

# FOMi-E3, FOMi-T3

## E3, T3 and HSSI Manageable Fiber Optic Modems



### FEATURES

- Fiber optic modems, extending the range of E3, T3 or HSSI services over fiber optic cables for up to 110 km (68 miles)
- Transparent to E3, T3 and HSSI framing
- Support a wide range of fiber optic interfaces, including long-haul and WDM options
- Fiber optic redundancy for better service availability
- Operate opposite Optimux-XLE1, Optimux-XLE1/16 and Optimux-T3 multiplexers (data only)
- Managed by an ASCII terminal or an SNMP management station
- Support different clock modes, including a station clock
- Relay minor and major alarms
- Include redundant power supplies
- Available as single modem cards for LRS-24, modem rack with SNMP management (except for HSSI option)

### DESCRIPTION

- FOMi-E3 and FOMi-T3 are intelligent fiber optic modems designed for the transparent transmission of E3, T3 or HSSI signals over multimode and single mode fiber optic cables.
- FOMi-E3 and FOMi-T3 operate with a wide range of fiber optic interfaces over multimode and single mode fiber optic cables (see *Table 1*).
- The modems with E3 or T3 electrical interfaces are available with a station clock module that allows them to be synchronized with a central system clock. The station clock E1 and T1 inputs are 2.048 Mbps and 1.544 Mbps, respectively.
- FOMi-E3 and FOMi-T3 operation complies with ITU-T G.703, G.921 and G.956 requirements.

# FOMi-E3, FOMi-T3

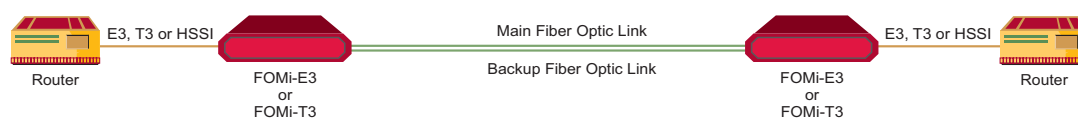
## E3, T3 and HSSI Manageable Fiber Optic Modems

- Four models are available:
  - FOMi-E3 with E3 interface that operates with 34.368 Mbps internal clock and utilizes HDB3 coding
  - FOMi-T3 with T3 interface that operates with 44.736 Mbps internal clock and utilizes B3ZS coding
  - FOMi-E3/HSSI uses the E3 internal clock and operates at 34.368, 17.184, 8.592 Mbps data rates
  - FOMi-T3/HSSI uses T3 internal clock and operates at 44.736, 22.368, 11.184 Mbps data rates.
- FOMi-E3/HSSI and FOMi-T3/HSSI contain an HSSI interface card that acts as an ECL/TTL transceiver and as a DCE interface. These modems do not support the station clock option.
- The modems support a wide range of optical interfaces that operate at various wavelengths over single mode and multimode cables. They also support a variety of physical connectors (ST, FC/PC and SC), as detailed in *Table 1*.
- A dual fiber optic interface allows full redundancy on the fiber optic transmission. A switchover mechanism is activated immediately upon detection of low optical levels on one of the dual optical links.
- FOMi-E3 operates opposite TDM multiplexers: Optimux-XLE1 or Optimux XLE1/16 which multiplex a combination of E1 and Ethernet ports or up to 16 E1s into a single fiber optic link (see *Figure 2*).
- FOMi-T3 operates opposite Optimux-T3 which integrates up to 28 T1, 21 E1, or any combination of T1 and E1 channels, over a single 45 Mbps data stream.
- Remote FOMi-E3 and FOMi-T3 modems can be managed using an inband channel over the fiber link. The management channel operation does not interfere with the data transmission.
- Available also as single modem cards for LRS-24, 19-inch SNMP-managed modem rack. LRS-24 accommodates up to ten modem cards without redundant fiber link. If the modems have a redundant fiber optic link, the maximum number of cards is seven.
- The modem cards and attached remote FOMi-E3 and FOMi-T3 units can be managed via RADview, SNMP network management system. The standalone units are also managed via an ASCII terminal.

**Table 1. FOMi-E3, FOMi-T3 Fiber Optic Interface Characteristics**

Wavelength	Fiber Type	Transmitter Type	Power	Receiver Sensitivity	Connector Type	Typical Max. Range	
[nm]	[μm]		[dBm]	[dBm]		[km]	[miles]
850	62.5/125, multimode	LED	-18	-26	ST	2.5	1.5
1310	62.5/125, multimode	LED	-18	-31	SC, ST	5.5	3.4
1310	9/125, single mode	Laser	-12	-31	SC, ST, FC	38.0	23.6
1310	9/125, single mode	Laser (long haul)	-2	-34	SC, ST, FC	65.0	40.3
1550	9/125, single mode	Laser	-12	-31	ST, FC	25.0	15.5
1550	9/125, single mode	Laser (long haul)	-1	-34	SC, ST, FC	110.0	68.0
1310/1550	9/125, single mode	Laser (WDM)	-12	-29	ST, FC	40.0	25.0

## APPLICATIONS



**Figure 1. Point-to-Point Application**

# FOMi-E3, FOMi-T3

## E3, T3 and HSSI Manageable Fiber Optic Modems

### SPECIFICATIONS

#### DTE INTERFACE

- **Data Rate**
  - E3: 34.368 Mbps
  - T3: 44.736 Mbps
  - HSSI-E3: 8.592, 17.184 or 34.368 Mbps
  - HSSI-T3: 11.184, 22.368 or 44.736 Mbps
- **Line Code**  
E3: HDB3  
T3: B3ZS
- **Impedance**  
E3/T3: 75Ω, unbalanced  
HSSI: 110Ω
- **Range**  
E3/T3: According to ITU-T Rec. G.703  
HSSI: 2m (6.5 feet), nominal
- **Connectors**  
E3/T3: Two shielded BNC connectors (unbalanced)  
HSSI: One SCSI-50

#### FIBER OPTIC INTERFACE

- **Applicable Standard**  
ITU-T Rec. G.956
- **Line Code**  
CDP
- **Specifications and Ranges**  
See Table 1
- **Redundancy**  
Additional link is optional

#### STATION CLOCK

- **Input Data Rate**  
E1: 2.048 Mbps  
T1: 1.544 Mbps
- **Line Code**  
AMI or Square
- **Impedance**  
75Ω, unbalanced
- **Connectors**  
Two shielded BNC

#### GENERAL

- **Diagnostics**  
Loopbacks:
  - Local analog (LLB)
  - Remote digital (RLB)
  - Local digital loopback (DIG)
  - Dual LLB+DIG (DLB)
  - Router loopback (LC), for units with HSSI interface onlyStatistics collection:
  - BPV (electrical), LCE (fiber optic), PSES (electrical and fiber optic), UAS (electrical and fiber optic)
- **Control Port**  
V.24 (RS-232) DTE, operating at 9.6 kbps to 115.2 kbps,
- **Control Port Connector**  
D-type, 9-pin, female
- **Alarm Relay Port**  
Dry contact via 9-pin, D-type, female connector.  
Operates as Normally Open and Normally Closed, using different pins.

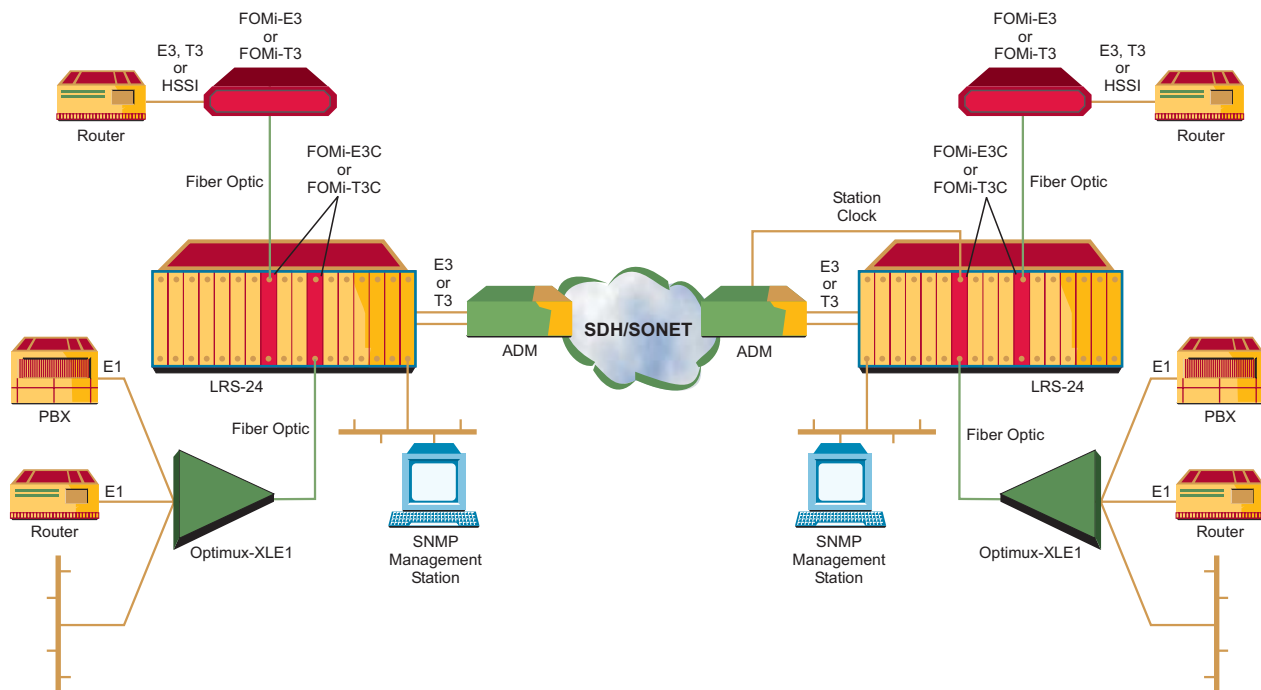


Figure 2. FOMi-E3 or FOMi-T3 Working Opposite Optimux Multiplexers

# FOMi-E3, FOMi-T3

## E3, T3 and HSSI Manageable Fiber Optic Modems

- **Indicators**

- PWR A, PWR B (green/red) – Power supply A/B status
- ELECTRICAL LOS (red) – Loss of signal on E3, T3, or HSSI interface
- ELECTRICAL AIS (yellow) – Unframed alarm indication signal is received by the E3 or T3 interface
- OPTICAL-1/2 LOW (red) – Loss of signal on optical link 1/2
- OPTICAL-1/2 AIS (yellow) – Unframed alarm indication signal is received by optical link 1/2
- TST (red) – A test is active
- ERR (red) – Alarm is present, or fiber optic, electrical or station clock card is missing
- OPTICAL-1/2 SIG (green) – Signal is detected on fiber optic link 1/2
- STATION CLOCK SIG (green) – Input signal is detected on station clock interface
- ELECTRICAL SIG (green) – Signal is detected on E3 or T3 interface

- **Power**

- AC: 100 to 240 VAC (±10%), 47 to 63 Hz
- DC: 24 VDC (±10%) or -48 VDC (±10%)

- **Number of Power Supplies**

- One or two (power sharing)

- **Power Consumption**

- 15W maximum (for one or two power supplies)

- **Physical**

- Height: 44.0 mm / 1.7 in
- Width: 426.8mm / 16.8 in
- Depth: 258.0mm / 10.5 in
- Weight 2.5 kg / 5.5 lb

- **Environment**

- Temperature: 0–50°C/32–122°F
- Humidity: Up to 90%, non-condensing

## ORDERING

### FOMi-E3\*/#/\$/^

E3 and HSSI manageable fiber optic modem

### FOMi-T3\*/#/\$/^

T3 and HSSI manageable fiber optic modem

### FOMi-E3CF/#/\$/&

E3 manageable fiber optic modem card for LRS-24 ETSI version

### FOMi-E3CB/#/\$/&

E3 manageable fiber optic modem card for LRS-24 ANSI version

### FOMi-T3CF/#/\$/&

T3 manageable fiber optic modem card for LRS-24 ETSI version

### FOMi-T3CB/#/\$/&

T3 manageable fiber optic modem card for LRS-24 ANSI version

- \* Specify power supply:

- AC** for 110–230 VAC
- ACR** for redundant 110–230 VAC
- 24** for 24 VDC
- 24R** for redundant 24 VDC
- 48** for -48 VDC
- 48R** for redundant -48 VDC

- # Specify fiber optic interface type

- (# for connector type, followed by & for optical wavelength):
- ST** for ST type connector
- SC** for SC type connector
- FC** for FC/PC type connector

- & **85** for 850 nm, multimode, VCSEL

- 13MM** for 1310 nm, multimode, LED
- 13L** for 1310 nm, single mode, laser diode
- 13LH** for 1310 nm, single mode, long haul laser diode
- 15L** for 1550 nm, single mode, laser diode
- 15LH** for 1550 nm, single mode, long haul laser diode
- SF1** for 1310 nm transmit and 1550 nm receive
- SF2** for 1550 nm transmit and 1310 nm receive

- \$ Specify **R** for redundant fiber optic link (see # and &, above, for options)

- ^ Specify station clock or HSSI: **STC** for station clock

- (not available for units with HSSI interface)

- HSSI** for HSSI (standalone units only)

**Note:** For single fiber connection (WDM) one of the devices must be ordered with an SF1 interface and the other with an SF2 interface.

AIRLINX Communications, Inc.  
Box 253  
Greenville, NH 03048  
E-mail: sales@airlinx.com  
Tel: (888) 224-6814  
Fax: (603) 878-0530