

## SL-1 Serial LAN Extender

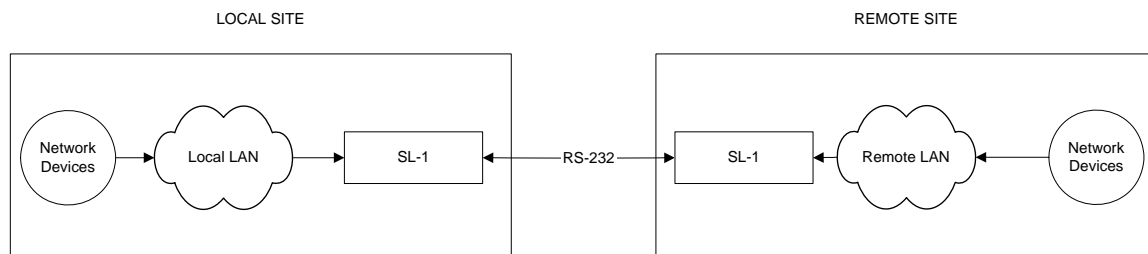
### User's Guide



The Burk Technology SL-1 Serial LAN Extender allows remote network devices to connect to the local network over a bidirectional full-time serial link. The SL-1 operates in pairs, with one unit at each end of the serial link. Since both units operate on the same subnet, network traffic is easily passed between the two locations. To optimize bandwidth efficiency, the SL-1 learns the location of each network device and transports only those packets destined for the opposite side of the bridge.

Once configured and installed, the local LAN and remote LAN are connected as though all network devices were collocated, as shown below:

### SL-1 Network Diagram



### Specifications

Dimensions:	5"L x 5"W x 1"H
Power:	6VDC wall adapter (provided)
Serial Connectivity:	User configurable from 9.6 kbps to 115.2 kbps
Ethernet Connectivity:	10BaseT
Operating Temperature:	0-50°C

## Configuration

Before connecting the SL-1 to the LAN/WAN or your serial link, connection settings on both SL-1 units must be configured via a direct PC connection. To establish a connection in configuration mode:

1. Connect a null modem cable between a COM port on your PC and the SL-1 DB-9M connector marked RS-232.
2. Open a terminal application (such as HyperTerminal) on the COM port you are using, with these connection settings: 9600 baud, 8 data bits, no parity, and 1 stop bit (9600-8-N-1).
3. Apply power to the SL-1 while pressing the CONFIG button. When the SL-1 powers up in configuration mode, the POWER LED blinks.
4. HyperTerminal will display the SL-1 configuration menu, which will guide you through the setup process. If you make a mistake, cycle power while holding the CONFIG button to restart the process.
  - **Baud Rate:** Choose the data rate of the serial link you will be using with the SL-1.
  - **Parity:** Indicate whether the link uses Even, Odd or No Parity.
  - **Flow Control:** Specify whether the link requires hardware handshake or no handshake.
  - **Address Resolution Protocol (ARP) Table Timeout:** The SL-1 maintains a list of MAC addresses and determines whether each MAC address is local or remote. After a period of inactivity, the SL-1 discards this data. The default setting of 15 minutes may need to be extended if address resolution errors occur once the SL-1 is placed in service.
  - **Allow Broadcast Packets:** Broadcast packets are directed to all computers on the network. In business-class networks, this may reduce the efficiency of the SL-1. Your IT administrator will be able to tell you whether your network requires broadcast packets. If there is no specific application for broadcast packets, disable them in the SL-1 configuration.
5. After you enter the final configuration item, the SL-1 will save these changes. When you are done, remove the null modem cable from the RS-232 port on the SL-1 and cycle power on the unit.
6. After you have configured the first SL-1, repeat the process above so that both SL-1s in the pair have the same settings.

*Note: to view the currently saved configuration settings for any SL-1, open a 9600-8-N-1 HyperTerminal connection, connect the SL-1 to the COM port using a null modem cable, and cycle power (do not press the CONFIG button). HyperTerminal will display the SL-1 firmware version number and the configuration settings.*

## Installation

The SL-1 can be installed anywhere near your serial hardware and within reach of an Ethernet hub or switch. The enclosure is equipped for optional wall mounting using #8 hardware.

## Establishing Ethernet and Serial Links

After configuring the SL-1, connect it to your Ethernet switch using the SL-1 port marked ETHERNET. Connect it to your serial link using the port marked RS-232. For serial hardware with a male connector, this will typically require a null modem cable. For serial hardware with a female connector, this will typically require a straight-through cable. The 9-pin male connector on the SL-1 has pinouts shown below.

RS-232 Port Pinouts	
2	RX
3	TX
5	GND
7	RTS
8	CTS

Once both SL-1s are connected to the LAN on opposite ends of the serial link, the units will begin transporting IP packets across the serial bridge. The LEDs on either side of the DB-9 connector indicate that serial data is being transmitted or received. The amber LED on the RJ-45 connector indicates an Ethernet link, and the green LED indicates activity.

## Troubleshooting

### Bench Testing

To observe SL-1 performance with a particular network device, it is possible to connect a pair of SL-1s on the bench. After configuring both SL-1s, connect the two with a DB-9F to DB-9F null modem cable. Connect your network device to one of the SL-1s using a crossover cable, and connect your Ethernet switch to the other SL-1. A computer on the network will now be able to communicate with the network device that you connected to the SL-1.

### Connection Trouble

It is possible that the PC has stored the address location in memory, preventing the SL-1 from discovering it. From a command prompt, enter the command `ARP -D` to clear the PC's ARP table. When you retry the connection to the remote IP address, the PC will send an ARP request, which allows the PC and SL-1 to discover the location of the IP address.

A similar situation occurs when the SL-1 has been configured to clear inactive ARP table entries more frequently than the PC. If this happens, the SL-1 will clear its ARP table while the PC retains ARP data, preventing the SL-1 from rediscovering the location the IP address. Extending the ARP table timeout entry in the SL-1 configuration should resolve this problem.

### General

The serial link on which the SL-1 operates subjects network traffic to slower speeds and greater latency than a typical network. It is normal for software and network devices to perform more slowly over the RS-232 connection than if they were connected directly via Ethernet.

### **Getting Help**

Product support is available online at [www.burk.com](http://www.burk.com). To reach a Burk Technology customer support representative, please email [support@burk.com](mailto:support@burk.com) or call 978-486-3711. Our office hours are Monday-Friday, 9AM to 5PM Eastern.

### **Warranty**

Burk Technology, Inc. warrants the SL-1 Serial LAN Extender to be free of defects in materials and workmanship for a period of 24 months from the date of purchase. Equipment will be repaired or replaced at the option of Burk Technology and returned freight prepaid to the customer. Damage due to abuse or improper operation or installation of the equipment or caused by fire or flood or harsh environment is not to be covered by this warranty. Damage in shipping is not the responsibility of Burk Technology. A return authorization must be obtained before returning any equipment. Materials returned under this warranty must be shipped freight prepaid and insured in the original shipping carton or suitable substitute to Burk Technology, Inc., 7 Beaver Brook Road, Littleton, MA 01460. Repairs not covered under this warranty will be made at prevailing shop rates established by Burk Technology.

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