FOM-E3/ETH, FOM-T3/ETH

10/100BaseT over E3/T3 Fiber Optic Modems

- Front panel LEDs indicate system faults in the electrical and fiber optic circuits.
- The alarm relay port transmits the following alarm conditions:
  - Major alarm – High bit error rate at the fiber optic interface.
  - Minor alarm – AIS received at the fiber optic interface.

FEATURES

- High-speed fiber optic modems. Extend the range of 10/100BaseT signals over E3/T3 services via fiber optic cables up to 110 km (68.35 miles)
- Built-in bridge and VLAN support for operation at Ethernet and Fast Ethernet rates
- User-selectable multicast and broadcast prevention to WAN
- Plug-and-play LAN connection
- Single mode, multimode, and WDM over single fiber options
- Relay of minor and major alarm conditions
- Works opposite FOM-E3, FOM-T3, FOM-E3/ETH, or FOM-T3/ETH

DESCRIPTION

- FOM-E3/ETH and FOM-T3/ETH fiber optic modems convert a 10/100BaseT electrical signal into an E3/T3 optical signal. After the conversion, the signal is transmitted over fiber optic cable, extending the 10/100BaseT traffic range up to 110 km (68 miles).
- FOM-E3/ETH and FOM-T3/ETH transparently connect 10/100BaseT links, utilizing the full E3/T3 bandwidth without heavy overhead associated with packet or cell-based technologies.
- The Ethernet interface module performs frame filtering and forwarding at the Fast Ethernet maximum theoretical rate of 150,000 packets per second. The bridge causes no LAN delays.
- FOM-E3/ETH and FOM-T3/ETH support various optical interfaces:
  - 850 nm LED/VCSEL for multimode fiber
  - 1310 nm for single or multimode fiber
  - 1310 nm and 1550 nm laser diode, long haul laser for extended range over single mode fiber
  - WDM laser for transmission over a single fiber.

SPECIFICATIONS

ETHERNET INTERFACE

- **LAN Table**
  1,000 MAC addresses with 5-minute automatic aging
- **Filtering and Forwarding**
  Up to 150,000 packets per second
- **Buffer**
  170 frames with 1 frame delay
- **Standard**
  10/100BaseT IEEE 802.3/ Ethernet V.2, IEEE 802.1/Q
- **Line Code**
  - Manchester (10BaseT)
  - MLT3 (100BaseT)
- **WAN Protocol**
  Point-to-point
- **Transmission Line**
  4-wire, category 5 UTP, 19 AWG to 26 AWG
- **Connector**
  RJ-45

E3/T3 FIBER OPTIC INTERFACE

- **Line Code**
  CDP
- **Interface Characteristics**
  See *Table 1*
- **Connectors**
  ST, SC, or FC (see *Ordering*)

FOM-E3/ETH, FOM-T3/ETH

10/100BaseT over E3/T3 Fiber Optic Modems

GENERAL

- **Timing**
  Internal: provided by onboard crystal oscillator (±25 ppm)
- **Indicators**
  PWR (green) – Unit is powered up
  OPTICAL AIS (yellow) –"All 1s" string is received at fiber optic interface
  OPTICAL ERR (red) – Bit error rate is 10^{-6} or worse
  ETH LINK (green) – LAN is connected to the Ethernet interface
  ETH ACT (yellow) – LAN is receiving/transmitting data
  ETH 100 (green)– LAN is operating at 100 Mbps
- **Alarm Relay Port**
  Dry contact via 9-pin, D-type, female connector. Operates as normally open and normally closed, using different pins
- **Power**
  AC: 100 to 240 VAC, 50 or 60 Hz, 20 VA
  DC: 20 to 72 VDC, 10W
- **Physical**

Height:	4.4	cm	/ 1.7	in
Width:	19.4	cm	/ 7.6	in
Depth:	24.3	cm	/ 9.6	in
Weight	1.4	kg	/ 3.0	lb

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

Table 1. FOM-E3/ETH and FOM-T3/ETH Fiber Optic Interface Characteristics

Wavelength [nm]	Fiber Type [µm]	Transmitter Type	Power [dBm]	Receiver Sensitivity* [dBm]	Typical Max. Range** [km	mi]
850	62.5/125 multimode	VCSEL	-15	-34	4.5	2.8
1310	62.5/125 multimode	LED	-18	-31	5.5	3.4
1310	9/125 single mode	Laser	-12	-31	38	23.6
1310	9/125 single mode	Laser (long haul)	-2	-34	70	43.4
1550	9/125 single mode	Laser	-12	-31	68	42.2
1550	9/125 single mode	Laser (long haul)	-1	-34	110	68.3
1310/1550	9/125 single mode	Laser (WDM)	-12	-30	40	24.9
1310/1310	9/125 single mode	Laser (WDM)	-12	-27	24	14.9

* *Receiver sensitivity is calculated for BER = 10E-9.*
***Range is calculated according to the following typical attenuation rates: 3.5 dB/km for 850 nm multimode, 0.5 dB/km for 1300 nm single mode, 0.25 dB/km for 1550 nm single mode. The maximum range assumes a margin of 3 dB.*

ORDERING

FOM-E3/ETH/ab/q
10/100BT over E3 fiber optic modem

FOM-T3/ETH/ab/q
10/100BT over T3 fiber optic modem

a Specify fiber optic interface type
ST for ST type connector
SC for SC type connector
FC for FC type connector

b **85** for 850 nm, multimode VCSEL
13MM for 1310 nm, multimode
13L for 1310 nm, single mode, laser
15L for 1550 nm, single mode, laser
13LH for 1310 nm, single mode, long haul laser
15LH for 1550 nm, single mode, long haul laser
SF1 for transmit 1310 nm, receive 1550 nm, WDM laser
SF2 for transmit 1550 nm, receive 1310 nm, WDM laser
SF3 for transmit/receive 1310 nm, WDM laser

q Specify power supply:
AC for 100 to 240 VAC
DC for 20 to 72 VDC

APPLICATION

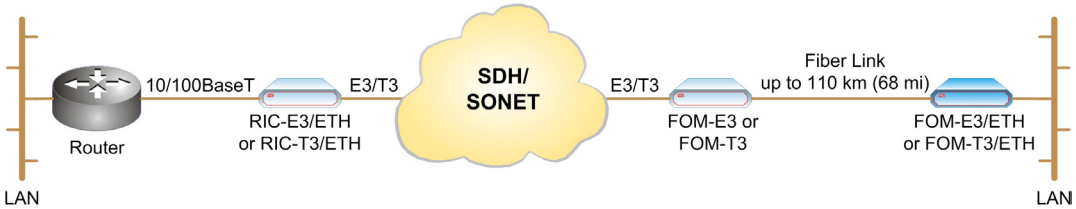

Figure 1. Ethernet Traffic over Fiber Optic Link with E3/T3 Access to SDH/SONET

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