

FOM-E3/ETH, FOM-T3/ETH

10/100BaseT over E3/T3 Fiber Optic Modems



Convert 10/100BaseT electrical signals into optical signals, extending the traffic range up to 110 km (68.3 miles)

- High-speed fiber optic modems
- Built-in bridge and VLAN support
- User-selectable multicast and broadcast prevention to WAN
- Plug-and-play LAN connection
- Operate over single mode, multimode and WDM fibers



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10/100BaseT over E3/T3 Fiber Optic Modems

The FOM-E3/ETH and FOM-T3/ETH fiber optic modems convert a 10/100BaseT electrical signal into optical signals for transmission over fiber optic cable to extend the 10/100BaseT traffic range to up to 110 km (68.3 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 VCSEL for multimode fiber
- 1310 nm laser for single-mode or multimode fiber
- 1310 nm and 1550 nm long-haul lasers for extended range over single-mode fiber
- WDM laser for transmission over a single fiber.

The modems are compatible with RAD's DXC, Optimux-34, Optimux-45, FOM-E3 and FOM-T3 devices.

Front panel LEDs indicate system faults in the electrical and fiber optic circuits.

An alarm relay port transmits the following alarm conditions:

- Minor alarm–AIS received at the electrical or fiber optic interface
- Major alarm– High bit error rate at the fiber optic interface.



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

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, SC-APC or FC

GENERAL

Timing

Internal: provided by onboard crystal oscillator (± 25 ppm)

Alarm Relay Port

Dry contact via 9-pin, D-type, female connector. Operates as normally open and normally closed, using different pins

Indicators

PWR (green): Power status

OPTICAL AIS (yellow): FO AIS status

OPTICAL ERR (red): FO bit error status

ETH LINK (green): LAN- Ethernet connection is active

ETH ACT (yellow): LAN is receiving-transmitting data

ETH 100 (green): LAN is operating at 100 Mps

TEST LOC (yellow): Local loopback is active

TEST REM (yellow): Remote loopback is active

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)

Power

AC: 100–240 VAC, 50–60 Hz

DC: 20–72 VDC, 10W

Environment

Temperature: 0°–50°C (32°–122°F)

Humidity: Up to 90%, non-condensing

Table 1. Fiber Optic Interface Characteristics

Wavelength	Fiber Type	Transmitter Type	Power	Receiver Sensitivity*	Typical Max. Range**	
[nm]	[μ m]		[dBm]	[dBm]	[km]	[miles]
850	62.5/125 multimode	VCSEL	-15	-31	4.5	2.8
1310	62.5/125 multimode	Laser	-9	-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), SF1, SF2	-12	-30	40	24.9
1310	9/125 single mode	Laser (WDM), SF3	-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 multi mode, 0.5 dB/km for 1300 nm single mode, 0.25 dB/km for 1550 nm single mode. The max. range assumes a margin of 3 dB.

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Ordering

FOM-E3/ETH/~ab

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Legend

~ Power supply type:

AC 100 to 240 VAC

48 -20 to -72 VDC

a Connector type:

ST ST connector

SC SC connector

FC FC connector

SC-APC SC-APC connector

Note: SC-APC connector can only be ordered with SF3 transmitter

b Optical wavelength and transmitter:

85 850 nm, multimode, VCSEL

13MM 1310 nm, multimode, laser

13L 1310 nm, single mode, laser

15L 1550 nm, single mode, laser

13LH 1310 nm, single mode,

long-haul laser

15LH 1550 nm, single mode,

long-haul laser

SF1 Tx 1310 nm, Rx 1550 nm,

WDM laser

SF2 Tx 1550 nm, Rx 1310 nm,

WDM laser

SF3 Tx/Rx 1310 nm, WDM laser

Note: SF1 and SF2 transmitters can only be ordered with SC connector and SF3 transmitter can only be ordered with SC-APC connector

SUPPLIED ACCESSORIES

AC power cord

DC connection kit (when DC power supply is ordered)

OPTIONAL ACCESSORIES

RM-9

Hardware kit for mounting one or two FOM-E3/ETH or FOM-T3/ETH units in a 19-inch rack

Table 2. Fiber Optic Modem Comparison Chart

Feature	FOM-E1/T1	FOMi-E1/T1	FOM-20	FOM-40	FOMi-40	FOM-E3 FOM-T3	FOMi-E3 FOMi-T3	FOM-E3 ETH FOM-T3 ETH
Data rates [kbps]	E1/T1	E1/T1	19.2-256	56-2048	56-2048	E3 T3	E3 T3	E3 T3
DTE interfaces	G.703	G.703	Serial, Ethernet	Serial, Ethernet	Serial, Ethernet, E1/T1	G.703	G.703, HSSI	10/100BaseT VLAN bridge
SNMP management	-	✓	-	-	✓	-	✓	-
Card version for rack	ASM-MN-214	LRS-24	ASM-MN-214	ASM-MN-214	LRS-24	-	LRS-24	-

International Headquarters
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

North America Headquarters
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@radusa.com

www.rad.com



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