

## EdgeLink® Mini-Mux™ 2000

Drop up to 28 T1s and four Ethernet circuits from a DS3 network



The Edgelink Mini-Mux 2000 combines the functionality of a DS3 Add/Drop Multiplexer (ADM) with Ethernet. Using the latest in Ethernet over PDH (EoPDH) technology, the Mini-Mux 2000 from Telco Systems maps Ethernet into DS3 or DS1 facilities, allowing operators to fully leverage existing networks.

Its compact one rack unit size (1RU), front access for all connections, and temperature hardened design enables deployment in any location. With support for Point-to-Point, Linear Add/Drop, or Ring Add/Drop topologies, the Mini-Mux 2000 is the industry's most flexible DS3 ADM.

The Mini-Mux 2000 cost effectively bridges the gap between Ethernet delivery and existing TDM networks, reducing backhaul costs for cell sites while solving increased bandwidth requirements.

The linear Add/Drop Mux mode of operation and grooming capabilities make the Mini-Mux 2000 the perfect fit for deployment in conjunction with microwave radios. Operators can simplify maintenance and minimize points of failure by replacing back-to-back M13s installed in LADM applications. By using the NxT1 mode, Ethernet can be

bridged across N discrete T1 facilities. Bandwidth can be increased from a single T1 up to 28 T1s through software provisioning.

### Blended Mux Solutions

When deployed in conjunction with the Telco Systems' EdgeLink EXchange Mux® II, the Mini-Mux 2000 yields a platform to deliver T1 and Ethernet circuits from OC-3 rings. Another option is to configure the Mini-Mux 2000 for Ethernet into NxT1 mode and deploy with the Telco Systems EdgeLink Mini-Mux™ 840 to map Ethernet into OC-3 networks.

### Carrier Class Protection

The Mini-Mux 2000 is a fully redundant, carrier class network element that supports SONET-like protection switching for ring and terminal deployments. Dual power feeds and redundant plug-in modules enable true redundancy for all DS1, DS3, and Ethernet circuits.

Extensive monitoring, provisioning, alarm and diagnostic capabilities are standard on the Mini-Mux 2000 contributing to the carrier class architecture. The Mini-Mux 2000 is NEBS Level 3 certified and UL/C-UL listed.

- Combine up to 28 DS1s and four 10/100Mbps into a DS3
- Ethernet deliver over PDH (DS3 or DS1)
- Flexible configurations - LADM (Drop and Add)
- Drop and Add, Ring ADM, Point-to-Point
- Easy to use Management - Web, Telnet, SNMP, Craft
- Extensive provisioning, alarm and diagnostic capabilities
- 1RU, temperature hardened design
- 3/1 grooming capabilities
- Front access for all connections (power, alarm and interface)
- Embedded DS3 management channel for managing remote nodes
- NEBS Level 3 certified

#### Point-to-Point



#### Linear ADM



#### Ring ADM



# EdgeLink Mini-Mux 2000

DS3 Multiplexer

## Configurations and Modes of Operation

|                                 | DS3 ADM Module             |                                    | DS3 EADM Module                       |  |
|---------------------------------|----------------------------|------------------------------------|---------------------------------------|--|
|                                 | DS3 ADM with T1 Drops Only | DS3 ADM with T1 and Ethernet Drops | DS3 Terminal with Ethernet Drops Only | NxT1 Terminal with T1 and Ethernet Drops |
| <b>DS3 Line Facilities</b>      | 2                          | 1 (Terminal) or 2 (ADM)            | 1                                     | 0  |
| <b>T1 Line Facilities</b>       | 0                          | 0                                  | 0                                     | Up to 28                                 |
| <b>T1 Drop Ports</b>            | 28                         | Up to 28                           | 0                                     | Up to 14                                 |
| <b>Ethernet Drop Ports</b>      | 0                          | 4                                  | 4                                     | 4  |
| <b>T1s to bond for Ethernet</b> | 0                          | Up to 28 (16 per VCG)              | Up to 28 (16 per VCG)                 | Up to 28 (16 per VCG)                    |

### Specifications

#### Interfaces

##### T3 Interface

- Line Rate: 44.736 Mbps ± 20 ppm
- Line Code: Bipolar B3ZS encoded
- Framing: C-Bit Parity or M13
- Line Build-Out: 0-900 feet
- Input Level: 35MV to 900 MV
- Clocking: Loop or internal
- Line Interface: 75 ohm Mini BNC coax

##### T1 Interface

- Line Rate: TX: 1.554 Mbps ± 50 ppm  
RX: 1.554 Mbps ± 130 ppm
- Line Code: AML or B8ZS
- Framing: SF (D4), ESF, or Unframed
- Line Build-Out: 0-655 feet
- Line Interface: Dual 64-pin Champ connectors

##### 10/100 BASE-T Ethernet Interface

- IEEE 802.3
- 4 RJ45 Connectors
- GFP
- LO VCAT (Up to 16 VCG)
- LCAS for bandwidth management
- Up to 16 VLANs
- Pause and jumbo frames

### General Specifications

#### System Management

- VT100 terminal
- Telnet
- SNMP
- Web Browse Performance Monitoring
- Cumulative Errored Seconds
- Cumulative Severely Errored Seconds
- T1 BPV
- T3 P-bit errors
- T3 CP-bit errors (C-bit parity mode)
- FEBE errors (C-bit parity mode)
- Tx/Rx bytes
- Tx/Rx frames
- Tx/Rx frames dropped

#### Alarms

- External contacts for visual and audible alarms
- Major and minor alarms
- Normally open and normally closed pin-out
- T3 Alarms: LOS, AIS, OOF, X-BIT
- T1 Alarms: LOS, AIS
- Ethernet Alarms: Link  
CAT, VCG and GFP status

### Timing

- T3 loop, internal, or external timing

### Testability

- T3 Loopbacks (toward drop and line)
- T1 Loopbacks (toward drop and line)
- Remote C-bit loopback (generate and receive)
- Manual and automatic protection switching for high and low speed ports
- T1 Test Patterns (Tx and Rx)

### Standards and Compliance

- UL/C-UL
- NEBS Level 3
- FCC Part 15 Class A

### Mechanical

- 19" Shelf: 1.75" H x 17.37" W x 10.03" D
- Weight: Maximum of 10 lbs (fully loaded)
- Mounting Ears: Reversible for 19" or 23" racks

### Environmental

- Operating temperature of -40°C to 65°C
- Relative humidity to 95% (non condensing)

### Power

- Separate A & B feeds
- 48VDC or +24VDC, 30 Watts maximum

### Ordering Information

| Part Number   | Description  |
|---------------|--|
| 700-00061-001 | Chassis, MPU, and 2 DS3EADM - 1 Working, 1 Protect, -48V |
| 700-00061-002 | Chassis, MPU, and 2 DS3ADM - 1 Working, 1 Protect, -48V  |
| 700-00061-003 | Chassis, MPU, and 1 DS3EADM - 1 Working, 0 Protect, -48V |
| 700-00061-004 | Chassis, MPU, and 1 DS3ADM - 1 Working, 0 Protect, -48V  |
| 700-00061-005 | Chassis, MPU, and 2 DS3EADM - 1 Working, 1 Protect, +24V |
| 700-00061-006 | Chassis, MPU, and 2 DS3ADM - 1 Working, 1 Protect, +24V  |
| 700-00061-007 | Chassis, MPU, and 1 DS3EADM - 1 Working, 0 Protect, +24V |
| 700-00061-008 | Chassis, MPU, and 1 DS3ADM - 1 Working, 0 Protect, +24V  |

### Key Applications

- Provision Ethernet and T1 services over PDH (DS3 or DS1) infrastructure
- Wireless Backhaul of T1 and Ethernet
- Microwave radio transport systems
- Replace back-to-back M13 multiplexers
- Point-to-point, Ring Add/Drop, Linear Add/Drop, or Terminal Multiplexer configurations
- Configurable for 10/100Mbps over NxT1 facilities



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