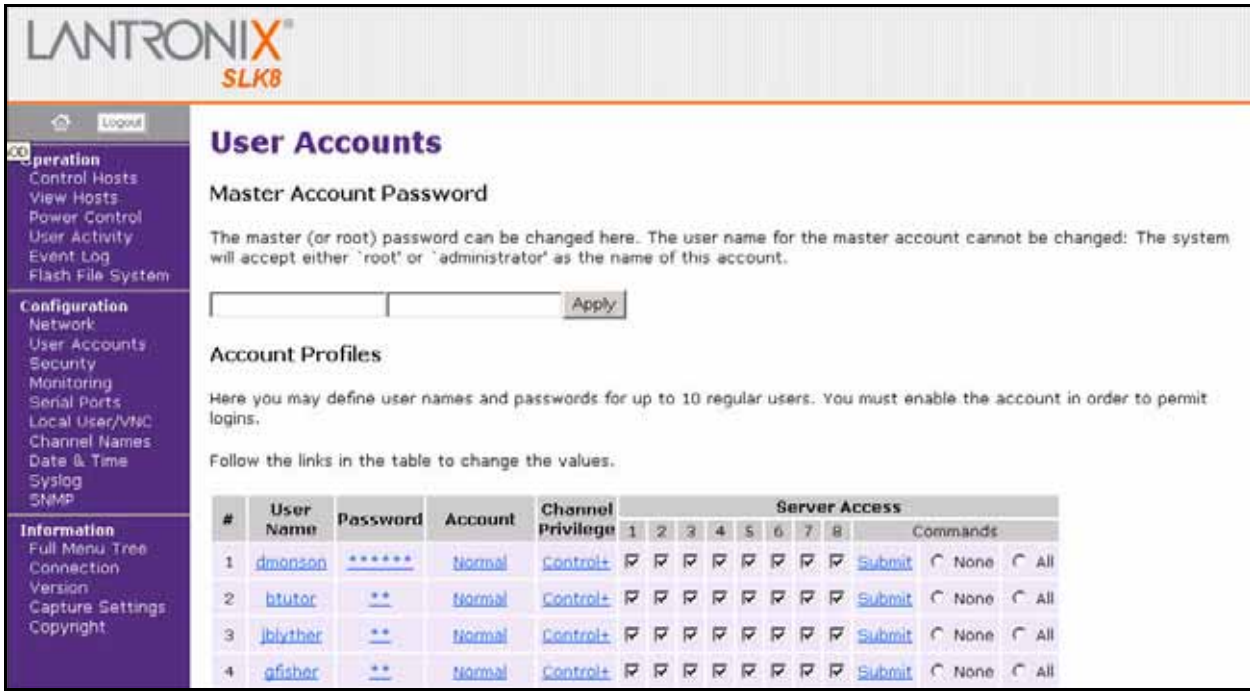
Figure 4-12. PPP Configuration Page



Setting Up User Accounts

The User Account link allows the administrator to specify users, assign permissions, and allocate access (see Figure 4-13). User accounts must be defined before remote (web) sessions are available.

Figure 4-13. User Accounts Page



The User Accounts page lets you:

- Change the master account password.
- Define user accounts (normal or administrator).
- Set user names, passwords, and flags.
- Select the servers that users can access and not access (available on SLK 8 and **SLK16).**

Changing the Master Account Password

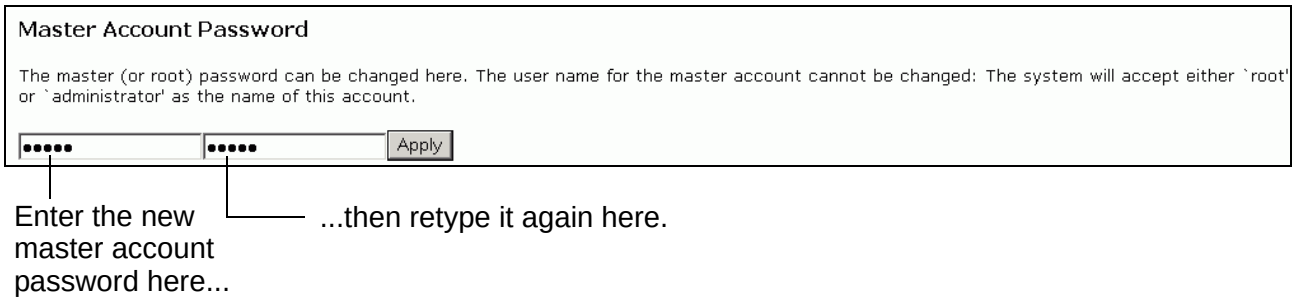
The master account password is the password you enter to perform Administrator activities using the web control interface. The default password is **PASS**. For security purposes, we recommend you change it. This step should have been completed during the initial configuration of the SLK. If not, or if you want to change it again, perform the following procedure.

1 In the menu pane, click **User Accounts** under **Configuration**. The User Accounts page appears.

2 Under **Master Account Password**, type the new master account password in the left field; then retype it in the right field (see Figure 4-14).

Note: *The master account password is case-sensitive. For security purposes, each typed character appears as a dot (•).*

Figure 4-14. Entering a Master Account Password



3 Click the **Apply** button next to the right field.

4 Record the new master account password for future use.

Warning: ***The master account password can be changed on the local console if access is left shared. If the local console is locked and the password is lost, the only method to reset the password is by sending the unit back for factory reset. An invoice will be required and a surcharge will apply. Please do not lose the password, or leave the local console unlocked (unless keeping it locked is critical.)***

Setting Up User Accounts

Before users can access the target servers, you must set up an account for them. When you set up a user account, you:

- Specify the user name and password the user must enter before accessing a server.
- Enable the user account.
- Specify the channel privileges, if any, for a user.
- Select which target servers, if any, the user can access.

To define user accounts, use the following procedure:

1 If the User Accounts page is not displayed, click **User Accounts** under **Configuration** in the menu pane.

2 Each row under **Account Profile** belongs to a different user. Find the row that corresponds to the user you want to configure. If you are setting up users for the first time, start with the user on the top row.

3 To change the user ID, click the link under **User Name**. A page similar to the one in Figure 4-15 appears. Enter a user ID for the user and click the **Apply** button. When the User Accounts page returns, the updated value displays.

Figure 4-15. Page for Changing a User ID

4 To assign a password to the user, click the link under **Password**. A page similar to the one in Figure 4-16 appears. Enter a password for the user in the left field, type it again in the right field, and click the **Apply** button. When the User Accounts page returns, the updated value displays.

Note: *For security purposes, each typed password character appears as a dot (•) in the page where you enter the password and as an asterisk in the User Accounts page.* ***User passwords are case-sensitive; user names are not.***

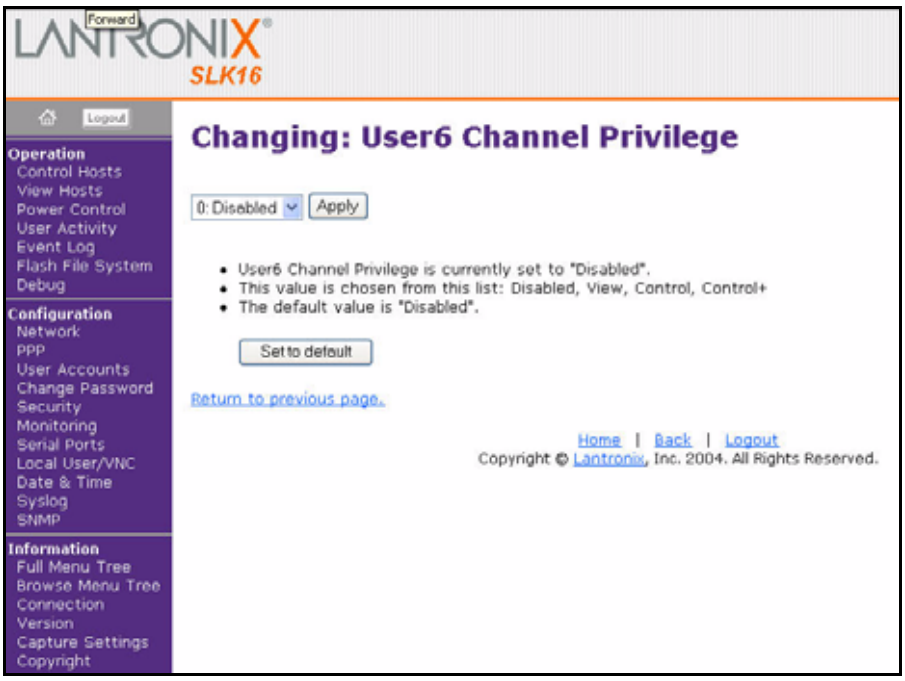
Figure 4-16. Page for Changing a User Password

5 To change the user account status, click the link under **User Account**. A page similar to the one in Figure 4-17 appears. Click the appropriate user account type and click **Apply**. When the User Accounts page returns, the updated value displays.

The types of user accounts are:

- **0: Disabled** — user account is disabled.
- **1: Normal** — view and control access to target server(s).
- **2: Administrator** — view and control access to target server(s) and all configuration parameters.

Figure 4-17. Page for Changing User Channel Privileges



6 To change the user's channel privileges, click the link under **Channel Privilege**. A page similar to the one in Figure 4-17 opens. Select the appropriate privilege and click **Apply**. When the User Accounts page returns, the updated value displays.

The types of user channel privileges are:

- **0: Disabled** — user's channel privileges are disabled.
- **1: View** — user can only view channel information.
- **2: Control** — user can view and change channel information.
- **3: Control+** — use can view and change channel information and has additional privileges, such as viewing and changing power switching. Changing power switching is performed using an optional Lantronix SLP Remote Power Manager.

Note: *This numbering is correct for the SLK16, but is different on the SLK1 and SLK8.*

7 SLK8 and SLK16 users: To select the servers that the user can access, check the servers under **Server Access**. If you change your mind about granting the user access to a server, uncheck the server.

Note: ***None*** *and* ***All*** *under* ***Commands*** *can be used as shortcuts for selecting the servers that a user can access.*

8 After making your selections, click the **Submit** link under **Commands** to submit your selections for this user.

9 Repeat steps 3 through 8 for each additional user account.

Changing Your Own Password

The Change Password link lets users change their own passwords. This password is specific to the user and affects only their access to the SLK.

1 Click **Change Password** in the menu pane. The Change My Password page displays.

Figure 4-18. Page for Changing Your Own Password

2 In the **New Password** field, type a new password.

3 In the **Confirm Password** field, type the same new password.

4 Click the **Change** button.

Configuring a Security Policy

The **Security** link lets you define a security policy for the SLK. Clicking this link displays a page with a summary of preset security profiles, buttons for selecting a security policy, and controls for customizing security parameters (see Figure 4-19). Using this page, you can set optional security parameters, configure ports, and set local security controls.

Figure 4-19. Security Policy Configuration Page (Security Profiles and Policy)

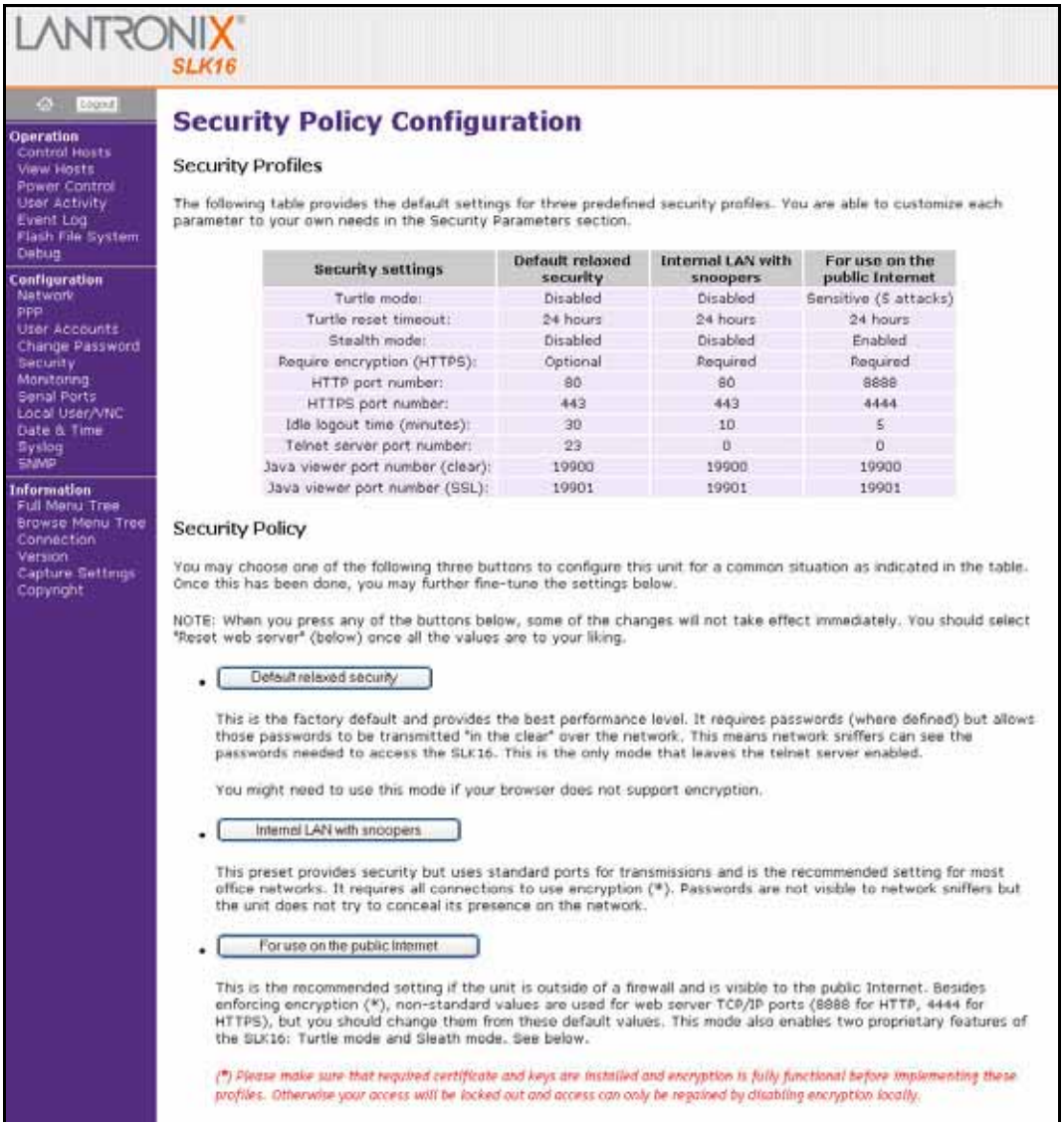
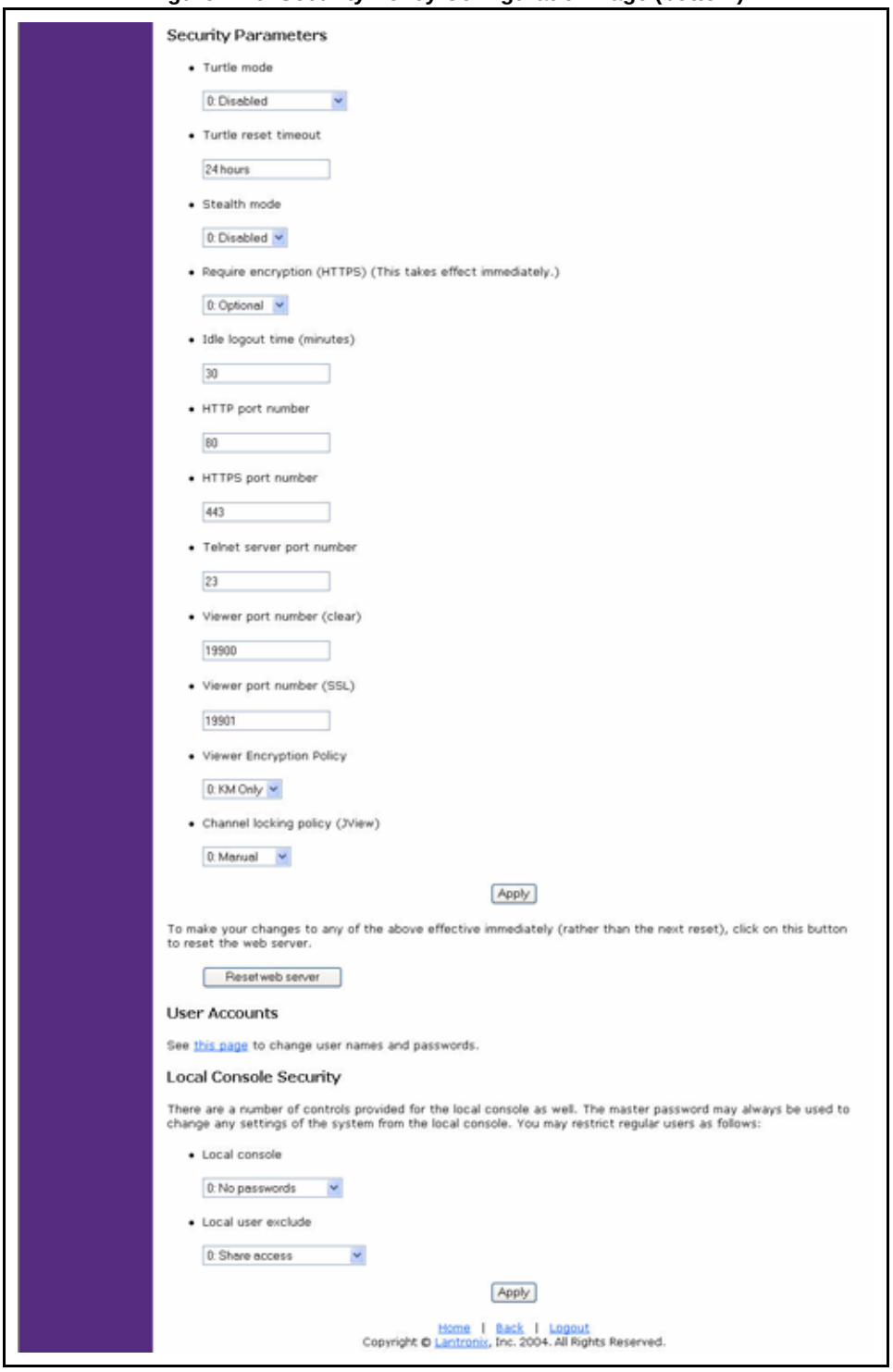


Figure 4-20. Security Policy Configuration Page (bottom)



Security Profiles

This area shows security settings for three pre-defined profiles. You use the buttons in the **Security Policy** area to select the profile you want to use.

Security Policy

The **Security Policy** area allows an Administrator to select from the three pre-defined levels of security shown in the **Security Policy** area. The Administrator can customize these profiles to suit the security needs of the network. Click the **Reset Web Server** button only after all fine-tuning is done.

Default Relaxed Security

This is the factory default. It requires passwords (where defined) but allows those passwords to be transmitted “in the clear” over the network. This means network sniffers can see the passwords needed to access the SLK unit. This is the only mode that leaves the Telnet server enabled. You will need to use this mode if your browser does not support encryption.

Internal LAN with Snoop-ers

This is the recommended setting for most office networks. It requires all connections to use encryption. Passwords are not visible to network sniffers, but the unit will respond to Ping and does not try to conceal its presence on the network.

For use on the Public Internet

This is the recommended setting if the unit is outside of a firewall and is visible to the public Internet. Non-standard values are used for web server TCP/IP ports (8888 for HTTP, 4444 for HTTPS), but you should change them from these default values. This mode also enables two proprietary features of the SLK: Turtle mode and Stealth mode.

Security Parameters

The **Security Parameters** area lets you fine-tune the parameters in your profile to suit the requirements of the network.

Turtle Mode

Turtle mode enables the SLK unit to shut down network access when it senses that it is under attack and security may be compromised. For example, if more than five password failures are detected before a successful login, the SLK unit disconnects itself from the network. In this state, remote access to the SLK unit is completely locked out. However, the operation of the attached server(s) is not affected. To regain network access, the turtle mode timeout period must be fulfilled, or an administrator must log in from the local port and issue a reset command via the OSD.

Turtle mode provides a rapid security barrier, but it can make the SLK susceptible to denial-of-service attacks. Consequently, this mode is not enabled by default. When Turtle mode is enabled, a default timeout value of one hour is set. This value can be configured to suit administrative needs.

Stealth Mode

In Stealth mode, the SLK unit deliberately disables certain TCP/IP protocol functions to conceal its presence on a network. This mode attempts to make the SLK invisible to a “port scan” attack. When Stealth mode is enabled, the SLK will not respond to ICMP PING requests, and Broadcast TCP/IP connection requests to any/all unused ports will go unanswered and will not elicit the expected “connection refused” response. For optimum security, the administrator should change the web server port number from the default setting.

Stealth mode ensures that operation of the SLK unit by legitimate users who can correctly specify both the IP address and web server port number will be normal. At the same time, it prevents intruders who cannot accurately guess both the IP address and port number from gaining access.

Encryption Required

This option takes effect immediately. For this feature to work, install a valid server certificate and key provided by a trusted source into the device. The certificate and key must be of the PEM format and the name of the files should be “server-cert.crt” and “server-cert.key.”

To install the certificate and key, you must access the “manage flash file system” through the device’s web browser and upload the certificate and key through the browser. A reset through the reset link on the Flash File System page has to be performed to allow the device to load the new certificate and key and delete any old ones in the system. For more information, see Chapter 8, “Uploading Flash Files and Certificates” .

If you are using a browser, you must have the Sun Java Plug-in 1.4.0 or higher installed. SSL is not available through VNC.

Idle Logout Time

The default Idle Logout Time is 30 minutes. To change, enter a new number of minutes.

HTTP Port Number

The default HTTP Port Number is 80. To change, enter a new HTTP port number.

HTTPS Port Number

The default HTTPS Port Number is 443. To change, enter a new HTTPS port number.

Telnet Server Port Number

The default Telnet Server Port Number is 23. To change, enter a new Telnet server port number. To disable, set the Port Number to zero.

Viewer Port Number (Clear)

The default Java Viewer Port Number is 19900. To change, enter a new Java Viewer port number.

Viewer Port Number (SSL)

The default Java Viewer Port Number for secure connections is 19901. To change, enter a new Java Viewer port number.

Applying Changes

If you change any security parameter settings except **Require encryption**, click the **Apply** button to apply them. This area also provides a **Reset web server** button you can click to put your changes into effect immediately, rather than after the next reset.

User Accounts

The **User Accounts** area provides a link that lets you configure user accounts. For more information, see “Setting Up User Accounts” on page 4-24.

Local Console

Local Console Security

The **Local Console** area lets you change the local console security level. Requiring a password restricts all but the root used account from the local console. This does not affect the passwords used for remote access.

Local User Exclude

This option lets you select the following parameters:

- **0: Share access:** Local user can type when the remote user is connected and also controlling the same machine.
- **1: No keyboard:** Local keyboard is locked out when remote user connects
- **2: Blank screen+keyboard**: Local keyboard is locked out and the screen is blacked out, so a local user cannot see the screen when a remote user is connected.
- **3: Local off**: Local access is disabled.

Monitoring Your Configuration

To reduce server downtime, use the **Monitoring** link to have the SLK alert you by email to user-defined error conditions. To receive email alerts, enter your email address, the numeric IP address of the SMTP server used to send the email, and the message format (long or short).

Note: *If you will be receiving email messages on a cellular phone or page, select short messages.*

After you specify this information, you can use the **Error Conditions to Monitor (Host)** area to specify which errors you want to be alerted about and even select the channels that are to be monitored.

Figure 4-21. Monitoring Configuration Page (Alert Action)

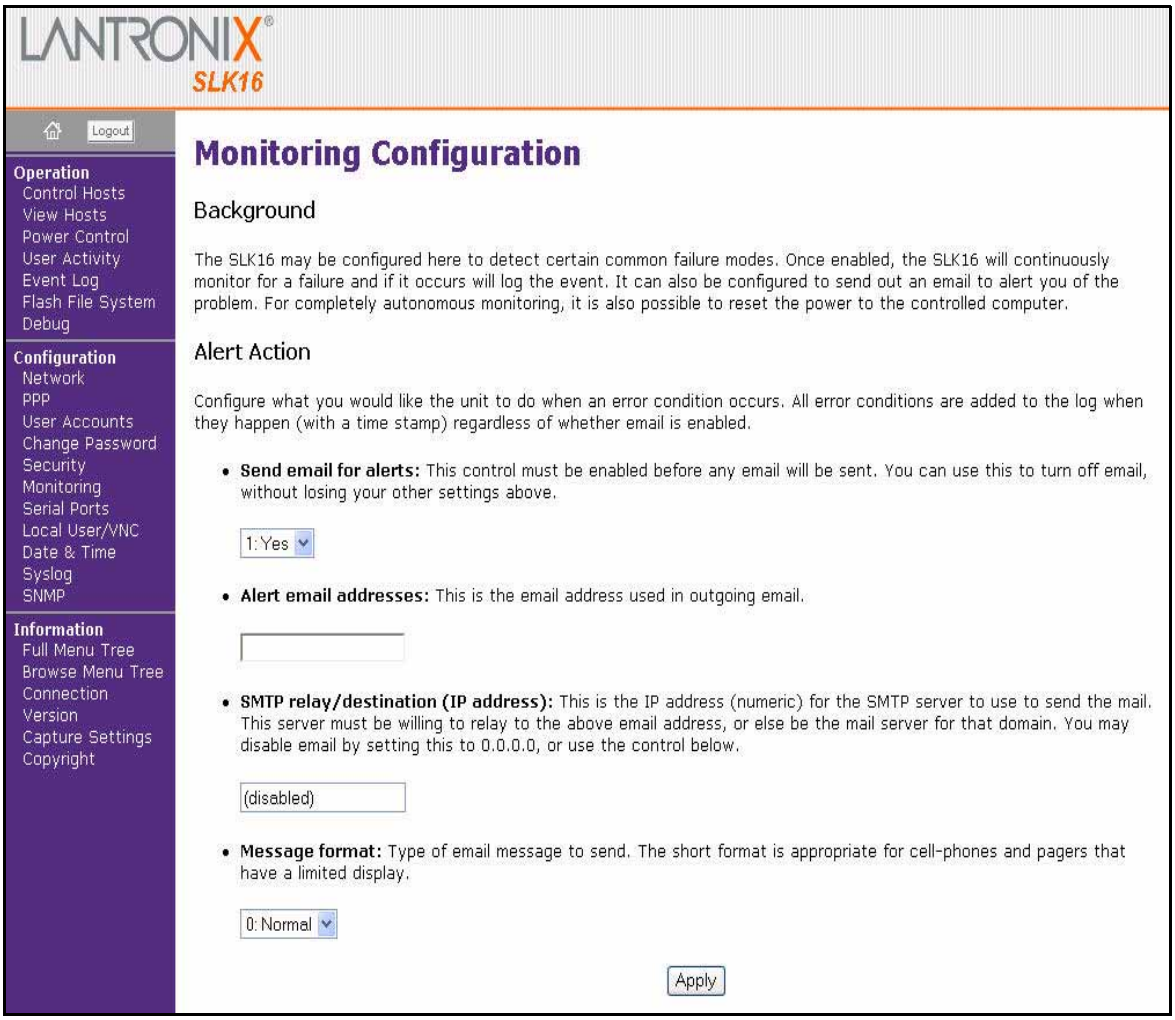
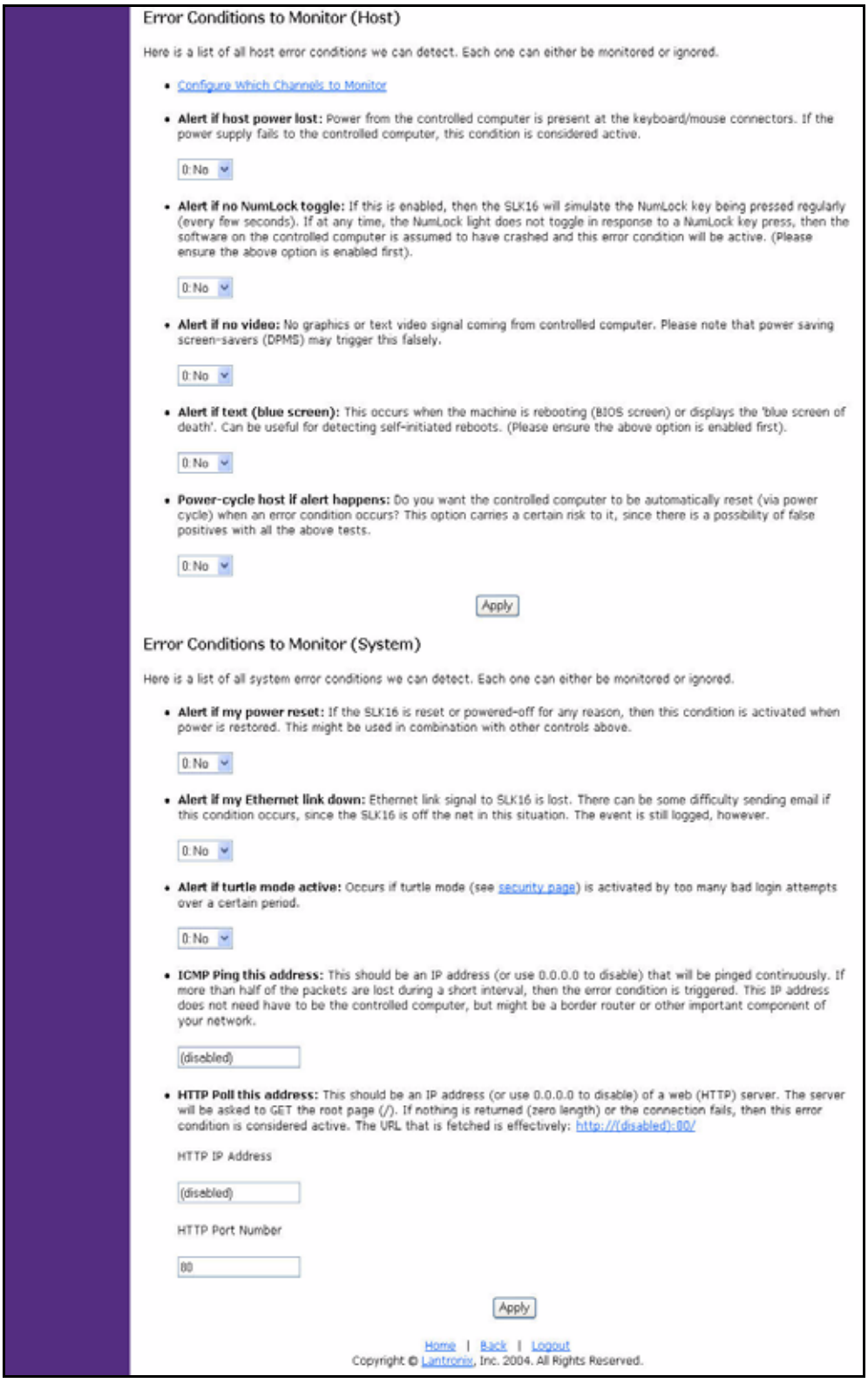


Figure 4-22. Monitoring Configuration Page (Error Conditions to Monitor))



Error Conditions to Monitor (Host)

Here is a list of all host error conditions we can detect. Each one can either be monitored or ignored.

- Configure Which Channels to Monitor
- **Alert if host power lost:** Power from the controlled computer is present at the keyboard/mouse connectors. If the power supply fails to the controlled computer, this condition is considered active.

  0: No
- **Alert if no NumLock toggle:** If this is enabled, then the SLK16 will simulate the NumLock key being pressed regularly (every few seconds). If at any time, the NumLock light does not toggle in response to a NumLock key press, then the software on the controlled computer is assumed to have crashed and this error condition will be active. (Please ensure the above option is enabled first).

  0: No
- **Alert if no video:** No graphics or text video signal coming from controlled computer. Please note that power saving screen-savers (DPMS) may trigger this falsely.

  0: No
- **Alert if text (blue screen):** This occurs when the machine is rebooting (BIOS screen) or displays the 'blue screen of death'. Can be useful for detecting self-initiated reboots. (Please ensure the above option is enabled first).

  0: No
- **Power-cycle host if alert happens:** Do you want the controlled computer to be automatically reset (via power cycle) when an error condition occurs? This option carries a certain risk to it, since there is a possibility of false positives with all the above tests.

  0: No

Apply

Error Conditions to Monitor (System)

Here is a list of all system error conditions we can detect. Each one can either be monitored or ignored.

- **Alert if my power reset:** If the SLK16 is reset or powered-off for any reason, then this condition is activated when power is restored. This might be used in combination with other controls above.

  0: No
- **Alert if my Ethernet link down:** Ethernet link signal to SLK16 is lost. There can be some difficulty sending email if this condition occurs, since the SLK16 is off the net in this situation. The event is still logged, however.

  0: No
- **Alert if turtle mode active:** Occurs if turtle mode (see security page) is activated by too many bad login attempts over a certain period.

  0: No
- **ICMP Ping this address:** This should be an IP address (or use 0.0.0.0 to disable) that will be pinged continuously. If more than half of the packets are lost during a short interval, then the error condition is triggered. This IP address does not need have to be the controlled computer, but might be a border router or other important component of your network.

  (disabled)
- **HTTP Poll this address:** This should be an IP address (or use 0.0.0.0 to disable) of a web (HTTP) server. The server will be asked to GET the root page (/). If nothing is returned (zero length) or the connection fails, then this error condition is considered active. The URL that is fetched is effectively: http://(disabled):80/

  HTTP IP Address

  (disabled)

  HTTP Port Number

  80

Apply

Home | Back | Logout

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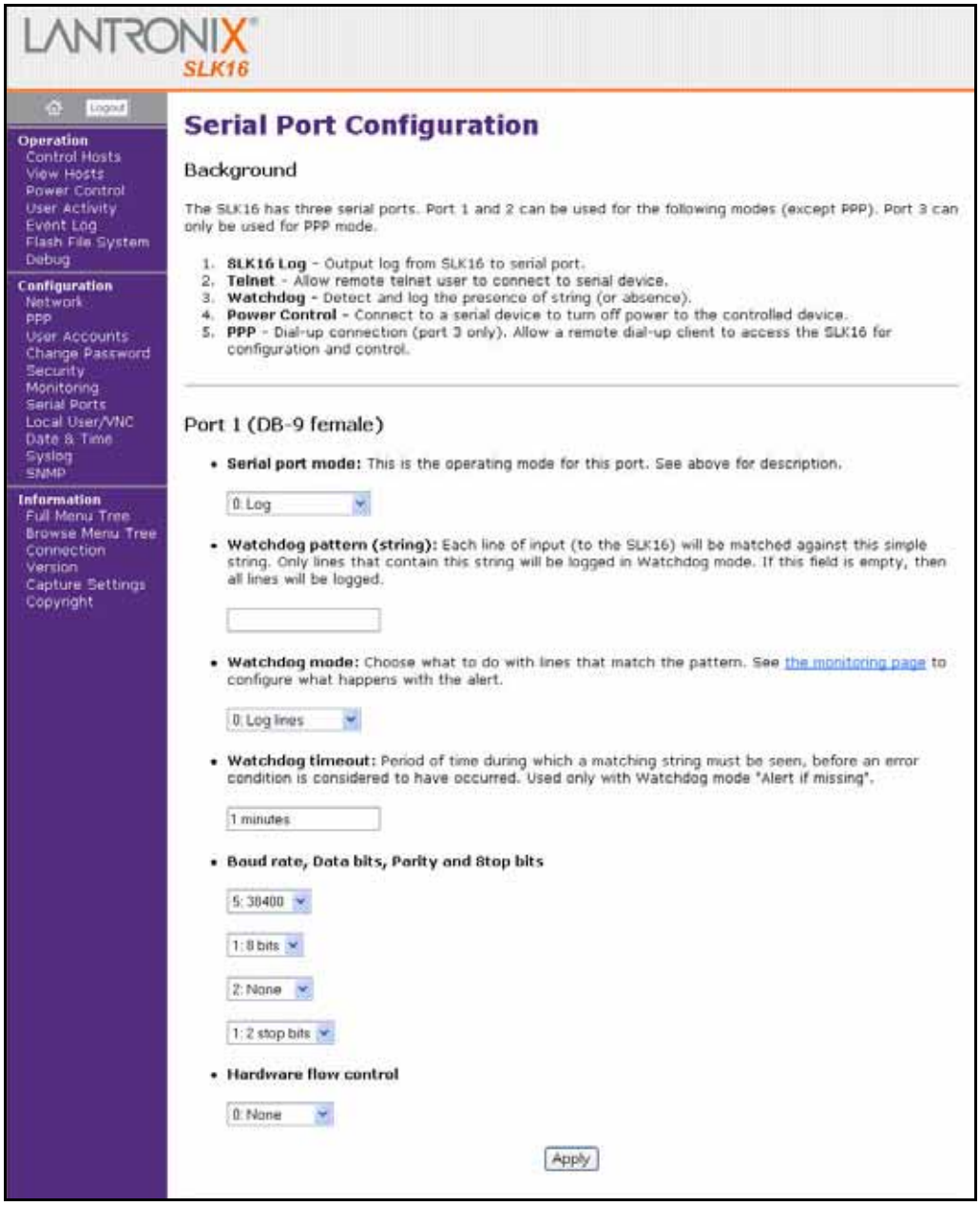
Configuring Serial Ports

The **Serial Ports** link lets you configure the SLK serial ports. Serial ports 1 and 2 provide similar functionality. Serial port 3 on the SLK16 supports modem (PPP) connections (see “Configuring PPP Settings” on page 4-21).

Figure 4-23. Serial Port Configuration Page



Port 1, Port 2, Port 3

These areas let you individually configure the serial ports. (Port 3 only appears for the SLK16.) Selectable parameters are:

- **Mode** — lets you configure the serial port for log, Telnet, watchdog, or an SLP Remote Power Manager (Serial port 3 also supports PPP mode.) Before you choose a mode, specify the port parameters such as Watchdog pattern, mode, time-out, and baud rate.

Note: *If you configure serial port 3 to accept a modem, the SLK persistently searches for the modem. With this configuration, performance will be reduced until a modem is connected and identified by the SLK.*

- **Watchdog pattern (string)** — each line of input to the SLK is matched against this simple string. Only lines that contain this string are logged in Watchdog mode. If this field is empty, all lines are logged.
- **Watchdog mode** — lets you choose what to do with lines that match the pattern. A link is provided for the Monitoring Configuration page, so you can configure the action that occurs with the alert.
- **Watchdog timeout** — the period of time during which a matching string must be seen, before an error condition is considered to have occurred. Used only when Watchdog **mode** is set to **Alert if missing**.
- **Baud rate, Data bits, and Stop bits** — lets you specify these character formats.
- **Flow control** — lets you select Clear To Send/Request To Send (CTS/RTS) or no flow control.

Once you have completed the serial port settings for a port, click **Apply** for that port.

Configuring Local User/VNC Settings

The **Local User/VNC** link lets you configure Virtual Network Computing (VNC) and adjust mouse and keyboard settings for local users. The mouse adjustments do not affect remote operations.

Figure 4-24. Local User/VNC Configuration Page

VNC Server Configuration

The **VNC Server Configuration** area lets you select the following parameters:

- **VNC server port number** — the default port for the first VNC display on a VNC server (normally 5900). To specify a different port number from the VNC client, append it after the host name with a colon (for example, target:123).
- **Max resolution (expected)** — lets you select the resolution for your subsequent VNC sessions. Most users should select the highest resolution from within VNC.

Note: *See* Chapter 6, "Using a VNC Viewer to Access the SLK' *for a description of VNC.*

Local User Setup

The **Local User Setup** area lets you select the mouse threshold and mouse acceleration for local users. These two values determine the speed of the local mouse. When the mouse is moved faster than the threshold value, its movement is accelerated by the acceleration value.

Keyboard Exit Key

The **Keyboard Exit Key** area lets you select the key used to escape normal operation and enter the SLK OSD menu system. On the local port, pressing this key twice quickly starts the menu system that lets you configure the SLK. Over a VNC connection, the same key pressed twice quickly displays a menu of useful functions while online.

Setting the Date and Time

The **Date & Time** page lets you synchronize the SLK (local) time setting to match the remote time on your browser. The SLK reports the remote time rather than the local time zone setting for the controlled servers.

Figure 4-25. Date and Time Page

Background

Provides an overview of the date and time information.

Change time/date

This area provides a **Set date, time and time zone** button. Selecting this button sets the SLK time and zone settings to those of your browser.

Timezone offset (from UTC)

This area lets you specify the number of minutes offset from Universal (UTC) time. Most time zones are on 1-hour boundaries. If you take the UTC time (the time in Greenwich Mean Time) and add this signed value to it, you should get your current local time.

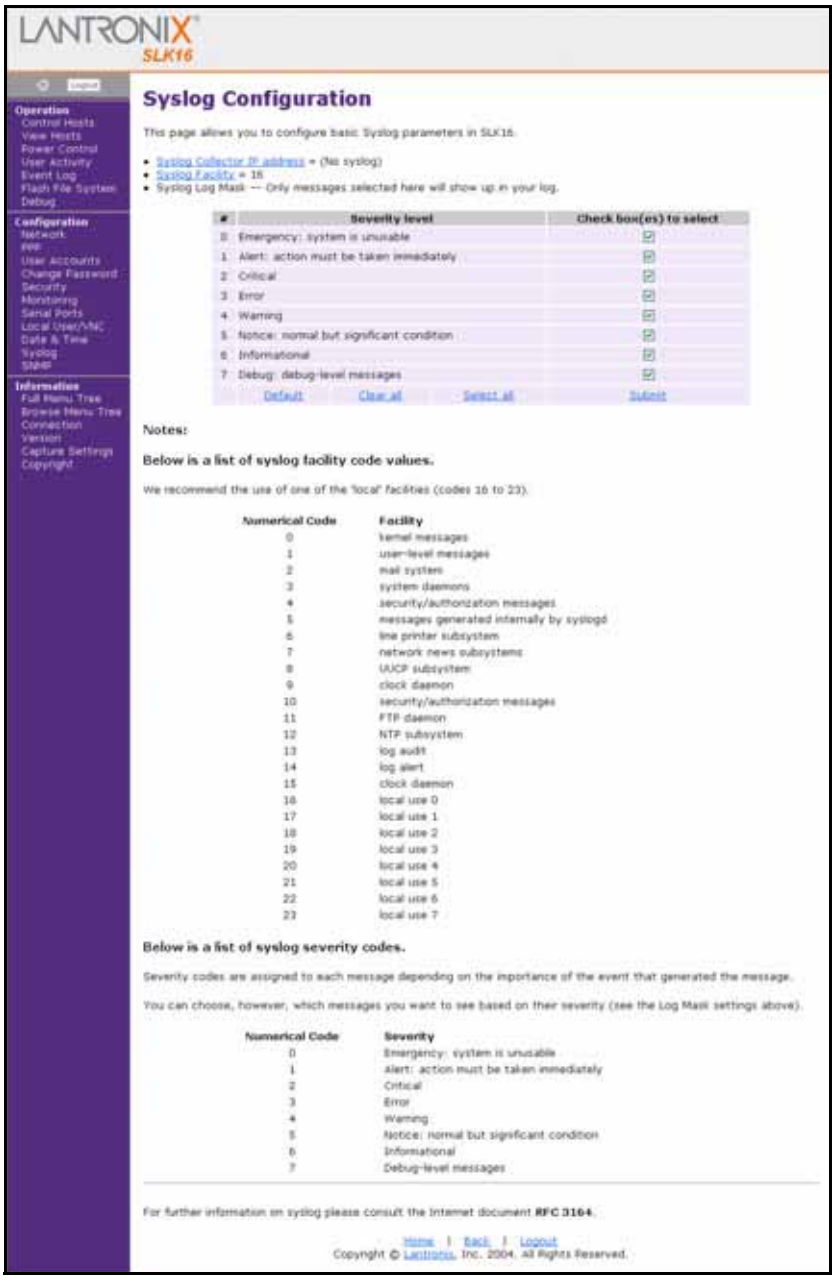
Configuring Syslog Parameters

The **Syslog** link lets you configure system messages to view in the Event Log. This page provides links for changing the Syslog collector IP address and Syslog facility.

This page also provides checkboxes for selecting severity levels that are to be enabled (the severity level that has been enabled/disabled also affects the log messages on the serial port, as it uses the same mask). You can use the **Default**, **Clear all**, and **Select all** links to select or clear these checkboxes. Once you make your selections, click the **Submit** link to apply them.

A list of Syslog facility codes appears at the bottom of the Syslog Configuration page.

Figure 4-26. Syslog Configuration Page

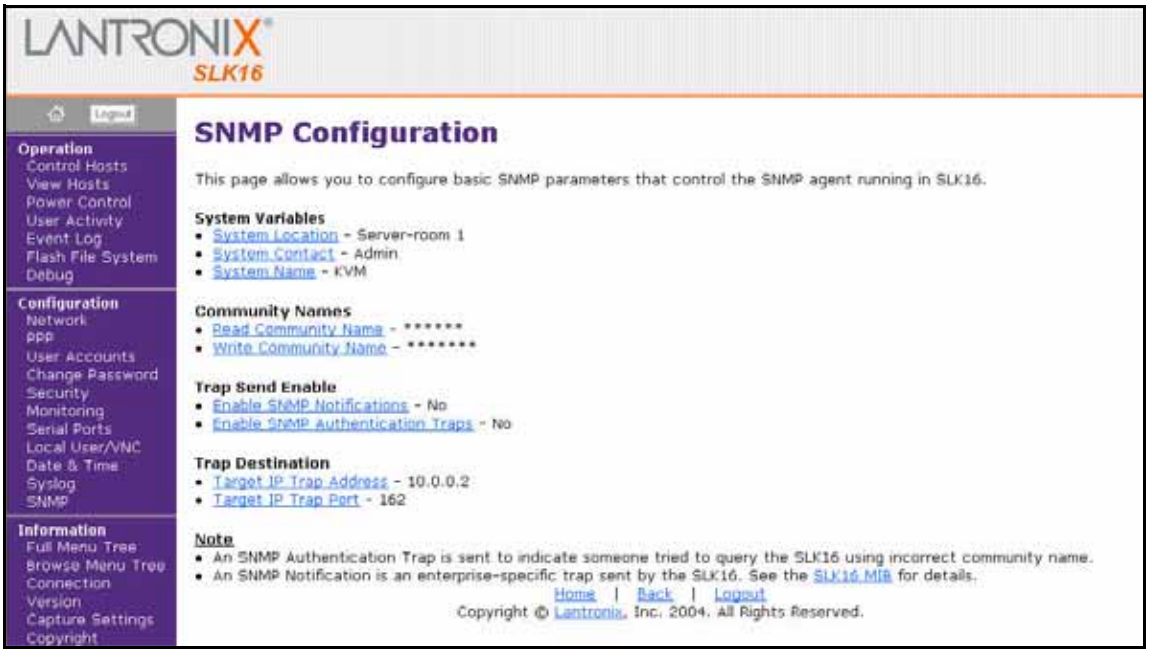


Configuring SNMP

The Simple Network Management Protocol (SNMP) is the most widely used way to gather information about the status of individual nodes on the network and make changes in the operational parameters of the nodes. The **SNMP** link lets you control the SNMP settings for the SLK.

***Note:* If you are not familiar with using SNMP, do not change the settings on this page.**

Figure 4-27. SNMP Configuration Page



System Variables

This area lets you specify the location where the SLK resides, a system contact, and a system name.

Community Names

This area lets you define the read and write community name to be used.

Trap Send Enable

This area lets you enable or disable SNMP notifications and authentication traps.

Trap Destination

This area lets you specify a target IP trap address and a target IP trap port.

Performing Information Activities

SLK information activities can be performed using the links under **Information** in the menu pane of the web control interface. Table 4-5 lists the SLK operation activities.

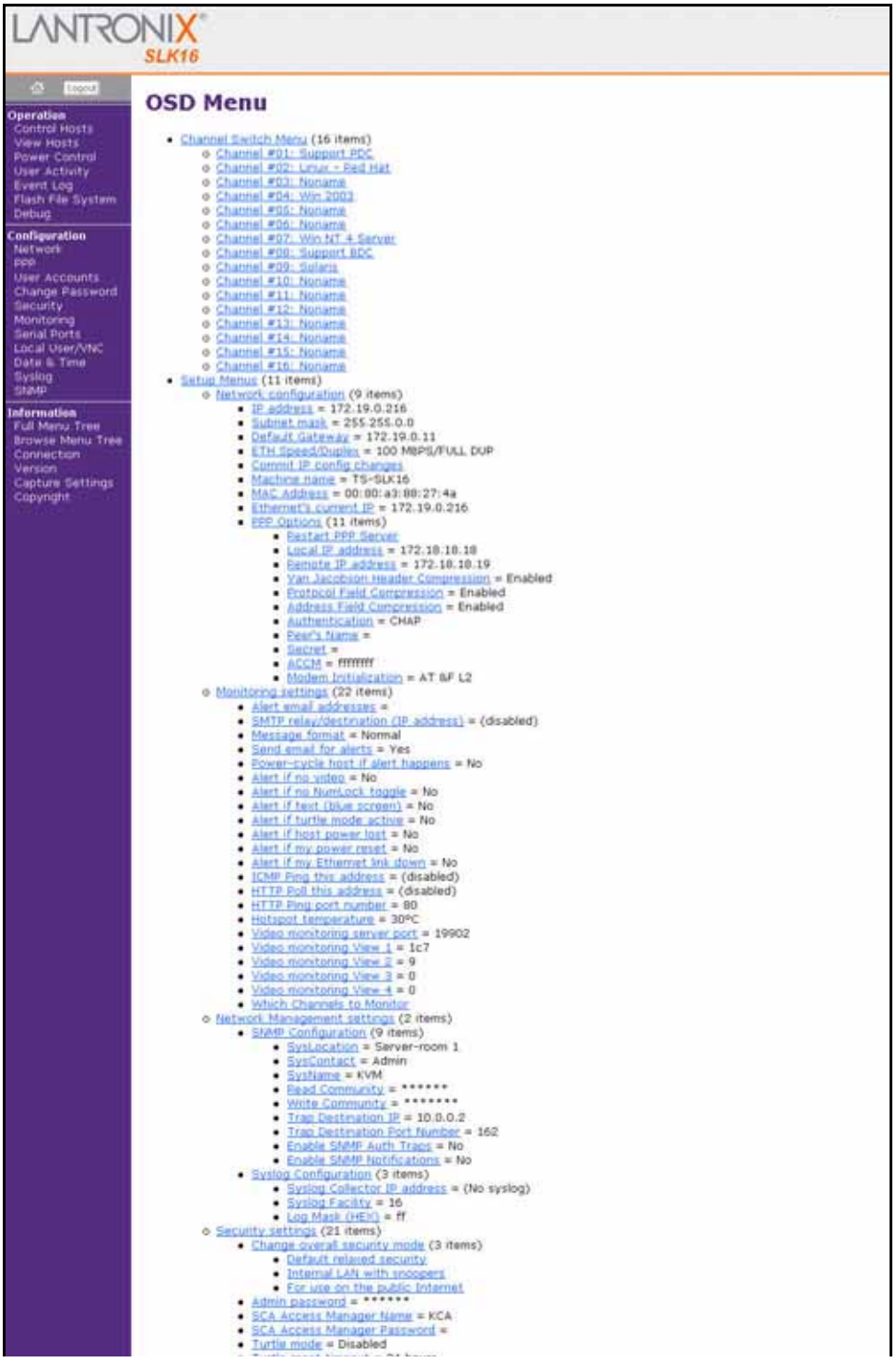
Table 4-5. SLK Information Activities

Menu	Description	See Page
Full Menu Tree	Displays an expanded menu of SLK functions and current settings.	4-45
Browse Menu Tree	Displays a representation of the OSD menu.	4-46
Connection	Displays miscellaneous installation and SSL information.	4-47
Version	Displays serial numbers and versions for your installation.	4-48
Capture Settings	Shows a snapshot of the system log and settings in text format.	4-49
Copyright	Shows the Open SSL encryption copyright requirements.	4-50

Viewing the Full Menu Tree

The **Full Menu** link displays an expanded, interactive tree view of all the operation and configuration functions. This is an alternative access method for configuring SLK functions and provides a visual mapping to the OSD selections.

Figure 4-28. OSD Menu Page



Viewing the Browse Menu Tree

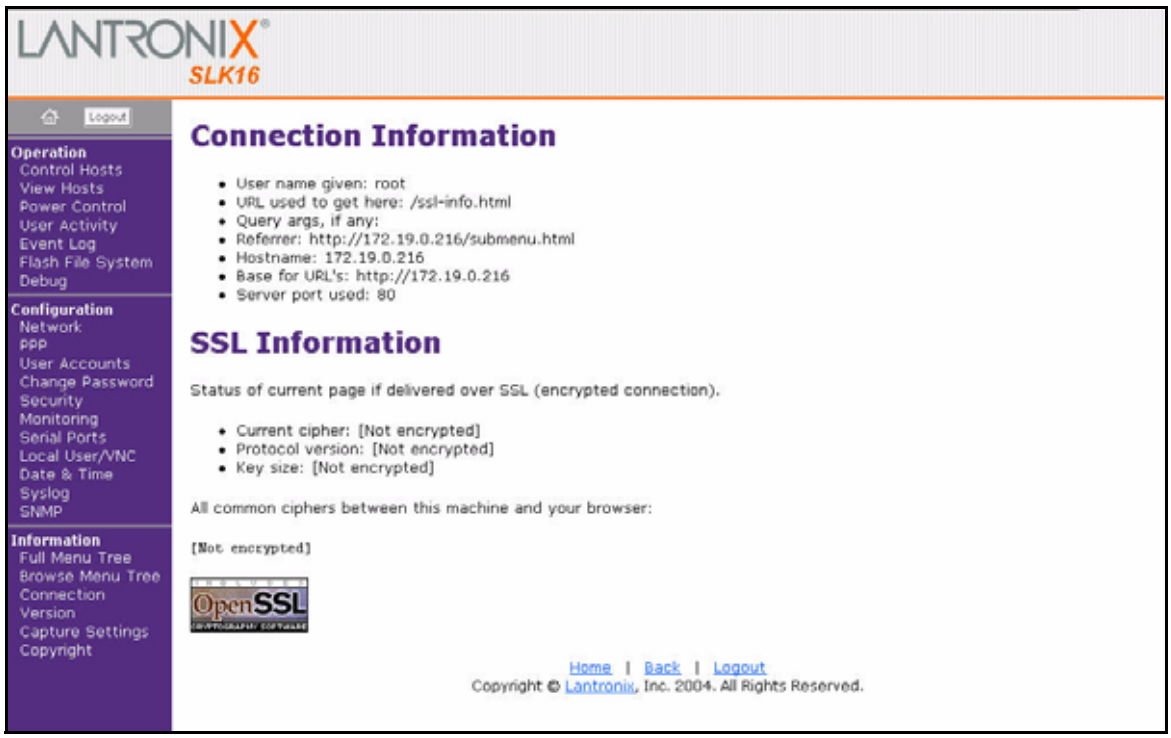
The **Browse Menu Tree** link shows the collapsed structure of the Full Menu Tree. If you click a link, the next page provides a high-level, at-a-glance view of the channel or setup menus. (SLK16 only)

Figure 4-29. OSD Menu Page

Viewing Connections

The **Connection** link displays a page containing connection and SSL information related to the SLK. Figure 4-30 shows an example of this page.

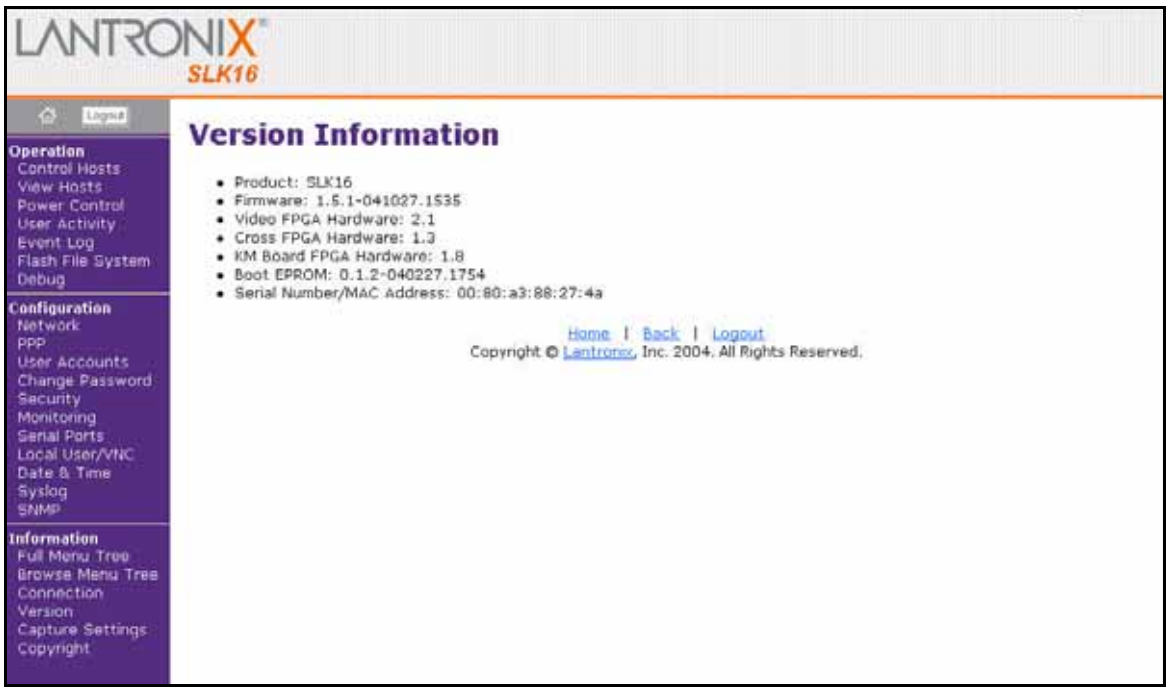
Figure 4-30. Viewing Connection Information



Viewing Version Information

The **Version** link displays a page containing firmware release version information. The network administrator can view (and record) the MAC address from this page without having to remove the device from its installation. Figure 4-31 shows an example of this page.

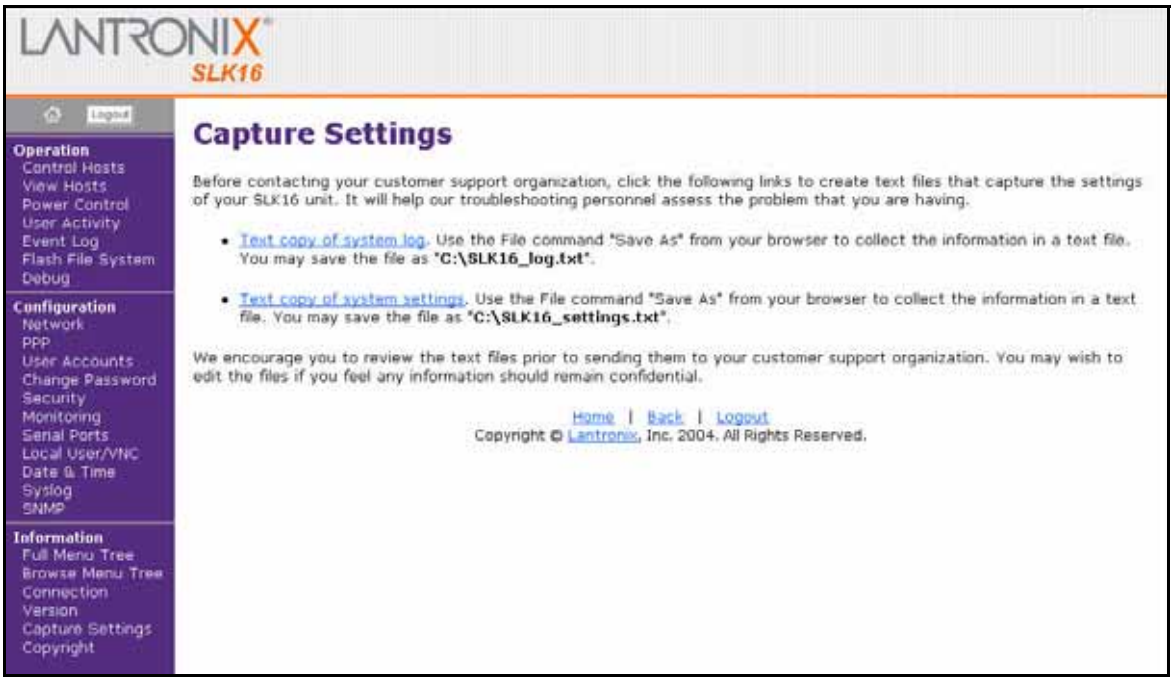
Figure 4-31. Version Information Page



Viewing Capture Settings

The **Capture Settings** link lets you capture text of log entries and system settings to aid in troubleshooting.

Figure 4-32. Capture Settings Page

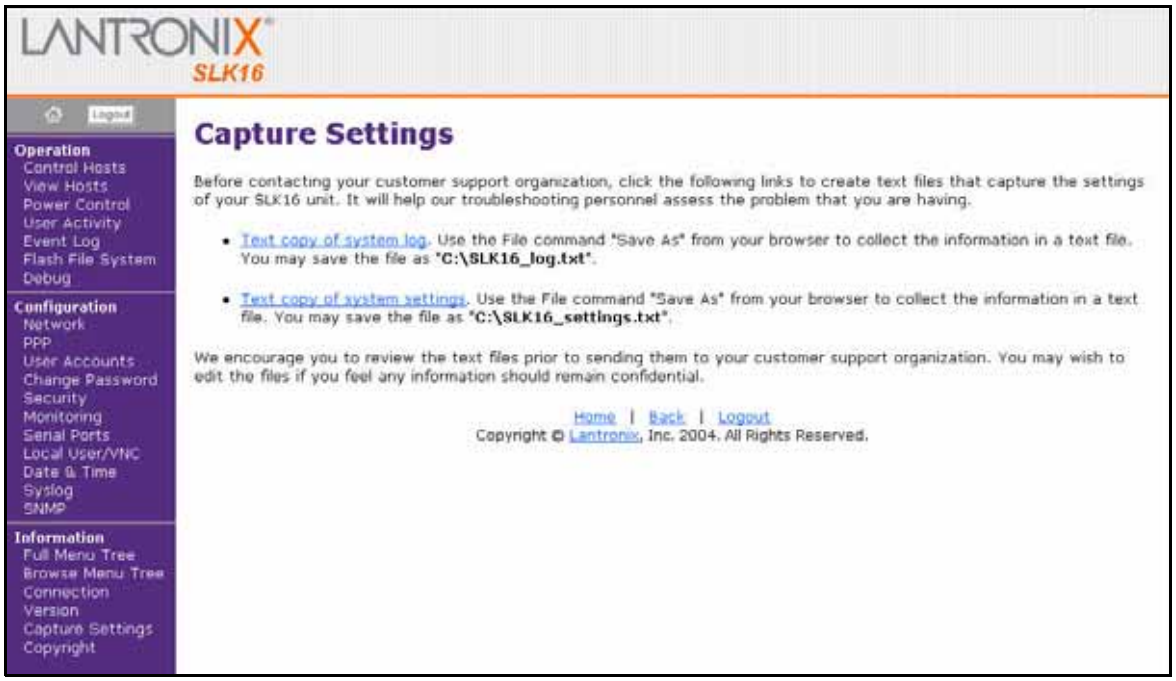


Note: *The saved settings file allows you to view the configuration for reference. It does not provide a format that can be used to upload a saved configuration for re-installation. (See* "Debug (SLC16 only)" on page 4-18 *for this functionary.)*

Viewing Copyright Information

The **Copyright** link displays a page that shows the text that users of Open SSL are required to post on their web sites.

Figure 4-33. Copyright Page



5: Using the OSD Interface to Configure the SLK

This chapter describes how to use the local console's On Screen Display (OSD) interface to configure SecureLinx SLK Remote KVMs. Topics in this chapter include:

Overview

In addition to the web control interface, you can use the local OSD interface to configure the SLK. During the SLK installation procedure, you used the OSD interface to perform the initial network configuration required to set up remote access. Generally, users find the graphical web control interface more intuitive and easier to use than the OSD's text-based interface.

Note: *Alpha-numeric naming restrictions within the OSD are strict. You can enter names that contain upper- and lower-cased a-z and 0-9, as well as period and @ sign. If you use other characters, results may be erratic or confusing.*

Note: *All OSD operations are fully described in the web control interface chapter (see* Chapter 4, "Using the Web Control Interface to Configure the SLK" on page 4-1*). If you are uncertain about an OSD operation, find its explanation in the like-named menu item in the web control interface. For example,* ***local user control*** *in the OSD is duplicated by the Home page menu item called* ***Local User/VNC*** *in the web control interface.*

Logging into the OSD

To log into the OSD, press the 

key twice. The OSD menu in Figure 5-1 displays.

Note: *If the local console is attached to the SLK via a KVM switch that uses* 

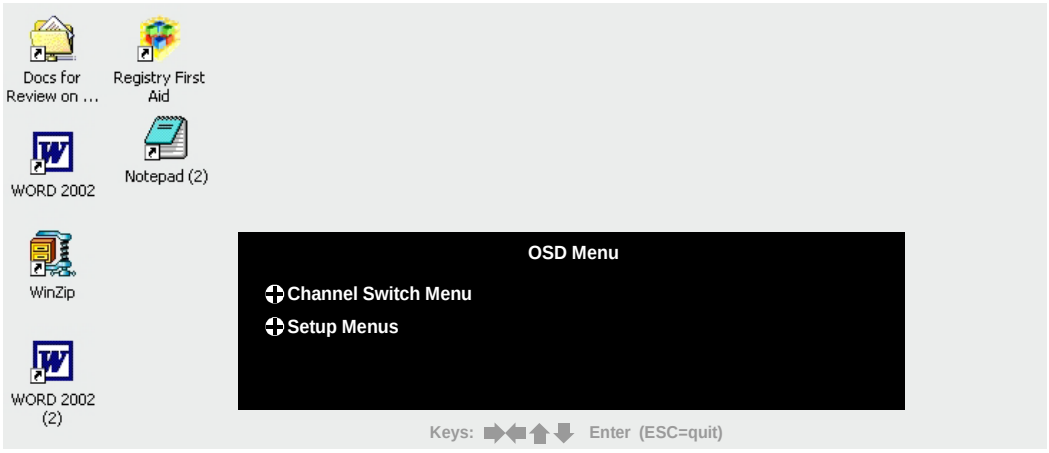
as a display command, you can redefine the local console key combination to invoke the OSD menu by redefining the VNC/OSD hotkey on the Local User/VNC Configuration page in the web interface (see "Configuring Local User/VNC Settings" on page 4-39*).*

For example, pressing 

twice can be defined to invoke OSD instead of pressing 

twice. For a list of available key values, see Chapter 9, "Defining Custom Send Keys" on page 9-1*.*

Figure 5-1. OSD Menu



Navigating through the OSD

The OSD has no mouse support, only simple keyboard navigation commands shown below the black screen. Table 5-1 lists the keys for navigating through the OSD.

Table 5-1. Navigating through the OSD

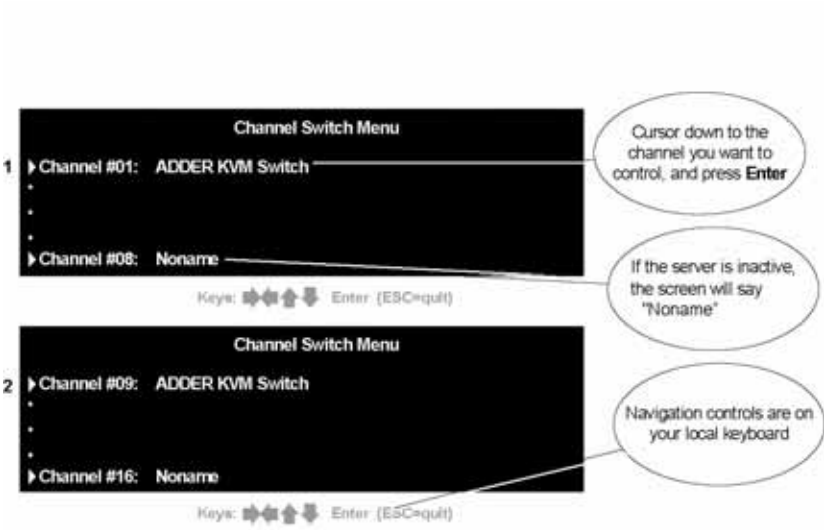
To...	Press...
Navigate through the menu and highlight line items.	**Arrow keys up/down**, or **page up/down** keys
Return to the previous menu branch	**Left arrow**
Expand a menu item that contains a + sign.	**Right arrow** or **Enter**
Change or commit a value.	**Enter**
Quit OSD and return to the desktop	**Esc**

Note: *In the following OSD screens, numbers beside each line refer to the explanations with matching numbers.*

Channel Switch Menu

From the OSD menu (Figure 5-2), highlight the first option to choose channels to control at the local console. To select an active channel, use the directional arrows to highlight that channel and press **Enter**. The SLK then switches the Local Console view to that channel. (The SLK8 and SLK1 do not display this item. They display each available channel as a separate item).

Figure 5-2. Channel Switch Menu



1 Channel #1-8. Use the **down arrow** to navigate to a channel. Press **Enter** to select, view, and control the channel.

2 Channel # 9-16. To view these channels, use the **down arrow** to continue past the channel 8 menu item.

Setup Menu

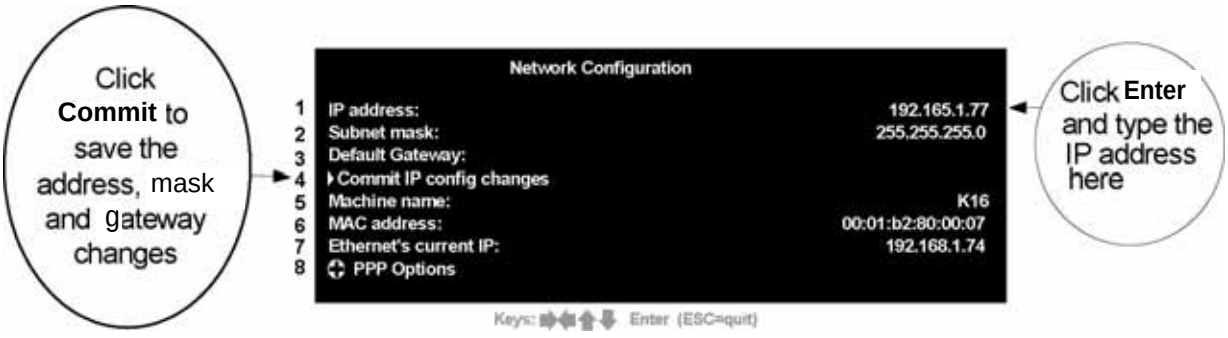
From the OSD menu (Figure 5-1), move the cursor down to the **Setup Menu** and press **Enter.** (For the SLK8, move the cursor up.) The Setup menu opens, with OSD functions arranged in categories (see Figure 5-3). The following sections describe these categories.

Figure 5-3. OSD Setup Menu Screen (1 of 2)

Network Configuration Menu

From the Setup menu in Figure 5-3, ensure that **Network Configuration** is highlighted and press **Enter** to open the menu.

Figure 5-4. Network Configuration Menu



From the Network Configuration menu (Figure 5-4), use the following procedure to configure the network details for the SLK.

1 **IP address**. Highlight **IP address**, press **Enter,** and type the IP address for the SLK you are configuring.

If you prefer to use Dynamic Host Configuration Protocol (DHCP), type the IP address `0.0.0.0` to configure the SLK to request a dynamic address. When

configured for DHCP, the **IP address** field displays **DHCP**, and the **Ethernet's current IP** field displays the acquired address.

2 **Subnet mask**. Highlight **Subnet Mask**, press **Enter,** and type the value for the subnet mask.

3 **Default gateway**. Highlight **Default Gateway**, press **Enter**, and type the IP address for the default gateway.

4 **Commit IP config changes**. When you select **Commit IP config changes**, the SLK attempts to verify the configuration. If it does not identify a conflict on the network, the OSD is refreshed to display the new values.

When you make changes to the **Network Configuration**, you must select **Commit IP Changes** to enable the configuration. Otherwise, the new configuration will take effect after the next reset or power cycle. The OSD screen vanishes after a short pause, so you have to press 

twice to continue with OSD.

Note: *Before you change an existing dedicated IP address,* ***close all remote user sessions****. Otherwise, the running sessions may get locked up and become unavailable to remote users (because they no longer have an IP address to which they can respond). If this happens, perform a warm reset of the SLK from the Debug menu.*

5 **Machine name**. A simple text string that identifies this machine. To change the machine name, enter a new alphanumeric name up to 20 characters long with no special characters.

6 **MAC address**. Displays the hardware address of the Ethernet interface on this SLK. It is assigned by the factory to uniquely identify this SLK and cannot be changed.

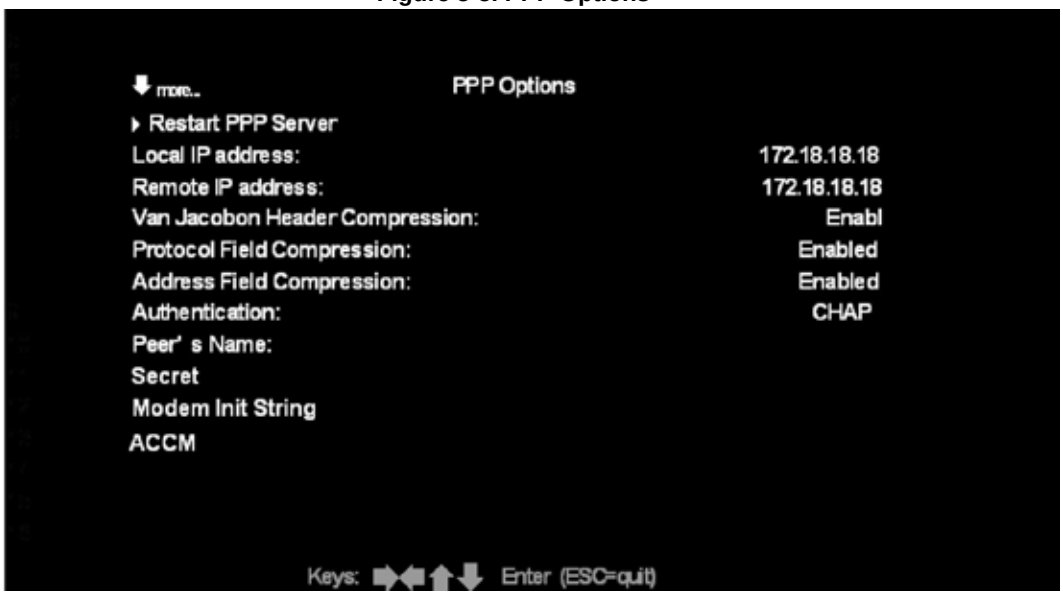
7 **Ethernet's current IP**. Displays the current IP address of the SLK.

8 **PPP options**. SLK16 users can set PPP options by pressing **Enter** to specify a **dialup URL**. You must have serial port 3 set to **Modem** mode and have a modem connected to the serial port. If you set port 3 to **Modem** without connecting a modem, system performance will suffer because the SLK16 will keep looking for a modem attached to serial port 3.

PPP Options (SLC16 only)

Select the lines you need to change in PPP Options and press **Enter** to change as required.

Figure 5-5. PPP Options



9 **Restart PPP server**. Reset the server function in the SLK.

10 **Local IP address**. Address of the SLK for dial-up.

11 **Remote IP address**. Address of the client (remote) PC.

12 **Van Jacobson Header Compression**. Enable if your traffic is mostly small packets that can benefit from reduced header size; otherwise, ignore.

13 **Protocol field compression**. Enable to reduce overhead.

14 **Address field compression**. Enabled by default. Sends compression warning.

15 **Authentication. Login authentication**. Select the level you want to support.

16 **Peer's name**. Enter the peer's user name.

17 **Secret**. Dialup account password paired with peer's name.

18 **Modem Init String**. Initialization string specific to the modem attached to the SLK serial port. For more information, see "Configuring PPP Settings" on page 4-21.

19 **ACCM**. Asynchronous Control Character Maps. Provides a way to negotiate the use of asynchronous control characters. For more information, see "Configuring PPP Settings" on page 4-21.

Monitoring Settings Menu

The Monitor Settings menu spans three OSD screens. Use the **up** and **down arrows** to navigate between them. From these menus you can configure the SLK to continuously monitor the attached servers for common failures. If such a failure occurs, the SLK logs the event and can be configured to alert an administrator via email. Alternatively, for more autonomous monitoring, the SLK can be configured to automatically reset power (power-cycle) to an attached server that reports one of the enabled alerts (this feature requires use of a third-party power control unit).

First Monitoring Settings Screen

Highlight and select **Monitoring Settings** from the **Setup Menus** screen (see Figure 5-3). The first of three available menus displays (Figure 5-6).

Figure 5-6. Monitoring Settings Screen (1 of 3)

Note: *All alert conditions are disabled by default.*

1 **Alert email addresses.** Enter the email address of the administrator who should be notified.

2 **SMTP relay.** Enter the IP address of the SMTP server to use to send mail. This server should be the mail server for the domain or a server willing to relay to the specified email address. To disable, set the address to 0.0.0.0 (default)

3 **Message format.** The email message format can be configured for either normal (default) or short messages.

4 **Send email for alerts.** Enabled by default, but this setting will not take effect until an SMTP server address is configured and enabled.

5 **Power-cycle the host.** The SLK can be configured to use a third-party power control unit to automatically reset a server after a reported failure.

Note: *This choice carries risk because the failure tests may sometimes report a fault erroneously.*

6 **Alert if no video.** Enabling this alert causes a notification if no video signal comes from one of the controlled servers.

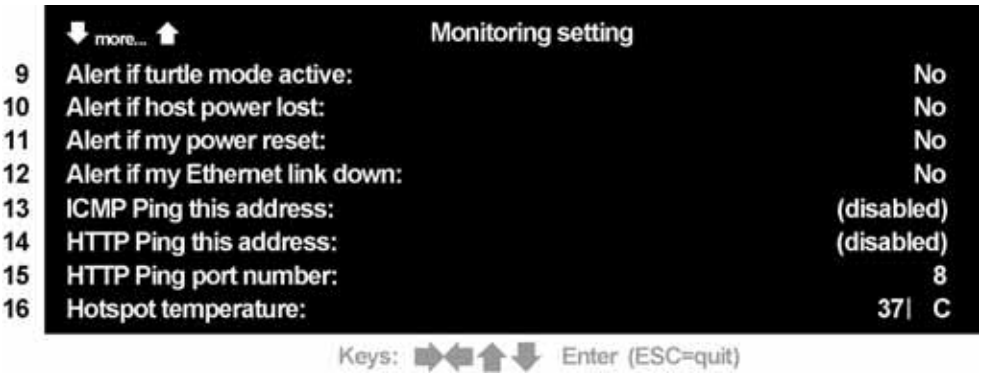
Note: *Active screensavers (DPMS) can trigger this notification erroneously.*

7 **Alert if no NumLock toggle.** If this is enabled, the SLK simulates the key being pressed every few seconds. If the **NumLock** light does not toggle in response to pressing the **NumLock** key, the server is assumed to have crashed and this error condition becomes active. To enable, select **Yes**. To disable, select **No**.

8 **Alert if text (blue screen).** If this server enters text mode, (which can occur if the attached server is rebooting and displaying boot information or is displaying the Windows blue screen). To enable, select **Yes**. To disable, select **No**.

Second Monitoring Settings Screen

Figure 5-7. Monitoring Settings Screen (2 of 3)



9 **Alert if Turtle Mode active.** Turtle Mode is activated if too many bad login attempts occur between successful logins (this setting is dependent upon the security level selected). To enable, select **Yes**. To disable, select **No**.

10 **Alert if host power lost.** This alert is triggered if an attached server loses power. Power loss of the server is determined by power loss on the PS/2 ports. To enable, select **Yes**. To disable, select **No**.

11 **Alert if my power is reset.** If the SLK is reset or powered off for any reason, this alert is activated when power is restored. This alert might be used in combination with other controls. To enable, select **Yes**. To disable, select **No**.

12 **Alert if my Ethernet link down.** If the Ethernet signal to the SLK is lost, this condition is activated. Since the SLK is off the network in this situation, it is only able to send the alert once connectivity has been restored. However, the event is logged for future troubleshooting. To enable, select **Yes**. To disable, select **No**.

13 **ICMP Ping this address.** This address should be an IP address that will be pinged continuously. This error condition is triggered if more than half the

packets are lost during a short interval. This IP address does not need to be that of the controlled server but might be a border router or other "always-on" network component. To enable, enter an IP address to ping. To disable, type `0.0.0.0` (default).

14 **HTTP Ping this address**. The number designated for HTTP pings of addresses/ports should be an IP address of a web (HTTP) server. The server will be asked to get the root page. If nothing is returned (zero length) or the connection fails, this error condition is considered active. To disable, type `0.0.0.0`.

15 **HTTP Ping this port number**. The number designated for HTTP pings of addresses/ports should be an IP address of a web (HTTP) server. The server will be asked to get the root page. If nothing is returned (zero length) or the connection fails, this error condition is considered active. To disable, type `0.0.0.0`.

16 **Hotspot temperature**. Displays the current internal temperature of the SLK.

Third Monitor Settings Screen (SLK16 only)

Note: *SLK8 shows* ***Current Time*** *(monitor menu 2) and* ***Timezone Offset*** *(monitor menu 3).*

Figure 5-8. Monitor Settings Screen – SLK16 Only (3 of 3)

17 **Video monitoring server port**. Allows configuring of the Java port used for video monitoring to a custom port number.

18 **Video monitoring view 1**. First of four arrangements of screens that you can store as hexadecimal values.

19 **Video monitoring view 2**. Second of four arrangements of screens that you can store as hexadecimal values.

20 **Video monitoring view 3**. Third of four arrangements of screens that you can store as hexadecimal values.

21 **Video monitoring view 4**. Last of four arrangements of screens that you can store as hexadecimal values.

Network Management Settings Menu

To configure network logging, use the menus in Network Management Settings (see Figure 5-9). Network Management Settings has two sub-menus, S**NMP Configuration** and **Syslog Configuration**.

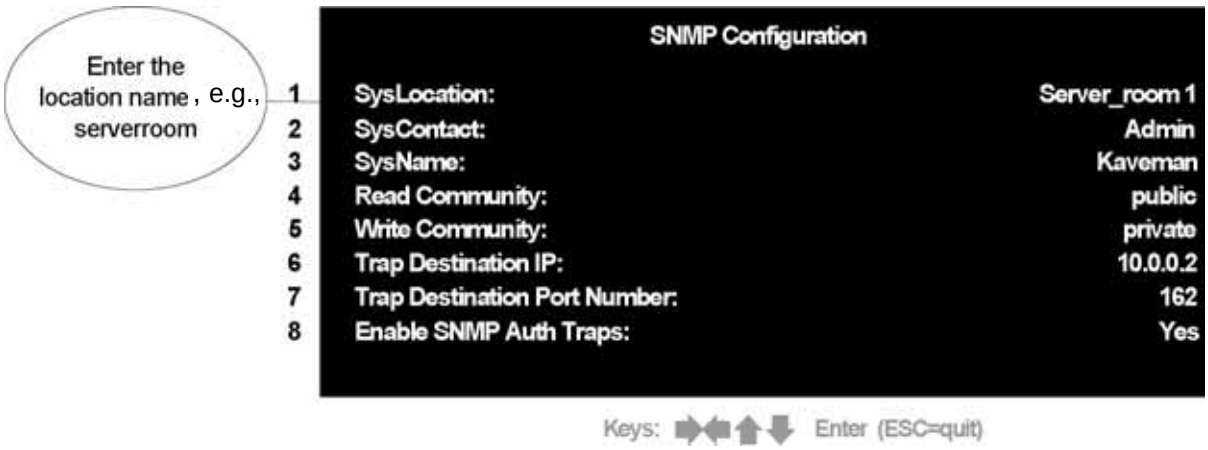
Figure 5-9. Network Management Settings

Note: *The SLK8 and SLK1 display SNMP and Syslog as unique top-level menu selections.*

SNMP Configuration

SNMP Configuration lets you configure Simple Network Management Protocol settings for device communication. Highlight **SNMP Configuration** and press **Enter** to open the SNMP menu (Figure 5-10).

Figure 5-10. SNMP Configuration Menu



1 **SysLocation**. The physical location of the SLK.

2 **SysContact**. User ID of the responsible contact.

3 **SysName**. The name of the SLK.

4 **Read Community**. Community that can read messages. (These display as asterisks on the SLK8).

5 **Write Community**. Community that can write messages. (These display as asterisks on the SLK8).

6 **Trap Destination IP**. IP address of SNMP management station (e.g., HP OpenView).

7 **Trap Destination Port Number**. UDP port number of the SNMP management station (default 162).

8 **Enable SNMP Auth Traps**. Enabling authentication traps generic to SNMP. Enabled is the default.

9 **Enable SNMP Notification** (SLK8 only). Enabled by default.

Syslog Configuration

Syslog Configuration follows the Internet Engineering Task Force standard for handling system events. Highlight **Syslog** to display choices for system logging (Figure 5-11).

Figure 5-11. Syslog Configuration

1 **Syslog Collector IP address**. Type IP address of Syslog collector (daemon). The default is **no syslog**.

2 **Syslog facility**. Numeric designation of message facility (default 16).

3 **Log Mask**. Hex code of severity. Pick any of 8 available codes listed (00–FF). For information about converting binary numbers to hex format, see Chapter B, “Binary to Hexadecimals’. For more details about Syslog configuration, see Figure 4-26.

Security Settings

There are two OSD screens for configuring the SLK security.

Initial Security Screen

The first security screen handles functions like Stealth and Turtle as well as general policy.

- **Change overall security** mode. Press the **right arrow** key to select between **relaxed**, **snooper**, or **public options**. (See Figure 4-19.)
- **Admin password**. The password for the master account (for which the user ID can be only **root** or **administrator**).
- **Turtle mode**. Select to disable (default) or set sensitivity to authentication failure.
- **Turtle reset timeout**. Type the number of hours that the SLK locks out remote access after Turtle mode has been triggered. Local reset is allowed.
- **Reset Turtle protection now**. Manual reset is allowed only at local console.
- **Stealth mode**. Select **Enabled** to conceal your presence on the net. Ignores pings.
- **Require encryption**. The default is **Optional.** When set to **Mandatory** (on SLK1 and SLK8, this option is **Required**), all Web requests are rerouted to HTTPS ports.

  The SLK provides SSL encryption. For this feature to work, install in the SLK a valid server certificate and key provided by a trusted source. The certificate and key must be in PEM format and the name of the files should be `server-cert.crt` and `server-cert.key`. To install the certificate and key, access the flash file system through the web control interface and upload the certificate and key through the browser (see “Using Security and Encryption” on page 8-3). Perform a hard reset to have the SLK load the new certificate and key and delete any old ones in the system. If you use a browser, you must have the **Sun Java Plug-in 1.4.0** or higher installed. SSL setup is not available through VNC.

Note: *Be sure an appropriate certificate/key is installed and functional before changing the mode. If the certificate/key is not installed, not loaded, or wrong, mandating HTTPS locks out the SLK to any remote access. For installation information, see* Chapter 8*.*

- **HTTP port number**. You may specify a number other than the HTTP default port number of 80. (**HTTP port number** is on the second screen in the SLK8.)

Second Security Screen

The second security screen offers the user additional security by allowing changes to default port numbers, as well as forcing logout of idle terminals.

- **HTTPS port number**. You may specify a value other than the HTTPS default port number of 443.

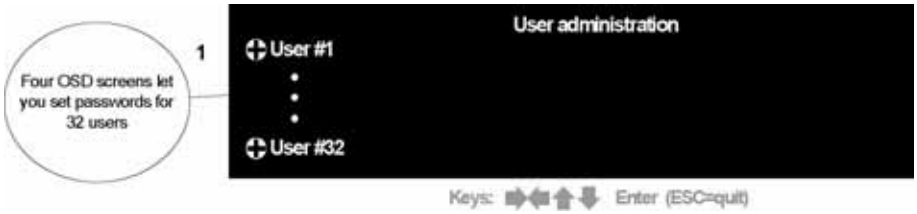
- **Reset web server**. Select and press **Enter** to reset Web server to implement new Web server settings.
- **Idle logout**. This logs out sessions that are no longer in use and makes these resources available for a new remote connection. The default is 30 minutes. Enter the number of minutes to change idle logout time.
- **Telnet server port**. Enter the new Telnet port number that you want to use. Type **0** to disable.
- **JavaViewer port number (clear)**. “Clear” means unencrypted. The default value is 19900. To change, enter the new JavaViewer port number that you want to use.
- **JavaViewer port number (SSL)**. The default value is 19901. To change from default, enter the new JavaView port number that you want to use.
- **Viewer encryption policy** (SLK16 only). **KM1** only encrypts keyboard and mouse data. **KVM** encrypts keyboard, video, and mouse data streams with reduced performance.
- **Channel locking policy (JView)** (SLK16 only). The default setting, **Manual**, initiates channel access without locking. **Automatic** locks down the channel being accessed during initiation of the remote session.

User Administration

If you have the authority to access this screen, you can configure new users and assign their passwords and system privileges. The total number of user accounts you can specify depends on the SLK model you have:

- SLK1 and SLK8: You can specify 10 user accounts.
- SLK16: You can specify 32 user accounts.

Figure 5-12. User Administration



1 **User #**: Highlight the user number for the person whose name and password you want to configure. This opens that user account for editing.

User Name Fields

Figure 5-13. User Name Fields

1 **User 1 Name**: Enter a user name or a user ID for the first user. The name can contain up to 19 contiguous alphanumeric characters. Including non-alphanumeric characters or spaces results in an unusable account.

2 **Password**: Enter the password for the account. Confirm the password when prompted.

3 **Account type**: Accounts can be disabled or enabled.

4 **Channel Privileges**: Select authorized actions for the channel. For more information, see step 6 on 4-27.

Note: *You can create user accounts using the OSD, but you must define server access using the web control interface.*

Serial Port Configuration

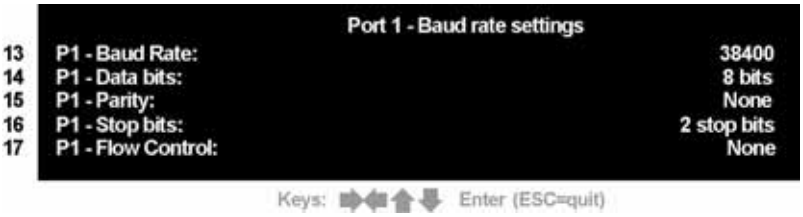
Using the serial port screens, you can configure the SLK serial ports. For the SLK16, you can also configure serial port 3 for a dial-up response.

For each available setting, select the menu item and press **Enter** to advance through the options.

Figure 5-14. Serial Port Configuration (Screen 1 of 2)

1 **Port 1 - Baud rate settings.** The default is 38400/8/N/2/N (see Figure 5-15). Select and press **Enter** to open the option list.

Figure 5-15. Serial Port 1 — Baud Rate Settings



P1 Baud Rate. Choose a baud rate, in bits per second (bps), for serial port 1.

P1 Data bits. Choose 7 or 8 bits.

P1 Parity. Choose **Odd**, **Even**, **None**, **Mark**, or **Space**.

P1 Stop bits. Choose **1** or **2**.

P1 Flow Control. Choose **None** or **CTS/RTS**.

2 **Serial port mode.** Select and press **Enter** to advance through the available modes for serial port 1. You may select from Log, Telnet, Watchdog, and Power Control. For details see “Configuring Serial Ports” on page 4-37.

3 **Watchdog mode.** Select and press **Enter** to advance through the available watchdog modes for serial port 1. You may select from Log lines, Alert if found, and Alert if missing. For details see “Configuring Serial Ports” on page 4-37.

4 **Watchdog pattern.** Select to enter the watchdog pattern. Each channel is matched against this simple string.

5 **Watchdog timeout.** Select and press **Enter** to edit. Enter timeout values in minutes.

6 **Port 2 - Baud rate settings**. The default is 38400/8/N/2/N (Figure 5-16). Select and press **Enter** to open the option list. Select Port 2 settings (Baud Rate, Data bits, Parity, Stop bits, Flow Control) in the same way as for port 1.

Figure 5-16. Serial Port 2 — Baud Rate Settings

7 **Serial port mode.** Select and press **Enter** to advance through the available modes for serial port 2. You may select from Log, Telnet, Watchdog, and Power Control. For details see “Configuring Serial Ports” on page 4-37.

8 **Watchdog mode.** Select and press **Enter** to advance through the available watchdog modes for serial port 2. You may select from Log lines, Alert if found, and Alert if missing. For details see “Configuring Serial Ports” on page 4-37.

Figure 5-17. Serial Port Configuration (Screen 2 of 2)

9 **Watchdog pattern.** Select to enter the watchdog pattern. Each channel is matched against this simple string.

10 **Watchdog timeout.** Select this menu item and press **Enter** to edit. Enter timeout values in minutes.

11 **Port 3- Baud rate settings**. The default is 38400/8/N/2/N (see Figure 5-18). Select and press **Enter** to open the option list.

Figure 5-18. Serial Port 3— Baud Rate Settings

Port 3 settings (Baud rate, data bits, parity, stop bits, and flow control) are selected the same way as for port 1.

12 **P3 serial port 3 mode**. PPP (dial-up through modem). Select and press **Enter** to select other modes on port 3. This option is valid for the SLK16 only.

Local User Control

This screen allows administrators to configure local usage of the targeted server.

Figure 5-19. Local User Control Screen (1 of 2)

1 **Reset local keyboard and mouse**. Resets these devices connected to the SLK local port. This is a good way to remove control-key locks and other undesirable states from the keyboard. You can also try resetting the mouse locally by unplugging and replugging the mouse cable.

2 **Resync mouse position**. Resynchronizes the mouse of the remote client and that of the server by forcing the server mouse to the top-left corner for renewed tracking.

3 **Mouse threshold**. Determines the starting threshold (mouse speed) for mouse acceleration. These are SLK-specific modifiers to counter disabled acceleration on target servers and rarely need to be modified.

4 **Mouse acceleration**. The factor by which to modify the mouse speed. See comments above for **Mouse threshold**.

5 **Local console**. The available options are No password, Require Password, and Disable access.

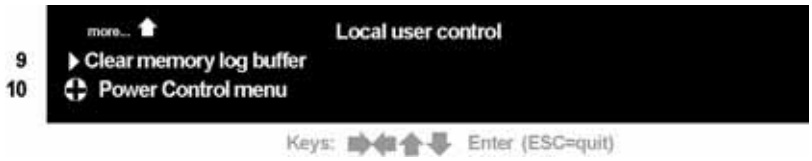
Note: ***Disable access renders the SLK inaccessible if remote access fails.***

6 **Local User exclude**. Options are to share access with remote, have no keyboard for the local user, or have a blank screen + keyboard (no local access except for mouse).

7 **Current time (approx)**. Displays current time and date set on the SLK. Changes can only be applied through the web control interface. (This setting is on the Monitor Settings menu on the SLK8 and SLK 1.)

8 **Time zone offset (from UTC)**. Sets the time offset, in minutes, from Greenwich Mean Time (GMT). A minus sign indicates you are east of the Greenwich Observatory. (This setting is on the Monitor Settings menu on the SLK8 and SLK 1.)

Figure 5-20. Local User Control Screen (2 of 2)



9 **Clear memory log buffer**. Clears the event log in memory.

10 **Power Control menu**. Opens the Power Control menu when you want to change the state of a port on an optional third-party power control unit.

Note: *This requires configuring a serial port for power control.*

11 **Rotate: Delay after last K/M** (SLK16 only). Idle time (keyboard and mouse) in seconds before rotation starts. Default = **0** (disabled).

12 **Rotate: Time showing channel** (SLK16 only). Duration, in seconds, that each channel is displayed. Default = **0** (disabled).

13 **Reset the power to outlet *n***. Turns the power state **off** and then back **on** for outlets 1 through 16, regardless of the current power state (same as Cycle Power).

14 **Turn off power to outlet *n***. Turns the power state **off** for the selected outlet (1-16). Requires use of third-party power control.

15 **Turn on power to outlet *n***. Turns the power state **on** for the selected outlet (1-16). Requires use of third -party power control.

Virtual Network Computing

If you can access the web control interface but cannot use the Java Viewer to remotely control the attached servers, you can choose Virtual Network Computing (VNC). This OSD screen allows configuration of the VNC server port number, bandwidth goal, and display resolution. It also displays the current OSD/VNC hotkey setting (this value must be changed through the web control interface).

- **VNC server port number**: Specify a server port number or leave the default.
- **Bandwidth goal**, **network bandwidth**, and **resolution** can be set or optimized for those who use VNC frequently. Others may choose to keep the defaults.

Channel Configuration

This screen allows administrators to alter generic names (for example, Channel 1) to custom names that more accurately identify the attached server. Options include:

- Channel Name
- Emergency Contact Name
- Emergency Contact Number
- Operating System
- Mouse Acceleration Type (choose None, Microsoft Win, Sun Solaris)

Note: *Operating systems use different mouse acceleration algorithms. Proper identification of the attached operating system allows the SLK to adjust mouse synchronization accordingly.*

Power Outlet Administration

This screen allows administrators to alter generic names (for example, Outlet 1) on an attached power control unit to custom names that more accurately identify the attached server. Options include:

- Synchronize Outlet Names to Channel Names

Debug – (Factory Only)

This screen provides OSD map and maintenance options (including a warm reset feature). **Do not change settings in this submenu unless authorized by Lantronix Technical Support.**

6: Using a VNC Viewer to Access the SLK

This chapter describes how to use a Virtual Network Computing (VNC) viewer to access target servers attached to SecureLinx SLK Remote KVMs. Topics in this chapter include:

Overview

You can use a VNC viewer to access target servers. To download a free VNC viewer, visit http://www.realvnc.com/download.html or search the Web for the keywords “vnc“ and “research vnc”. The VNC site also offers examples and instructions, which are not repeated here.

Note that:

- VNC is a thin client (consumes only 228 K) and is command-line oriented.
- VNC can be configured locally in the SLK.
- VNC supports most basic features of the SLK.
- VNC cannot access the web control interface.

Note: *VNC does not support encryption natively. However, it can be streamed over Virtual Private Network (VPN) or Secure Socket Handling (SSH) tunnels.*

Using a VNC Viewer to Access Target Servers

After you install the VNC viewer on your remote PC, follow these steps to remotely access and control the target server through the SLK**.**

1 At the local console, access the On Screen Display (OSD) Setup menu.

2 Select the **VNC** menu (see Figure 6-1 on page 6-2).

3 Enter the VNC server port number. You can also optimize the bandwidth and resolution, or leave them at the default values.

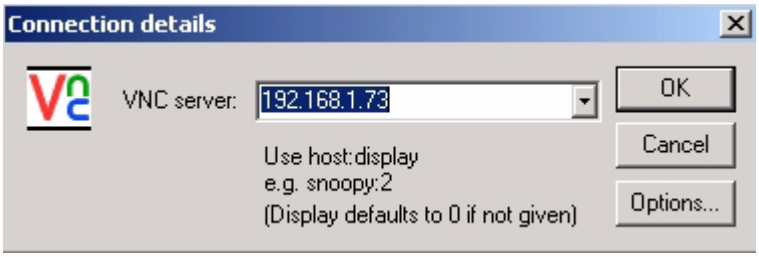
Figure 6-1. Local Console VNC Configuration Screen

4 At your remote PC, click the **VNC.exe** file to open the VNC Viewer.

5 Enter the SLK's IP address in the Connection details dialog box (see Figure 6-2). Then type a colon and the VNC port number.

Note: *If no port number is specified (as shown in Figure 6-2), the default port 5900 is assumed and used.*

Figure 6-2. Connection Details

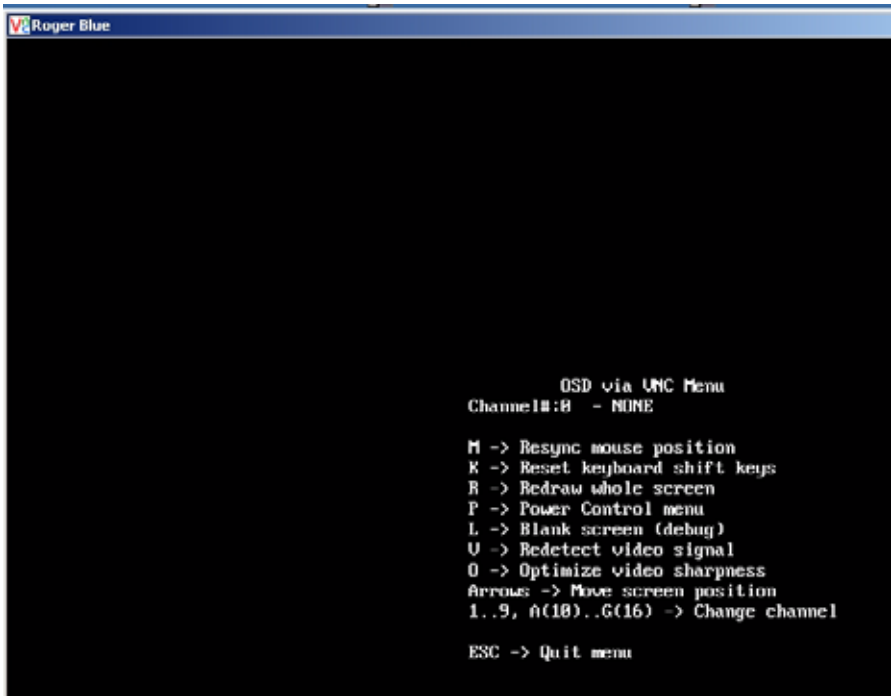


6 Click **OK**.

7 Enter the SLK password in the VNC Authentication dialog box. (This is the same password you use to access the web control interface.) After a few seconds, the VNC menu appears (see Figure 6-3).

Note: *SLK1 and SLK8 automatically show channel 1 and the last remote channel accessed, respectively.*

Figure 6-3. OSD/VNC Menu with Corner Icon



8 Although the menu contains the word **OSD** and looks like the SLK's local OSD, it is only for remote access to the SLK.

9 To navigate between channels in the OSD via VNC menu, enter a value from 1-9 or A to G to select one of the 16 possible channels. The selected channel displays in the VNC window. You can also control that channel using VNC commands.

Table 6-2. Values for Selecting Channels

Channel	Value	Channel	Value
Channel 1	**1**	Channel 9	**9**
Channel 2	**2**	Channel 10	**A**
Channel 3	**3**	Channel 11	**B**
Channel 4	**4**	Channel 12	**C**
Channel 5	**5**	Channel 13	**D**
Channel 6	**6**	Channel 14	**E**
Channel 7	**7**	Channel 15	**F**
Channel 8	**8**	Channel 16	**G**

7: Troubleshooting

This chapter provides troubleshooting suggestions you can follow in the unlikely event that you encounter a problem using SecureLinx SLK Remote KVMs. In addition to this chapter, you can find answers to frequently asked questions at www.lantronix.com/support.

Topics in this chapter include:

General Troubleshooting

Problem	Suggestion
You forgot your password.	Please contact Lantronix Technical Support.
You cannot log into the SLK Web page or ping its IP address.	There is a problem with the assigned IP address. From the Local Console OSD: 1. Go to **Network Settings**. 2. Verify the IP address. 3. Re-enter the IP address if necessary and recommit the change. 4. Confirm the validity of the IP addresses with your IT department. 5. Verify that the default HTTP port number is 80; otherwise you must include the port number in the URL. 6. When troubleshooting, disable stealth mode (otherwise there will be no ping response).
When you use VNC, it only shows a portion of the remote screen. If the video resolution on the attached server is higher than that of the VNC viewer, you will not be able to see the entire remote screen.	If you are looking at servers with different resolutions, when you switch to a higher resolution server via a KVM switch, you will not be able to see the entire remote. There are two solutions to fix this problem: 1. Change VNC server configuration - Max resolution (expected) from **Auto** to **Max** (permanent, but uses more bandwidth). 2. Reload VNC when changing to higher resolution image (not permanent).
The VNC does not work under Linux or FreeBSD.	Use “vncviewer -bgr233” to initiate the VNC viewer with the proper flag to get it to work with your SLK unit.
You want to reduce the steady-state network traffic generated by VNC.	1. Improve video quality first. Any video noise is sent over the network, so you can reduce the resolution or refresh rate to reduce the noise. 2, Reduce the resolution to 1024x768 or lower.

Problem	Suggestion
You want to reduce the overall network traffic generated by VNC.	1. Use a flat-color desktop background, rather than a personal picture (e.g., your family). This data must be sent every time the window is moved, so it is best if it is a single color that requires little compression. 2. Improve video quality, so no analog noise is sent.
You tried to upload firmware, but received a message that the file was not found.	Some versions of Internet Explorer cannot upload the firmware image (or any other file) if part of the file path contains a space. This is a problem, for example, if the file Image.frm is stored as `C:\My Document\Image.frm`. The solution is to use Netscape, or move the file to be uploaded into another directory that does not contain spaces in its file path.

Keyboard Troubleshooting

Problem	Suggestion
There is no keyboard signal.	Disconnect and reconnect keyboard cable between the server and the SLK, or reset the server. If you are using extended length cables, try using shorter ones.
The local keyboard does not respond or the keyboard mapping is wrong.	Locally re-seat the keyboard. Make sure the SLK responds when you press the hotkey (**Scroll Lock**) to access the local OSD. If yes, reset the keyboard and mouse using **OSD->Local Settings**. If no, try a different keyboard.
The remote keyboard does not respond or the keyboard mapping is wrong.	Remotely reset the keyboard through the web control interface or the VNC menu.
The hotkey combination for web control interface or VNC viewer does not work.	Reset the keyboard or change the hotkey. 1. Remotely reset the keyboard and mouse either through web control interface or VNC menu. 2. Change the hotkey combination in the SLK web control interface. You can access the hotkey combination under the Local/VNC configuration menu below the Keyboard Exit Key area (see “Keyboard Exit Key” on page 4-40).

Mouse Troubleshooting

Note: *This guide refers to the mouse indicator on the attached server as the "local" mouse. We refer to the mouse on the PC accessing the KVM remotely as the "remote" mouse. (In the browser interface, the remote mouse usually displays as a crosshair icon. In the VNC interface, the remote mouse usually displays as a small black square.*

Problem	Suggestion
There is no mouse signal.	Disconnect and reconnect mouse cable between the server and the SLK, or reset the server. If using extended length cables, try using shorter ones.
The remote and local mice work poorly or are out of synchronization.	Reset the mouse synchronization or shift the screen. 1. Using the web control interface, click the **Resync Mouse** button to resynchronize the mouse. 2. Verify that acceleration has been disabled on the server according to Figure 3-7 on page 3-12. The mouse may be sluggish due to video noise. See "Video Troubleshooting" on page 7-8.
The mouse is always in the wrong position by a small, fixed amount. This persists even after a "mouse resync" operation.	There is a screen position error, so the SLK's idea of the mouse position is offset by the width of the black bars/or missing area. Realign the screen from either the web control interface or VNC viewer: ❖ From the web control interface, toggle the Shift Screen to "On". Use the **arrow** keys to change the position of the screen until the mouse is aligned. ❖ From the VNC viewer, use the phase shift command.
The remote (console) mouse does not respond.	Locally re-seat the mouse. Reset the keyboard and mouse using **OSD--> Local Settings**. Try a different mouse.

Problem	Suggestion
The local mouse (on the attached server) does not move.	Perform the following steps: 1. Disconnect and reconnect connections. 2. Select “Reset local keyboard+mouse” from Local user control in the OSD (see “Local User Control” on page 5-18). 3. Reset target server to re-initialize the PS/2 ports. Not all computers respond well to hot-swapping mouse connections and can disrupt the port in the process. 4. Verify the mouse type and driver on the target server. 5. Try using another mouse to see if you achieve better results.
The local (attached server) mouse does not respond, or the mouse mapping is wrong.	Remotely reset the mouse through the web control interface or the VNC menu.
The remote (console) mouse moves but the local (attached server) mouse does not.	Be sure the web control interface window is the active window. When you move the mouse, the REMOTE focus on the top-left corner of the web control interface should be highlighted in red.
The remote and local mice move in a non-linear relative motion.	Perform the following steps: 1. Verify that the refresh rate or the mouse setup are configured properly. See ‘. 2. Check the resolution and refresh rate in use. Reduce vertical refresh rate to no higher than 75 Hz and resolution to no higher than 1280 x 1024. 3. On the target server, turn off or set to normal, all operating system-specific adjustments to mouse speed and acceleration. See Figure 3-7 on page 3-12. 4. Verify that the mouse driver on the target server is up-to-date and operating system-generic.

Problem	Suggestion
The remote and local mice are tracking slowly.	Perform the following steps: 1. The cause could be noisy video. Using the web control interface, log into the SLK and the target server, and observe the bandwidth meter on the web control interface window. On a static screen, the indicator should show negligible traffic (less than 20 Kbps). If the indicator is fluctuating or constantly at a higher throughput level, the video source could be noisy, generating unwanted network traffic. This would cause the video feed to appear slow and cause an apparently slow mouse. 2. This may be an indication and the result of network latency. Mouse performance is measured by how quickly the local cursor arrow follows the remote crosshairs.

Video Troubleshooting

Problem	Suggestion
You see **NO INCOMING VIDEO** when trying to view a remote server.	Perform the following steps: 1. Disable or time-out any video overlays, such as KVM switch status, as overlays often generate noise. 2. Select different resolutions and refresh rates within the supported maximum of 1280 x 1024 and 75 Hz. A refresh rate of 60 Hz is highly recommended. Excessive resolution increases network activity as more data is passed from the server to remote. 3. Use minimum acceptable color depth settings. Eight bits are suitable for remote sessions. 4. Try a different video cable. Poor quality cable can contribute to degradation and loss of signal. 5. If none of these suggestions improves the video, use the local console to select the appropriate video settings. If you are using KVM switches in your configuration: 1. Disable or time-out any permanent video overlays showing KVM switch status. 2. Rename the hotkeys on the SLK or the KVM switch if there are conflicts between basic VNC/OSD hotkeys and any “switch” VNC/OSD Hotkeys. See Chapter 9, “Defining Custom Send Keys” on page 9-1.

Problem	Suggestion
You cannot see any local video.	Perform the following steps: 1. Check physical connections between the SLK and the local monitor. 2. Reduce the vertical refresh rate to 75 Hz and resolution to no higher than 1024x768. 3. Disable all energy-saving modes and screen savers. 4. Update the driver of your video card. It may be introducing spurious noise.
The remote video is scrambled.	Perform the following steps: 1. Check your firmware version and try using different video settings. You can obtain the latest firmware updates at www.lantronix.com. 2. Try different resolutions/refresh rates on the target servers.
Video colors are off.	Contact Lantronix Technical Support.
Video is sluggish.	Perform the following steps: 1. Check your firmware version and try using different video settings. To update to the newest firmware, go to www.lantronix.com. 2. Try different resolutions and refresh rates on the target servers.
Video is not updating.	Perform the following steps: 1. Open and close the connection to see whether the problem gets resolved. 2. From the web control interface, click the **Disconnect** button; then click the **Connect** button. 3. From the VNC viewer, close and reopen the VNC session.

Problem	Suggestion
You see black video when opening a browser session.	If the connect/disconnect options keep toggling, and you can connect locally through VNC and Telnet, this could be a configuration issue. Be sure the Java plug-in is installed. Use only the latest release of Java 2 runtime environment (J2RE). (See www.java.com.) Check the “Java-Viewer port number (clear)” and “JavaViewer port number (SSL)”. These must be different port numbers than the Web server, whose default is 80 and 443. Reset the two ports to the factory-default settings of 19900 and 19901 respectively.
There is a black bar to the left and/or top of your screen.	Part of the image is cut off at the left or top edge of the screen: ❖ This should not occur in any VESA-standard video mode. Switch to a typical video mode (1024x768 at 60 Hz, for example). Note that some video cards do not generate VESA modes precisely, so this may not help. ❖ If using a non-standard VESA mode, or an unknown video source, use VNC to correct the position error manually: a) Start VNC and enter the VNC menu. b) Press  twice. c) Use the arrow keys to move the screen around. ❖ If black bars are showing, move left (or up) until the first non-black area touches the edge of the VNC window. ❖ If the screen is cut off, move the window right (or down) a large amount (the edge will smear). Press  to quit the menu. This causes a redraw. Start the process over. Press **Esc** at any time to redraw the whole screen and check the result. The VNC screen is an approximation of the new position. You can fine-tune the position by observing the remote mouse position relative to the VNC local cursor (small box). When the two are precisely aligned you should have the optimal screen position. The SLK remembers the new X,Y position automatically. You may need to repeat this process for other video modes.

8: Uploading Flash Files and Certificates

This chapter describes how to upload flash files and certificates. Topics in this chapter include:

Uploading Firmware

The firmware-upload procedure consists of the following steps:

1 Check the current version of the SLK’s firmware.

2 Download the latest firmware from the Lantronix Web site.

3 Upload the firmware to the SLK’s Flash memory.

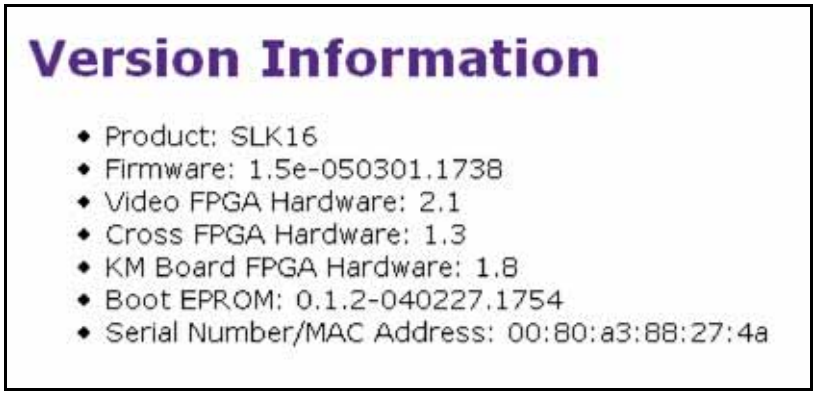
Checking the Current SLK Firmware Version

Before you upgrade the SLK firmware, check the current firmware version. If your installed version matches the most recent version available on the Lantronix Web site, no download is necessary.

1 Click the **Version** button on the web control interface menu (see “Viewing Version Information” on page 4-48).

2 Note the Firmware identification string. This string should be similar to the one in Figure 8-1.

Figure 8-1. Example of a Version Number



Downloading Firmware from the Lantronix Web Site

Go to the Lantronix Web site at www.lantronix.com and see whether the latest firmware version is the one currently installed in your SLK. If it is, you do not need to download the firmware.

Firmware upgrades and release notes are in zipped format. The zip file contains a Flash file with the extension `.frm` along with release notes. You can review the release notes to see whether upgrading the firmware will benefit you.

Uploading Firmware to Flash

After you download firmware from the Lantronix Web site, you can upload it into the SLK. Uploading firmware is a straightforward operation. However, if you upload the wrong version, recovery can be time-consuming.

To upgrade the SLK Flash files:

1 Start the web control interface and go to the SLK home page.

2 In the menu pane on the left, under **Operation**, click **Flash File System**.

3 In the Flash File System page, under **Upload File to Flash**, click **Browse**.

Figure 8-2. Controls for Locating and Uploading Firmware

4 Click the correct `.frm` file you downloaded from the Lantronix Web site; then click the **Start Upload** button to upload the firmware to the SLK Flash memory.

5 After the firmware has been uploaded, a message tells you that upload was successful. Click the **Reboot now** link in the bottom-right corner of the Flash File System page. Reboot disconnects you and logs you out of your current session.

6 Log in again to the web control interface.

7 From the home page, under **Information,** click **Version** to confirm that the new firmware has been installed successfully.

Note: *Some versions of Internet Explorer cannot upload the firmware image (or any other file) if any part of the file path contains a space. If this occurs, the message* ***file not found*** *appears when you try to upload the firmware. One solution is to use Netscape, which accepts space. Another solution is to move the firmware file to another directory that does not contain spaces in its file path.*

Using Security and Encryption

SecureLinx SLK Remote KVMs provide security on several levels, including Secure Sockets Layer (SSL) encryption. For this feature to work, install a valid server certificate and key into the SLK. You can purchase certificates and keys from many sources.

Using SSL with a Browser

If you use a browser, you must have the **Sun Java Plug-in 1.4.0** or higher installed to take advantage of SSL encryption. The Java plug-in can be obtained from Sun Microsystems at: www.java.sun.com/products/plugin/index.html. Alternatively, you can search the Web for the keywords “Sun,” “Java,” and “plugin.”

Using SSL without a Browser

SSL is not available through VNC. Consequently, some type of browser is required.

Locating Internet Resources

A site that offers official certificates is www.thawte.com. You can locate other certificate providers on the Web by searching using keywords *SSL* and *certificate.*

Uploading Certificates

After you obtain a certificate and key, unzip them if necessary and upload them to the SLK’s Flash memory.

Note: *The files to be uploaded must have suitable extensions. The certificate and key must be in PEM format and the name of the files should be* `servercert.crt` *and* `server-cert.key`*.*

1 Start the web control interface and go to the SLK home page.

2 In the menu pane on the left, under **Operation**, click **Flash File System**.

3 In the Flash File System page, under **Upload File to Flash**, click **Browse**.

Figure 8-3. Controls for Locating and Uploading Firmware

4 Click the first file (certificate or key) you want to upload; then click the **Start Upload** button to upload the file to the SLK's Flash memory. When the upload finishes, repeat this step for the other file (certificate or key) you need to upload.

5 After the files have been uploaded, click the **Reboot now** link in the bottom-right corner of the Flash File System page. Reboot disconnects you and logs you out of your current session.

6 Log in again to the web control interface.

7 From the home page, under **Operation,** click **Flash File System** to confirm that the new certificate has been installed successfully.

Note: *Uploading corrupted or incorrect files can render your SLK inoperable. If this occurs, contact Lantronix for assistance.*

9: Defining Custom Send Keys

The Send Keys feature provides pre-programmed “hot” keys for functions that require specific key combinations. The SLK comes pre-configured with an extensive list of the most common key combinations (for example, **Ctrl+Alt+Delete**). If an attached server requires a new key combination, you must create a custom key file. Once you create the file, you select your new keys from **Custom Keys** on the **Send** menu.

Custom Key Creation

To customize send keys values on an SLK, you need to create and upload a file with an extension of `.jvcf`. You can create the file using a simple text editor such as Windows Notepad. (There is not an existing `.jvcf` file that can be edited.)

The file name is not important, but it must be saved with the `.jvcf` file extension. (Please see “Examples” on page 9-2 for appropriate syntax.) Examples of file names are:

```
custom.jvcf
sendkeys.jvcf
```

The flash system only allows one `.jvcf` file, so this file must include all of the desired custom key sequences.

Once you create the custom key sequence file, you upload it using the Flash File System page in the web interface. (See “Flash File System” on page 4-17.)

Browsers will not recognize the new keyboard macros until the browser has been closed and re-opened (this will re-load the new applet). If the custom keys do not display in the **Custom Keys** option of the **Send** menu after the browser has been re-opened, the new `.jvcf` file may have a syntax or typographical error. Delete the file (from the Flash File System page), review the `.jvcf` file, and then reload the file.

Custom Key Guidelines

Definitions

- [keylist] indicates beginning of document.
- [newitem] “Itemname” indicates beginning of item description with “Itemname” being the descriptor.
- [end] indicates end of item description.
- [down] indicates depress and hold key commands listed hereafter.
- [up] indicates release key commands listed hereafter.
- [type] indicates depress and release key commands hereafter.

Requirements

- Each key command has to be separated from the next by a space.
- The hex equivalent of the key command can be used in its place.
- The hex equivalent has to be in the format 0x0041. (See “Potential Send Keys” on page 9-3.)
- Upload the file as you would a firmware upgrade, but you do not need to reset the device.
- When loading the new configuration file, make sure all browsers are closed and a new session is started.

Examples

The following script is an example of creating new keys in a `.jvcf` file:

```
[keylist]

[newitem] "Ctrl-Alt-Del"
          [down] CONTROL ALT DELETE
          [up] DELETE ALT CONTROL
[end]

[newitem] "Ctrl-Esc"
          [down] CONTROL ESCAPE
          [up] ESCAPE CONTROL
[end]

[newitem] "Alt-Esc"
         [down] ALT ESCAPE
         [up] ESCAPE ALT
```

```
[end]

[newitem] "L+RShift+Alt-Esc"
          [down] LShift RShift ALT ESCAPE
          [up] ESCAPE ALT RShift LShift
[end]

[newitem]"TAB"
          [type] TAB
[end]

[newitem] "Shift-TAB"
          [down] SHIFT TAB
          [up] TAB SHIFT
[end]

[newitem] "Print Screen"
          [type] PRINTSCREEN
[end]
          [newitem] "Print Screen, Print Screen"
          [type] PRINTSCREEN PRINTSCREEN
[end]

[newitem] "Scroll Lock"
          [type] SCROLL_LOCK
[end]

[newitem] "2xScroll Lock"
          [type] SCROLL_LOCK SCROLL_LOCK
[end]
```

Potential Send Keys

The following is a list of potential send keys and the appropriate command or hex values to identify that keystroke in a `.jvcf` file.

Custom Send Key

[keylist]	indicates beginning of document
[newitem] “Itemname”	indicates beginning of item description with “Itemname” being the descriptor
[end]	indicates end of item description
[down]	depress and hold key commands listed hereafter
[up]	release key commands listed hereafter
[type]	depress and release key commands hereafter

- each key command has to be separated from the next by a space
- the hex equivalent of the key command can be used in its place
- hex equivalent has to be in the format of eg 0x0041
- once created upload file much like a firmware upgrade but no need to reset device
- make sure all browsers are closed and new session is started to load the new configuration file

Virtual Keycodes supported by J2RE

Key	Command	Hex	
Enter	ENTER	000A	✓
Backspace	BACK_SPACE	0008	✓
Tab	TAB	0009	✓
Cancel	CANCEL	0003	
Clear	CLEAR	000C	
Shft	SHIFT	0010	✓
Control	CONTROL	0011	✓
Alt	ALT	0012	✓
Pause	PAUSE	0013	✓
Caps Lock	CAPS_LOCK	0014	✓
Escape	ESCAPE	001B	✓
Space	SPACE	0020	✓
Page up	PAGE_UP	0021	✓
Page down	PAGE_DOWN	0022	✓
End	END	0023	✓
Home	HOME	0024	✓
Left	LEFT	0025	✓
Up	UP	0026	✓
Right	RIGHT	0027	✓
Down	DOWN	0028	✓
,	COMMA	002C	✓
-	MINUS	002D	✓
.	PERIOD	002E	✓
/	SLASH	002F	✓
0	0	0030	✓
1	1	0031	✓
2	2	0032	✓
3	3	0033	✓
4	4	0034	✓
5	5	0035	✓
6	6	0036	✓
7	7	0037	✓
8	8	0038	✓
9	9	0039	✓
;	SEMICOLON	003B	✓
=	EQUALS	003D	✓
a	A	0041	✓
b	B	0042	✓
c	C	0043	✓
d	D	0044	✓
e	E	0045	✓
f	F	0046	✓
g	G	0047	✓
h	H	0048	✓
I	I	0049	✓
j	J	004A	✓
k	K	004B	✓
l	L	004C	✓
m	M	004D	✓
n	N	004E	✓
o	O	004F	✓
p	P	0050	✓
q	Q	0051	✓
r	R	0052	✓
s	S	0053	✓
t	T	0054	✓
u	U	0055	✓
v	V	0056	✓
w	W	0057	✓
x	X	0058	✓
y	Y	0059	✓
z	Z	005A	✓
(	OPEN_BRACKET	005B	✓
\	BACK_SLASH	005C	✓
)	CLOSE_BRACKET	005D	✓
0 on Num Pad	NUMPAD0	0060	✓

Key	Command	Hex	
1 on Num Pad	NUMPAD1	0061	✓
2 on Num Pad	NUMPAD2	0062	✓
3 on Num Pad	NUMPAD3	0063	✓
4 on Num Pad	NUMPAD4	0064	✓
5 on Num Pad	NUMPAD5	0065	✓
6 on Num Pad	NUMPAD6	0066	✓
7 on Num Pad	NUMPAD7	0067	✓
8 on Num Pad	NUMPAD8	0068	✓
9 on Num Pad	NUMPAD9	0069	✓
*	MULTIPLY	006A	✓
+	ADD	006B	✓
Separator	SEPARATOR	006C	✓
Subtract	SUBTRACT	006D	✓
Decimal	DECIMAL	006E	✓
Divide	DIVIDE	006F	✓
F1	F1	0070	✓
F2	F2	0071	✓
F3	F3	0072	✓
F4	F4	0073	✓
F5	F5	0074	✓
F6	F6	0075	✓
F7	F7	0076	✓
F8	F8	0077	✓
F9	F9	0078	✓
F10	F10	0079	✓
F11	F11	007A	✓
F12	F12	007B	✓
Delete	DELETE	007F	✓
Num Lock	NUM_LOCK	0090	✓
Scroll Lock	SCROLL_LOCK	0091	✓
Printscreen	PRINTSCREEN	009A	✓
Insert	INSERT	009B	✓
Help	HELP	009C	
Meta	META	009D	
Backquote	BACK_QUOTE	00C0	✓
Quote	QUOTE	00DE	✓
Final	FINAL	0018	
Convert	CONVERT	001C	✓
Nonconvert	NONCONVERT	001D	✓
Accept	ACCEPT	001E	
Modechange	MODECHANGE	001F	✓
Kana	KANA	0015	
Kanji	KANJI	0019	
Undefined	UNDEFINED	00FF	✓
Dash	DASH	00BD	✓
Dash	DASH2	0000	✓
Semicolon	SEMICOLON2	00BA	✓
Open Bracket2	OPEN_BRACKET2	00DB	✓
Backslash2	BACK_SLASH2	00DC	✓
Close Bracket2	CLOSE_BRACKET2	00DD	✓
Equals2	EQUALS2	00BB	✓
Comma2	COMMA2	00BC	✓
Period2	PERIOD2	00BE	✓
Slash2	SLASH2	00BF	✓

DV6-Specific Hex Equivalents to keys

Key	Command	Hex	
Apps/ WinMenu	N/A	F001	✓
Power	N/A	F002	✓
Sleep	N/A	F003	✓
Wake	N/A	F004	✓
Left Shift	N/A	FFE1	✓
Right Shift	N/A	FFE2	✓
Left Control	N/A	FFE3	✓
Right Control	N/A	FFE4	✓
Left Alt	N/A	FFE5	✓
Right Alt	N/A	FFE6	✓
Left Windows	N/A	FFE7	✓
Right Windows	N/A	FFE8	✓

A: Specifications

Hardware Specifications

Ethernet

One 10/100BaseT connection

Standard RJ45 connector

LEDs for link, 10/100 indicator, and network activity

VGA Input

Max resolution 1280 x 1024 at 75Hz.

Supports most VESA graphics modes and all text modes

DDC2B compatible

VGA Local Output

Copy of input video with OSD (On-Screen Display) for setup

Optional use; no local screen is required after setup

PS/2 Keyboard / Mouse

Emulates standard PS/2 keyboard and 2-button PS/2 mouse

Keyboard, video and mouse connect directly to server

Keep-alive feature means server is not affected by power failure on the SLK. Server still sees a normal connection for mouse and keyboard.

Local PS/2 Keyboard/Mouse

Allows local access to the controlled server

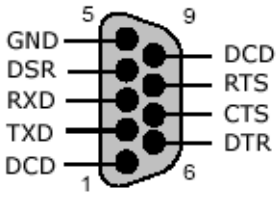
Can be disabled or password protected to limit access

Used for initial setup of network address, subnet mask, etc.

Optional once system is deployed

May be connected/removed without affecting server

Serial Port 1 (RS-232-C)



DB9 Female connector (DCE)

Standard baud rates up to 115,200 bps

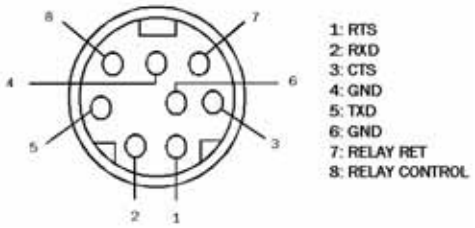
Can be used for multiple functions:

- Telnet access (console server mode). Provides access to a serial console server (e.g., Lantronix SLC) or serial management port of a connected server.
- Watchdog mode. With appropriate server software, the SLK can detect a string pattern which can trigger an alert or kill the power to reset failed software/hardware.
- Power control. When connected to an optional third-party power control unit, the serial port may be used to control the power to multiple computers.
- Log. Outputs the log from the SLK to a serial port.

Serial Port 2

SLK1 and SLK8: have an 8-pin mini-DIN that requires the supplied mini-DIN DB9 adapter (DCE).

SLK16: Identical to Serial Port 1.

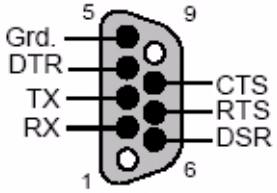


Serial Port 3 (SLK16)

DB9 male connector (DTE)

Functions same as Serial Ports 1 and 2

Additional RS-232-C modem function



Reset

SLK hardware reset switch

Power

Auto-sensing power supply

Input Voltage Range: 100 - 240 VAC

Frequency: 50 - 60 Hz

Max. Input Current:1.5A max. (RMS) @ 115VAC

Fused IEC320 mains connector, detachable power cord

Two 2.5A fast-blow fuses and a power cord provided

Mechanical

Each SLK is a fully independent system

Dimensions (height x width x depth)

SLK1:	1.75 in x 5.7 in x 16 in (4.45 cm x 14.48 cm x 40.60 cm)
SLK8:	1.75 in x 17 in x 12.5 in (4.45 cm x 43.18 cm x 31.75 cm)
SLK16:	3.5 in x 17 in x 11.25 in (8.89 cm x 43.17 cm x 28.58 cm)

Shipping Weight

SLK1:	6 lbs
SLK8:	11 lbs
SLK16:	13 lbs

Painted aluminum sheet-metal construction

Internal

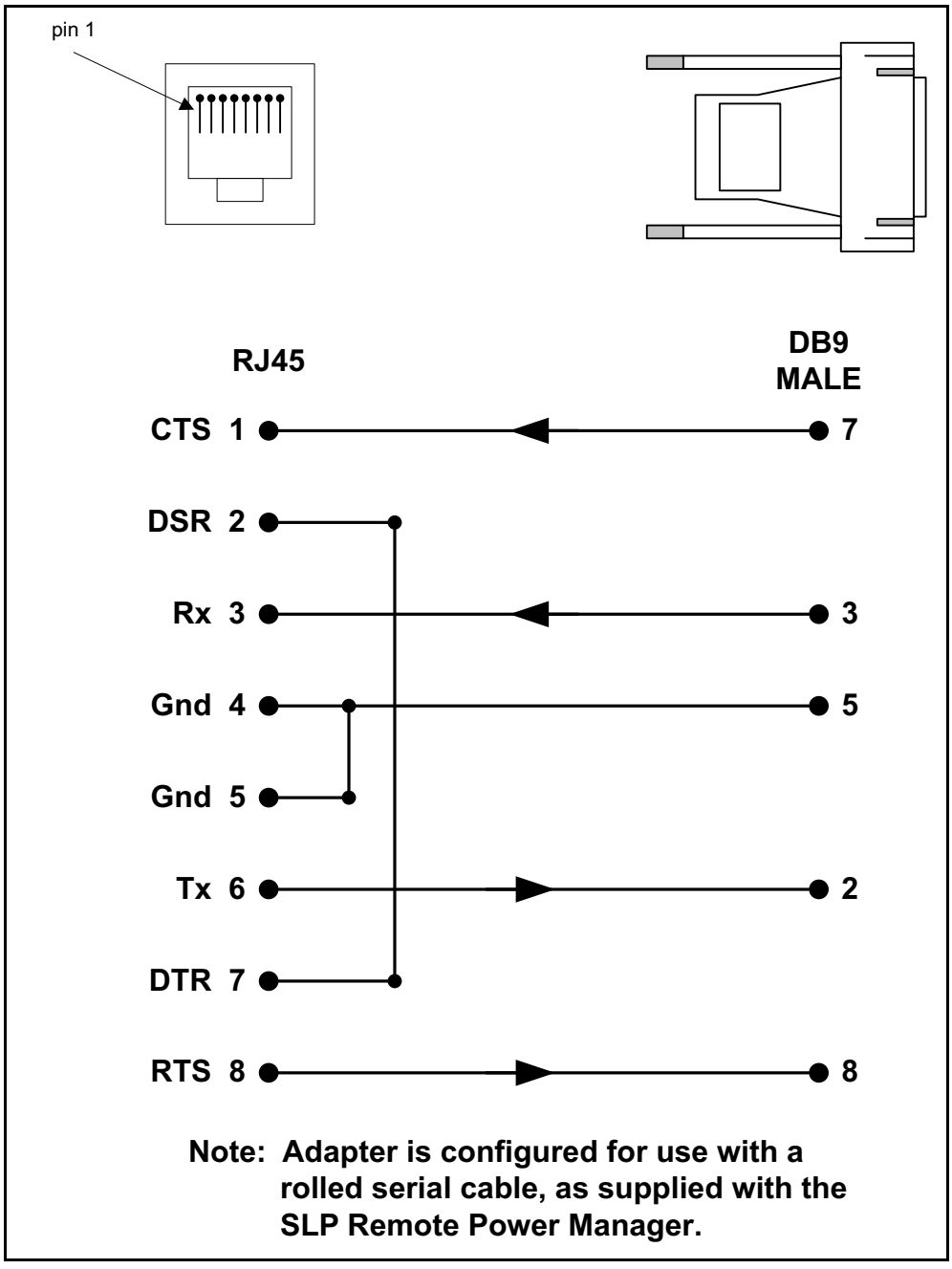
Contains hardware random number generator

Flash-memory-based firmware may be field-upgraded using the web control interface

Dedicated 32-bit micro-processor

RJ-45 to DB9M Adapter

Figure A-1. RJ-45 to DB9M Adapter for Serial Connection of SLP Remote Power Manager



Software Specifications

Network Protocols

HTTP/1.1 and HTTPS (secure) web server used for control and setup

VNC server (implements RFB 3.3 protocol with Hextile encoding)

Requires one dedicated IP address

TCP/IP port numbers for all services may be changed to confuse attackers

SMTP is used to deliver email notifications

Does not require a DNS server (Domain Name Service), so it will continue to operate during this network failure

System Software

Specialized RTOS (Real Time OS)

Proprietary software, with published open-standard based interfaces

System Requirements

Web browser: Microsoft Internet Explorer 6+ with Java plug-in JRE 1.4.0

Optional VNC viewer supports version 3.3 of RFB protocol

An SMTP server required for email notification feature

Telnet client required for serial port terminal server access

Public Keys/Encryption

Supports X.509 certificates

True hardware RNG (random number generator) used to create session keys and seed values

128-bit or 56-bit encryption for SSL v2

Supports RC4 and DES algorithms

Compatible with both import and export browsers

Special Features

SLK1 and 8: Up to 10 unique users and passwords
SLK16: Up to 32 unique users and passwords

Stealth mode: prevents port scans and other network probes

Turtle mode: disables self when attacked; requires access to local console to re-enable

Idle time-out causes logout from session

Multiple users can connect to same system

Compatible with most existing KVMs

Environment

Operating Temperature	SLK1 and SLK8: 0° to 40° C (32° to 104° F) SLK16: 10° to 40° C (50° to 104° F)
Operating Humidity	40-60%
Storage Temperature	SLK1 and SLK8: -40° to 74° C (-40° to 165° F) SLK16: 0° to 60° C (32° to 140° F)
Storage Humidity	35-70%

Agency Statements

Notification

Warning: changes or modifications to SecureLinx SLK Remote KVMs not expressly approved by Lantronix could void the user's authority to operate the equipment.

Note: 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.

Agency Approvals

- FCC Part 15, Subpart B, Sec. 15.107(B) and 15.109(B). Equipment Class A.
- EUROPEAN CISPR 22:1997 AND EN 55022:1988. Equipment Class A.
- EUROPEAN CISPR 24:1997/EN 55024:1998.
- CAN/CSA-C22.2 No. 60950.00/UL 60950, Third Edition dated Dec. 01, 2000

B: Binary to Hexadecimals

Some of the procedures require you to assemble a series of options (represented as bits) into a complete command (represented as a byte). The resulting binary value must be converted to a hexadecimal representation. Use this appendix to learn to convert binary values to hexadecimals.

Converting Binary to Hexadecimal

Following are two simple ways to convert binary numbers to hexadecimal notation.

Conversion Table

Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, treat the upper and lower four bits separately to produce a two-digit hexadecimal number (in this case, 4C). Use the following table to convert values from binary to hexadecimal.

Table B-1. Binary to Hex Conversions

Decimal	Binary	Hex
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Scientific Calculator

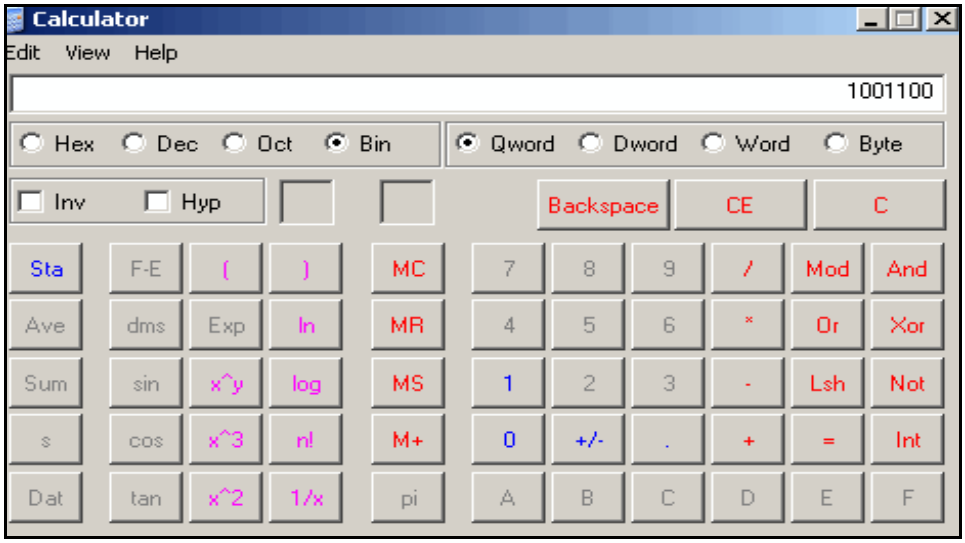
Another simple way to convert binary to hexadecimals is to use a scientific calculator, such as the one available on Windows' operating systems. For example:

1 On the Windows' Start menu, click **Programs**-->**Accessories**-->**Calculator**.

2 On the View menu, select **Scientific**. The scientific calculator displays.

3 Click **Bin** (Binary), and type the number you want to convert.

Figure B-1. Scientific Calculator with Binary Values



4 Click **Hex**. The hexadecimal value displays.

Figure B-2. Scientific Calculator with Hex Value

C: Glossary

This appendix defines the technical terms in this User Guide.

Authentication	The process of identifying an individual, usually based on a username and password.
Channel	The path between the SLK unit and the target server being managed. The SLK1, SLK8, and SLK16 support one, eight, and 16 channels, respectively.
Compression	Storing data in a format that requires less space than usual.
Cookie	A message given to a web browser by a web server. The browser stores the message in a text file. The message is then sent back to the server each time the browser requests a page from the server. The main purpose of cookies is to identify users and possibly prepare customized web pages for them.
Data Terminal Equipment (DTE)	A device that controls data flowing to or from a computer. The term is most often used in reference to serial communications defined by the RS-232-C standard.
Debug	To find and remove errors (bugs).
Default gateway	The gateway in a network that a computer uses to access another network.
Home page	The main page of the SLK web control interface. The home page serves as the starting location for managing the SLK.
HTTPS	HTTPS (HTTP Secure Socket Layer) uses a default port number of 443 (80 for HTTP) and automatically performs SSL negotiation that sends data in encrypted form (that is, web servers accessed through HTTPS have to be “secure web servers”).
IP address	An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, `216.254.154.11`.
KVM switch	Short for keyboard, video, mouse switch: a hardware device that allows a single keyboard, video monitor, and mouse to control more than one computer one at a time.
Local port	A port on the back of the SLK that accepts a single keyboard, video monitor, and mouse from a local computer that will be used to manage the target servers.
Master account password	The password you enter to perform administrative activities using the web control interface.

Modem init string	A series (string) of commands sent by modem software to initialize the modem. These commands configure the modem's options for parameters such as error correction, data compression, and flow control. Init strings are fairly specific to each modem. Not all programs use init strings. Some use settings files such as Windows `.inf` files.
Point-to-Point Protocol (PPP)	A data link protocol that provides dialup access over serial lines by encapsulating protocols in specialized packets. These packets can be used to replace a failed network connection and allow remote users to log onto the network as if they were in-house.
On Screen Display (OSD)	An alphanumeric, character-based interface for configuring SLK units. The OSD provides minimal prompting and guidance.
RJ45	Short for Registered Jack 45, an 8-wire connector used commonly to connect computers onto Local Area Networks (LANs). RJ45 connectors are wider and have more pins than the ubiquitous RJ11 connectors used for connecting telephone equipment.
Secure Sockets Layer (SSL)	A protocol for transmitting private documents over the Internet. SSL works by using a private key to encrypt data that has been transferred over the SSL connection.
VNC/OSD Hotkeys	A customized set of preprogrammed escape sequences.
SNMP	Short for Simple Network Management Protocol, a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.
Stealth mode	An operating mode that disables the SLK to prevent unauthorized access.
Subnet	Part of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP addresses have the same prefix. For example, all devices with IP addresses that start with `216.254.154` are part of the same subnet. Dividing a network into subnets is useful for security and performance. IP networks are divided using a subnet mask.
Turtle mode	An operating mode that disables the SLK when attacked.
Virtual Network Computing (VNC)	VNC is remote-control software that lets you view and interact with one computer using a simple program on another computer anywhere on the Internet. VNC is freely and publicly available.
Web control interface	A graphical interface for configuring SLK units. The web control interface is browser based and lets you perform configuration activities by pointing and clicking your mouse.

Warranty

Lantronix warrants each Lantronix product to be free from defects in material and workmanship for a period of TWO YEARS. During this period, if a customer is unable to resolve a product problem with Lantronix Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of a RMA number, the customer shall return the product to Lantronix, freight prepaid. Upon verification of warranty, Lantronix will -- at its option -- repair or replace the product and return it to the customer freight prepaid. If the product is not under warranty, the customer may have Lantronix repair the unit on a fee basis or return it. No services are handled at the customer's site under this warranty. This warranty is voided if the customer uses the product in an unauthorized or improper way, or in an environment for which it was not designed.

Lantronix warrants the media containing its software product to be free from defects and warrants that the software will operate substantially according to Lantronix specifications for a period of 60 DAYS after the date of shipment. The customer will ship defective media to Lantronix. Lantronix will ship the replacement media to the customer.

In no event will Lantronix be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss of equipment, plant or power system, cost of capital, loss of profits or revenues, cost of replacement power, additional expenses in the use of existing software, hardware, equipment or facilities, or claims against the user by its employees or customers resulting from the use of the information, recommendations, descriptions and safety notations supplied by Lantronix. Lantronix liability is limited (at its election) to:

- Refund of buyer's purchase price for such affected products (without interest).
- Repair or replacement of such products, provided that the buyer follows the above procedures.

There are no understandings, agreements, representations or warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out above or by any existing contract between the parties. Any such contract states the entire obligation of Lantronix. The contents of this document shall not become part of or modify any prior or existing agreement, commitment or relationship.

For details on the Lantronix warranty replacement policy, go to our web site at http://www.lantronix.com/support/warranty.html.

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