

# FOM-E1/T1

E1/T1 Fiber Optic Modem



Converts E1/T1 electrical signals into optical signals to extend the range of E1/T1 service up to 144 km (89.4 miles)

- Extended range with optional laser diode
- Transparent to E1/T1 framing
- Compatible with RAD's DXC cross-connect systems, FCD access units, and Megaplex access multiplexers
- ITU standards compliant

The FOM-E1/T1 fiber optic modem converts E1/T1 electrical signals into optical signals for transmission over fiber optic cables to extend the E1/T1 service range of up to 144 km (89.4 miles).

FOM-E1/T1 features various optical interfaces:

- 850 nm for multimode fiber
- 1310 nm for multimode fiber
- 1310 nm for single-mode fiber
- 1550 nm for extended range over single-mode fiber.



**data communications**

The Access Company

# FOM-E1/T1

## E1/T1 Fiber Optic Modem

FOM-E1/T1 operation complies with ITU G.703 and G.955 standards.

An alarm relay port transmits the following alarm conditions:

- Major alarm – Low level of E1/T1 electrical input or high bit error rate at the fiber optic interface
- Minor alarm – AIS received at electrical or fiber optic interface.

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

The modem features local and remote loopbacks.

FOM-E1/T1 is also available as a plug-in card for RAD's 19-inch modem rack, ASM-MN-214.

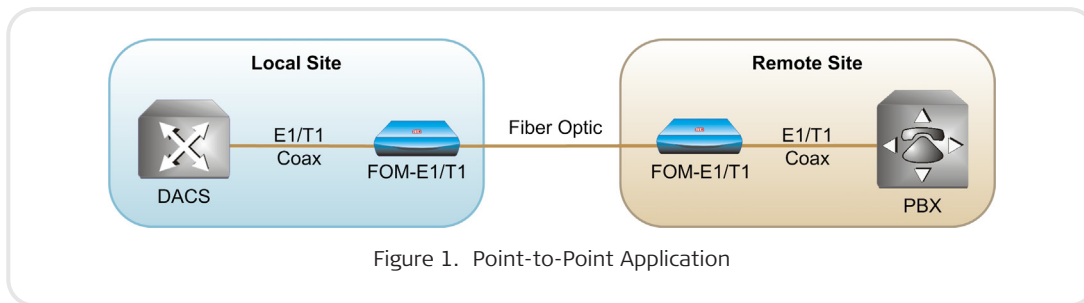


Figure 1. Point-to-Point Application

Table 1. FOM-E1/T1 Fiber Optic Interface Characteristics

Option	Wavelength [nm]	Fiber Type [μm]	Transmitter Type	Typical Power [dBm]	Receiver Sensitivity [dBm]	Connector	Typical Max. Range	
							[km]	[mi]
85	850	62.5/125 multimode	VCSEL/LED VCSEL	-18 (FOM-E1/T1/R) -7 (FOM-E1/T1)	-35 (FOM-E1/T1/R) -32 (FOM-E1/T1)	ST, SC, FC	4.8 6.7	3.0 4.2
13MM	1310*	62.5/125 multimode	LED	-18	-31	ST, SC	9.3	5.7
13L	1310	9/125 single mode	Laser	-12	-40	ST, SC, FC	50.0	31.0
13LH	1310*	9/125 single mode	Laser (long haul)	-2	-40	ST, SC, FC	70.0	43.4
15L	1550	9/125 single mode	Laser	-12	-38	ST, SC, FC	92.0	57.0
15LH	1550*	9/125 single mode	Laser (long haul)	-1	-40	ST, SC, FC	144.0	89.4
SF1	1310/1550*	9/125 single mode	Laser (WDM), SF1	-12	-34	SC	38.0	23.6
SF2	1550/1310*	9/125 single mode	Laser (WDM), SF2	-12	-34	SC	38.0	23.6
SF3	1310*	9/125 single mode	Laser (single fiber), SF3	-12	-27	SC/APC	20.0	12.4

\* Available in standalone version only.

## Specifications

### E1/T1 ELECTRICAL INTERFACE

#### Transmission Rate

E1: 2.048 Mbps  
T1: 1.544 Mbps

#### Zero Suppression

E1: HDB3  
T1: B8ZS, AMI

#### Impedance

E1: 75Ω, unbalanced or  
120Ω, balanced  
T1: 100Ω, balanced

#### E1 Interface Connectors

RJ-45, balanced  
BNC, unbalanced

### FIBER OPTIC INTERFACE

See *Table 1*

### GENERAL

#### Diagnostics

Local and remote loopbacks activated via back panel DIP switch

#### Alarm Relay Port

Dry contact via 9-pin, D-type, female connector

**Note:** *The card version uses the ASM-MN-214 alarm relay port.*

#### Indicators

PWR (green) – power status  
LLB (yellow) – local loopback status  
RLB (yellow) – remote loopback status  
OPTICAL AIS (yellow) – "all 1s" string received at the fiber optic interface  
OPTICAL LOSS (red) – BER is over 10<sup>-6</sup>  
ELEC LOSS (red) – electrical interface input is below G.703 level  
ELEC LOSS (red) – electrical interface input is below G.703 level  
ELEC AIS (yellow) – "all 1s" string received at the electrical interface

#### Power (Standalone only)

Wide range: 100–240 VAC or  
–40 to –60 VDC  
DC only: 24 VDC

#### Power Consumption

AC: 8 VA max  
DC: 4W max

#### Physical

Height: 4.37 cm (1.7 in)  
Width: 24.0 cm (9.4 in)  
Depth: 17.0 cm (6.7 in)  
Weight: 0.5 kg (1.1 lb)

#### Environment

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

Table 2. Fiber Optic Modem Comparison Chart

Feature	FOM-E1/T1	FOMi-E1/T1	FOM-20	FOM-40	FOMi-40	FOM-E3/T3	FOMi-E3/T3	FOM-E3/T3 ETH
Max. Data Rate [kbps]	E1/T1	E1/T1	19.2–256	56–2048	56–2048	E3/T3	E3/T3	E3/T3
Interfaces	G.703	G.703	Serial, Ethernet	Serial, Ethernet	Serial, Ethernet, E1/T1	G.703	G.703, HSSI	10/100BaseT VLAN Bridge
Laser Diode Option	✓	✓	✓	✓	✓	✓	✓	✓
SNMP Management		✓			✓		✓	
Card Version for Rack	ASM-MN-214	LRS-24	ASM-MN-214	ASM-MN-214	LRS-24		LRS-24	

## FOM-E1/T1

## E1/T1 Fiber Optic Modem

## Ordering

## FOM-E1/T1/\*/#/ε

E1/T1 standalone fiber optic modem

## FOM-E1/T1/R/#/ε

E1/T1 fiber optic modem, card version for  
ASM-MN-214 modem rack

## Legend

\* Power supply:

**AC** 100 to 240 VAC

**48V** -40 to -60 VDC

**24V** 24 VDC

# Fiber optic connector:

**ST** ST connector

**SC** SC connector

**FC** FC connector

ε	Optical wavelength, fiber and transmitter (see <i>Table 1</i> )
<b>85</b>	850 nm, multimode, VCSEL
<b>13MM</b>	1310 nm, multimode, LED (standalone only)
<b>13L</b>	1310 nm, single mode, laser diode
<b>13LH</b>	1310 nm, single mode, laser diode, long haul (standalone only)
<b>15L</b>	1550 nm, single mode, laser diode
<b>15LH</b>	1550 nm, single mode, laser diode, long haul (standalone only)
<b>SF1</b>	WDM single fiber, 1310 nm Tx (standalone only)
<b>SF2</b>	WDM single fiber, 1550 nm Tx (standalone only)
<b>SF3</b>	single fiber, 1310 nm Tx/Rx (standalone only)

*Note:* When ordering SFx options, do not specify the fiber optic connector type #.

## OPTIONAL ACCESSORY

## RM-33-2

Hardware for mounting one or two FOM-E1/T1 standalone units in a 19-inch rack

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