

# FOM-40

## Fiber Optic Modem



- FOM-40 operates with several grades and sizes of fiber optic cable. Different optical interfaces are available:
  - 850 nm VSCSEL for use with multimode fibers
  - 1310 nm laser for use with single mode fibers
  - 1550 nm laser for use with single mode fibers for an extended range of up to 100 km (62 miles).
- Three clocking modes are available for maximum flexibility: internal clock, receive loopback clock and external DTE clock.
- Diagnostics include local analog and digital loopbacks, and remote digital loopback. The loopback commands are controlled either by a manual switch, or via the DTE interface signals. A front panel switch generates an internal pseudo-random test pattern (511 bits) according to the ITU V.52 standard, for testing end-to-end connectivity. An ERROR LED flashes whenever a bit error is detected.
- A card version of FOM-40 is available for installation in RAD's ASM-MN-214 rack.

### FEATURES

- Synchronous fiber optic modem with a wide range of selectable data rates: from 56 to 2048 kbps
- Supports various types of single or multimode fiber
- Extended transmission range up to 100 km (62 mi) using 1550 nm laser diode transmitter
- Digital interfaces: V.24/RS-232, V.35, X.21, RS-530, V.36 (RS-449), G.703 codirectional, and built-in 10/100BaseT bridge
- Local and remote digital and local analog loopbacks, and V.52 compliant BER testing
- Optional card version for the ASM-MN-214 rack

### DESCRIPTION

- FOM-40 is a long-range fiber optic modem that transmits data over up to 100 km (62 miles), and is a secure data link between computers, routers, multiplexers, and other data communication devices. It operates at twelve selectable synchronous data rates from 56 kbps to 2048 kbps.
- FOM-40 converts electrical signals from the DTE into optical signals via a laser diode. At the opposite end of the fiber, the optical signals are converted back into electrical signals, in compliance with the appropriate interface.
- The following DTE interfaces are available:
  - V.24/RS-232
  - V.35
  - X.21
  - RS-530
  - V.36 (RS-449)
  - G.703 Codirectional (64 kbps)
  - 10/100BaseT.

# FOM-40

## Fiber Optic Modem

### SPECIFICATIONS

#### DATA PORT

- **Data Rates**  
56, 64, 112, 128, 256, 384, 512, 768, 1024, 1536, 1544, and 2048 kbps
- **DTE Interfaces**
  - V.24/RS-232 via 25-pin D-type, female
  - V.35 via 34-pin D-type, female
  - V.36/RS-449 via 37-pin D-type, male, using an adapter cable
  - RS-530 via 25-pin D-type, female
  - X.21 via 15-pin D-type, female
  - IR-ETH/QV via RJ-45
  - IR-G.703 Codirectional (64 kbps) via 5-clip terminal block or RJ-45

**Note:** For G.703 codirectional interfaces, there is no end-to-end byte synchronization.

- **Receive Timing**  
Derived from the receive signal
- **Transmit Timing**  
Derived from three alternative sources:
  - Internal oscillator
  - External from the DTE
  - Loopback clock (receive clock) recovered from the receive signal, looped back as a transmit clock

#### FIBER OPTIC PORT

- **Fiber Optic Characteristics**  
See *Table 1*
- **Connectors**  
FC, SC, ST

#### DIAGNOSTICS

- **Local Digital Loopback (DIG)**  
Activated by a front-panel switch
- **Local Analog Loopback (ANA)**  
Activated by a front-panel switch or by DTE interface signals (excluding X.21 and G.703)
- **Remote Digital Loopback (REM)**  
Activated by a front-panel switch or by DTE interface signals (V.35 or RS-530 and V.24/RS-232)
- **Pattern (PATT)**  
Activated by a front panel switch, injects and detects an ITU V.52 511 test pattern

### APPLICATION

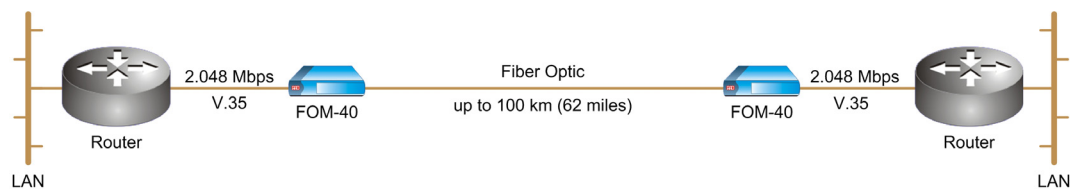


Figure 1. Serial Data Transmission over a Fiber Optic Link

### GENERAL

- **Indicators**

PWR (green) – Power  
 RTS (yellow) – Request to send  
 TD (yellow) – Transmit data  
 RD (yellow) – Receive data  
 DCD (yellow) – Data carrier detect  
 TEST (yellow) – Loopback mode, BER test  
 ERR (red) – BER test error

- **Power**

100 to 240 VAC (±10%),  
 50 to 60 Hz  
 24/-48 VDC (±10%)

- **Power Consumption**

AC: 3 VA max  
 DC: 4W max

- **Physical**

FOM-40 Standalone:  
 Height: 4.0 cm (1.5 in)  
 Width: 19.0 cm (7.4 in)  
 Depth: 16.0 cm (6.2 in)  
 Weight: 0.6 kg (1.3 lb)

FOM-40R Card:  
 Fits the ASM-MN-214 modem rack  
 Weight: 0.1 kg (0.2 lb)

- **Environment**

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

**Table 1. Fiber Optic Characteristics**

Operating Wavelength [nm]	Fiber Type [μm]	Transmitter Type	Typical Output Power [dBm]	Receiver Sensitivity [dBm]	Typical Attenuation [dB/km]	Typical Range [km] [mi]	
850	62.5/125 multimode	VCSEL	-18	-39	3.5	4.5	2.8
1310	9/125 single mode	Laser	-12	-40	0.5	50	31
1550	9/125 single mode	Laser	-12	-40	0.25	100	62



# FOM-40

## Fiber Optic Modem

### ORDERING

**FOM-40/~/#/^**

Fiber optic modem, standalone unit

**FOM-40R/#/^**

Fiber optic modem, card version

~ Specify power supply type:

**AC** for 100–240 VAC

**48** for –48 VDC

**24** for 24 VDC

# Specify optical interface:

**FC85** for 850 nm multimode,  
FC connector

**SC85** for 850 nm multimode,  
SC connector

**ST85** for 850 nm multimode,  
ST connector

**FC13L** for 1310 nm single mode,  
FC connector

**SC13L** for 1310 nm single mode,  
SC connector

**ST13L** for 1310 nm single mode,  
ST connector

**FC15L** for 1550 nm single mode,  
FC connector

**SC15L** for 1550 nm single mode,  
SC connector

**ST15L** for 1550 nm single mode,  
ST connector

^ Specify DTE interface:

**V24** for V.24/RS-232

**V35** for V.35

**530** for RS-530

**X21** for X.21

**V36** for V.36/RS-449

**703/%** for G.703 codirectional  
(64 kbps) (standalone only)

**UTP/QV** for built-in  
Ethernet/802.3 bridge with  
RJ-45 connector

% Specify connector of G.703  
interface (standalone only):

**TB** for terminal block

**RJ** for RJ-45

### SUPPLIED ACCESSORIES

AC power cord (for standalone units  
when AC power supply is ordered)

DC adapter plug (for standalone units  
when DC power supply is ordered)

### **CBL-530/449**

Adapter cable (supplied with V.36  
interface only)

### OPTIONAL ACCESSORIES

#### **RM-29**

Hardware kit for mounting one or  
two FOM-40 standalone units in a  
19-inch rack

#### **CIA/&**

Connector interface adapter for  
FOM-40 (card version only) in an  
ASM-MN-214 rack

& Specify adapter:

**V35/1** for adapting one 25-pin  
rack DTE connector to one V.35  
34-pin connector

**X21/1** for adapting one 25-pin  
rack DTE connector to one X.21  
15-pin connector

**ETH** for adapting one 25-pin rack  
DTE connector to one RJ-45  
connector



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281-100-02/06