

FOM-40

Fiber Optic Modem



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 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.

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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

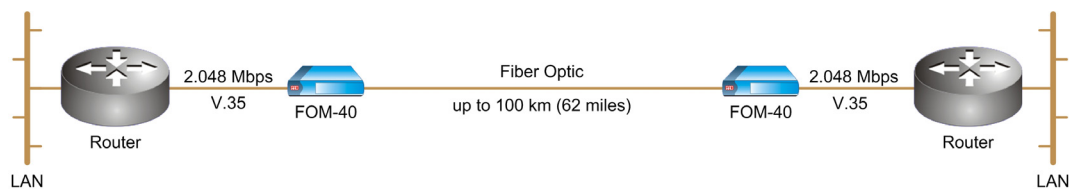


Figure 1. Serial Data Transmission over a Fiber Optic Link

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

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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

RAD

data communications

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