PERKIN-ELMER

MULTIDROP STAT MUX

With 4800-Baud Modem

Typical
Customer
Configuration
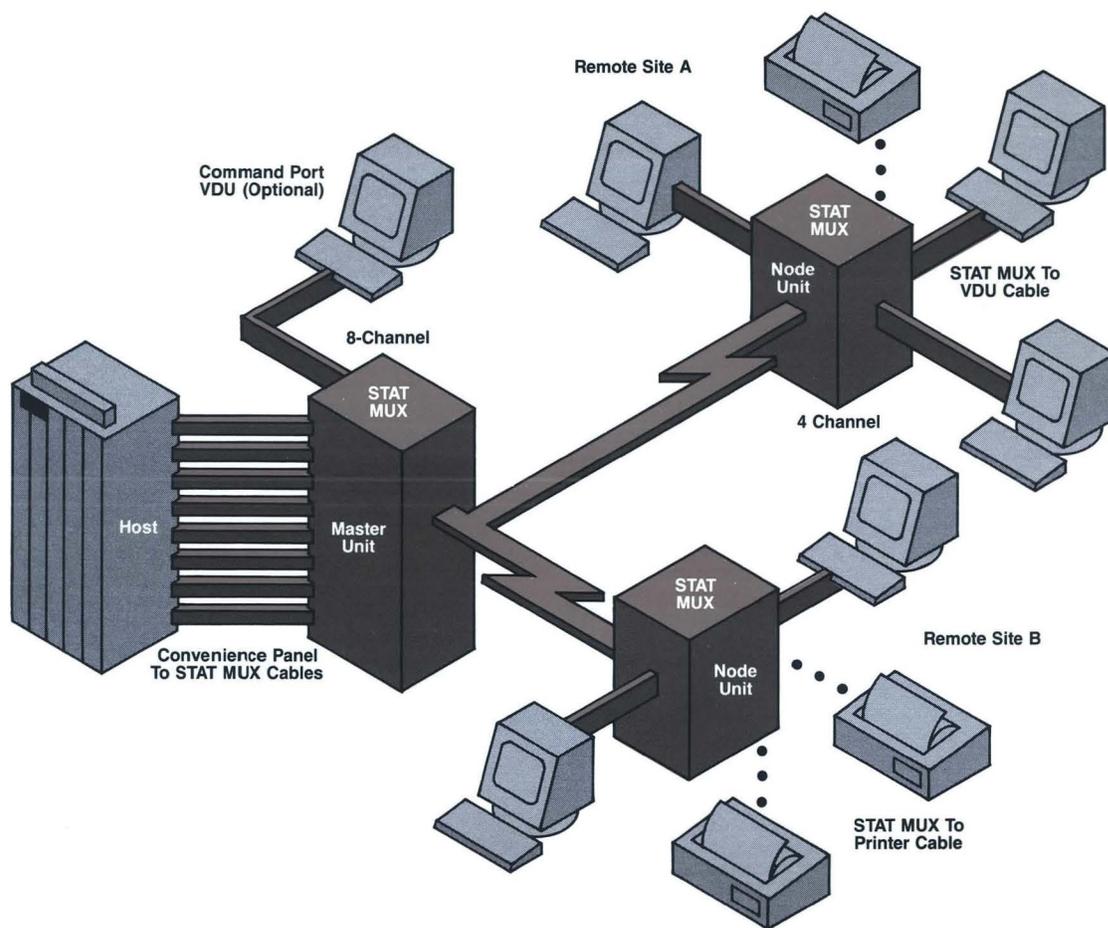
Product Description

The Perkin-Elmer Multidrop Statistical Multiplexor (STAT MUX) is a uniquely designed high-speed data concentrator with integral modem. Specially designed microprocessor-based technology and statistical algorithms handle high throughput in the most efficient manner. A data buffer with flow control and overflow warning assists in preventing data loss.

A Multidrop STAT MUX system consists of one master STAT MUX located at the host computer site and two or more STAT MUX node units located at the remote terminal/printer sites. The largest master can accommodate up to 16 single-channel node units. Configurations consisting of a master with less channel capacity and/or node units with more channels are available to suit individual needs. However, the aggregate channel amount of the node units cannot exceed the channel quantity of the master. Each channel at the master STAT MUX represents one RS-232 port at the host computer site while each channel at the node units represents one printer or terminal.

All STAT MUX master and node units contain integral 4800-baud modems to supply a single-source solution while eliminating recurring modem costs. Communication between the master and its node units is continuous with automatic retransmission-on-error.

Using a multidrop, leased telephone line, all remote lines operate transparently to each other. This significantly reduces multiple telephone line costs while maintaining an error-free link between the host and each remote terminal.

Product Description (Continued)	Data transmission between the STAT MUXs and host CPU and remote terminals/printers occurs via RS-232C interfaces with asynchronous data rates up to 4800 baud. The composite link between the master and node units is synchronous at 4800 baud. Printers and terminals may be connected to the same STAT MUX node unit which eliminates the need for individual lines and modems for each device.

Numerous switch-selectable features which allow the user to determine system configuration include data compression, line equalizer, and built-in diagnostics. Each master STAT MUX contains a user Command Port for on-line testing, node and channel monitoring and configuration, message broadcasting, and system reporting.

These units are simple to install, easy to configure and require no special software modifications at the host for support. A front panel LED constantly exhibits channel and system status, while comprehensive built-in diagnostics isolate faults quickly.

Features

- Connection for up to 16 remote terminals/printers at separate sites to a central host via RS-232C channel interface
- One, two, four or eight terminals/printers (channels) per remote site
- Automatic retransmission-on-error and flow control to provide error-free communications
- Asymmetrical channel speeds
- XON/OFF or RTS/CTS buffer control
- Background task (low-priority mode) operation for up to seven channels
- A 14k byte data buffer for all master and 4 or 8-channel node units
- A 2.5k byte data buffer for 1 and 2-channel node units
- Command port control
- Self-test with fault detection display
- Line equalizer
- No unique software requirements
- Compatible with all Perkin-Elmer Series 3200 systems

Optional Features

- Rack-mount kit*
- 2400-baud integral modems*
- Command Port cable (K54-250)
  *Available by special quote only

Operational Characteristics

The Multidrop STAT MUX is available in 4, 8, or 16-channel master units and 1, 2, 4, or 8 channel node units. A typical configuration consists of a master STAT MUX at the host site connected to two or more remote node units through a 4-wire, multidrop, leased telephone line. The master continuously polls all nodes for data while controlling all data transfers, thereby, eliminating the need for additional hardware. The multiplexing technique, poling, data transmission, and diagnostic procedures are all microprocessor-controlled.

The host or terminal-to-STAT MUX data rates can be set for 110 to 4800 baud asynchronous transmission, while the composite (STAT MUX-to-STAT MUX) link rate is fixed at 4800 baud.

All masters, including the 4 and 8-channel node units contain a 14kb buffer for incoming data storage. The 1 and 2-channel node units contain a 2.5kb data buffer, and flow control prevents buffer overflow during periods of continuous peak activity. At 50% of buffer capacity, the STAT MUX begins to flow control from the most active channel using XOFF/XON or RTS/CTS buffer control. As the buffer continues to fill, this action is gradually extended to all channels. When the buffer is about 75% full, a warning indicator light appears, and the STAT MUX limits data flow from all active channels. An XON character is automatically sent to restart all suspended channels when the buffer goes below 62% of its capacity.

A command port is provided at the master STAT MUX via an RS-232C interface. Through this port, the user can conveniently perform configuration and operational testing and change parameters such as node and channel configurations, system clock time, channel baud rates, stop bits, parity, and flow control. The user can perform tests, receive alarm messages, monitor channel activities, and review periodic system reports at the command port terminal. The command port can also assist in diagnosing telephone line and modem problems.

Configuration Suggestions

Caution must be used when configuring a system using multidrop STAT MUXs and Block Mode transfer terminals that do not respond to flow control. The user must be alert to the possibility of the amount of data being transmitted by the terminals exceeding the buffer capacity of the STAT MUX. This condition will be most severe at remote sites using 1 and 2-channel node units since they have buffer capacities of 2500 bytes, while the 4 and 8-channel units have buffer capacities of 14000 bytes.

To avoid losing data, the amount of data transmitted by all terminals on a node unit during a 10-second interval should be less than or equal to the buffer capacity of the node. For example, a two-channel node unit should have a maximum throughput of 2500 bytes/10 seconds or 250 bytes/second. If both devices on the node unit are terminals, then the maximum throughput per channel should be held to 125 bytes/sec./channel. If one device were a terminal and one were a printer, then the terminal could be allowed a higher throughput (up to 250 bytes/sec.) because the printer data flow is the opposite direction and responds to flow control.

The following table lists the maximum average throughput per channel for the STAT MUX node units (assuming all devices are terminals).

Node Unit	Maximum Burst Throughput
1-channel	2500 bytes/10 sec./chan.
2-channel	1250 bytes/10 sec./chan.
4-channel	3500 bytes/10 sec./chan.
8-channel	1750 bytes/10 sec./chan.

| | Configuration Suggestions (Continued) | A second condition to note occurs at the composite link where the average sustained system throughput reaches approximately 480 bytes/second. (This limit is due to the integral 4800-baud modems used to communicate between the master and node units.) To avoid potential problems, the sustained system throughput (data transmitted in both directions) must be held below 480 bytes/second. Note, 480 bytes/second is a theoretical maximum; the actual throughput must be held somewhat lower to allow for the system overhead of polling, status collecting, error retransmission, etc. |

Configuration Suggestions (Continued)

A second condition to note occurs at the composite link where the average sustained system throughput reaches approximately 480 bytes/second. (This limit is due to the integral 4800-baud modems used to communicate between the master and node units.) To avoid potential problems, the sustained system throughput (data transmitted in both directions) must be held below 480 bytes/second. Note, 480 bytes/second is a theoretical maximum; the actual throughput must be held somewhat lower to allow for the system overhead of polling, status collecting, error retransmission, etc.

Lastly, two areas of concern are the aggregate data rate for the multidrop STAT MUX unit and the maximum channel baud rate. On all multiple-drop STAT MUX units, the maximum channel baud rate is 4800 baud.

The following table lists the maximum aggregate data rates for the multidrop STAT MUX units. The aggregate data rate for each unit is the sum of the BAUD RATES of all of the enabled (configured in system) channels on that unit.

Unit	Aggregate Data Rate
4-channel master	38400 baud
8-channel master	76800 baud
16-channel master	76800 baud
1-channel node	9600 baud
2-channel node	9600 baud
4-channel node	19200 baud
*8-channel node	19200 baud

* When using an 8-channel node, all channels cannot be set to 4800 baud. The baud rate of some or all channels must be reduced so that the total does not exceed 19200 baud. For example, all eight channels could be run at 2400 baud, or two channels at 4800 baud and six at 1200 baud. Note that unused channels (not configured in system at master unit) are not included in the aggregate data rate calculation. Therefore, a configuration such as three channels at 4800 baud and two channels at 2400 baud is acceptable as long as the three remaining channels are not included in the system.

Safety Standards

The Multidrop STAT MUX product is UL approved and CSA and FCC Certified, and is designed for VDE approval. This equipment complies with the requirements in part 15 of FCC rules for class A computing devices.

Specifications STAT MUX

Channel Quantity:
Master Units: 4, 8, and 16
Node Units: 1, 2, 4, and 8

Data Transfer Rate:
Channel: 110, 300, 600, 1200, 1800, 2400, or 4800 baud asynchronous

Composite Link:
4800 baud

Buffer Size:
Master Units: 14k bytes
4- and 8-Channel Node Units: 14k bytes
1- and 2-Channel Node Units: 2.5k bytes

Buffer Overflow:
XOFF begins at 50% of buffer capacity with a warning light and all channel flow control at 75%.

Displays:
Active Mode, Node Sync, Composite Loopback, Retransmission Request, Link Alarm, Buffer Overflow, Self-Test Failure, Remote Alarm, Line Equalizer, RTS, CTS, Transmit Data, Receive Date, and Data Carrier

Diagnostics:
Self-Test; Terminal-Activated Channel Test (TACT), Local and Remote Composite Loopback Tests, Local and Remote Modem Line Tests

Configuration:
Switch and/or command port selectable

MTBF:
20,000 hrs.

Modem

Data Transfer Rate:
4800 baud

Carrier Frequency:
1800 Hz

Modulation:
8 phase, differentially coherent, phase shift keying

Equalization Time:
50 ms

Line Equalizer:
Automatic adaptive for 3002 unconditioned lines

Line Impedance:
600 ohm

Line Requirements:
4-wire, leased, multiple-drop, unconditioned, Type 3002

RTS/CTS Delay:
50/150 ms

Carrier Detect Level:
OFF to ON: -34 dBm
ON to OFF: -39 dBm

Transmitter Output Level:
0 to -12 dBm in -2 dB increments

Physical Dimensions

4 & 8-Channel Master Units
Height: 10 cm (4 in.)
Width: 32 cm (12.8 in.)
Depth: 29 cm (11.3 in.)
Weight: 13-31 kg (6-14 lbs)

16-Channel Master & All Node Units
Height: 15 cm (5.5 in.)
Width: 32 cm (12.8 in.)
Depth: 29 cm (11.3 in.)
Weight: 13-31 kg (6-14 lbs)

Electrical Requirements	**Voltage** 90 to 128 VAC 180 to 256 VAC **Frequency** 50/60 Hz, ± 2 Hz **Phase** Single	**Power** 1 & 2-Channel Unit: 30 watts 4 Channel Unit: 40 watts 8 Channel Unit: 52 watts 16 Channel Unit: 75 watts **Line Cord Plug** 3-wire grounded

Environmental	Operating Temperature: 0° to 45°C (32° to 114°F) Storage Temperature: −10° to 50°C (14° to 120°F) Operating Humidity: 0 to 95% (non-condensing)

Product Numbers

K54-220	4-Channel Multidrop Master Unit STAT MUX* (115 VAC, 50/60 Hz).
K54-221	8-Channel Multidrop Master Unit STAT MUX* (115 VAC, 50/60 Hz).
K54-222	16-Channel Multidrop Master Unit STAT MUX* (115 VAC, 50/60 Hz).
K54-230	1-Channel Multidrop Node Unit STAT MUX* (115 VAC, 50/60 Hz).
K54-231	2-Channel Multidrop Node Unit STAT MUX* (115 VAC, 50/60 Hz).

K54-232	4-Channel Multidrop Node Unit STAT MUX* (115 VAC, 50/60 Hz).
K54-233	8-Channel Multidrop Node Unit STAT MUX* (115 VAC, 50/60 Hz).

* Includes 4800-baud built-in modem.

Note: All units are available configured for 230 VAC, 50/60 Hz, by special quote.

Related Products

K54-240	Convenience Panel to STAT MUX, 25' cable assembly
K54-250	Same as K54-250 except, 50'
K54-251	Same as K54-250 except, 100'
K54-252	Same as K54-250 except, 150'
K54-253	Same as K54-250 except, 200'

K54-260	MUX to printer (K52-100/101 and K52-110/111), 100' cable assembly
K54-261	Same as K54-260 except, 100'
K54-262	Same as K54-260 except, 150'
K54-263	Same as K54-260 except, 200'

Related Documentation

91-363	Statistical Multiplexor Diagnostic Manual

Worldwide Sales Offices

U.S.A Offices
ALABAMA: Huntsville; ARIZONA: Phoenix; CALIFORNIA: Los Angeles, San Diego, San Francisco, Santa Clara, Tustin; COLORADO: Denver; CONNECTICUT: Fairfield, Hartford; FLORIDA: Orlando; GEORGIA: Atlanta; ILLINOIS: Chicago, Springfield; MARYLAND: Rockville; MASSACHUSETTS: Boston; MICHIGAN: Detroit; MISSOURI: St. Louis; NEW JERSEY: Cherry Hill, West Long Branch; NEW MEXICO: Albuquerque; NEW YORK: Binghamton, Lake Success, New York City, Rochester; NORTH CAROLINA: Raleigh; OHIO: Cleveland, Dayton; OKLAHOMA: Tulsa; PENNSYLVANIA: Pittsburgh; TEXAS: Dallas, Houston; VIRGINIA: Richmond; WASHINGTON: Seattle.

Major Subsidiaries
AUSTRALIA: Brisbane, Canberra, Melbourne, North Ryde, North Sydney, Perth, and NEW ZEALAND: Auckland, Wellington; BELGIUM: Brussels; CANADA: Calgary, Montreal, Ottawa, Toronto, Vancouver; FRANCE: Bois d'Arcy Cedex, Bordeaux, Grenoble, Lille, Lyon, Toulouse; GERMANY: Dusseldorf, Frankfurt, Munich, Stuttgart, Uberlingen, and AUSTRIA: Vienna; GREECE: Athens; HONG KONG: ITALY: Milan; NETHERLANDS: Gouda; THE REPUBLIC OF SINGAPORE; Singapore; SPAIN: Madrid; UNITED KINGDOM: Manchester, Slough. Other countries are served by a network of distributors.

The information contained herein is intended to be a general description and is subject to change with product enhancement.

PERKIN-ELMER

Data Systems Group
2 Crescent Place
Oceanport, N.J. 07757
(201) 870-4712
(800) 631-2154 (U.S.A. Only)

EVERYWARE™