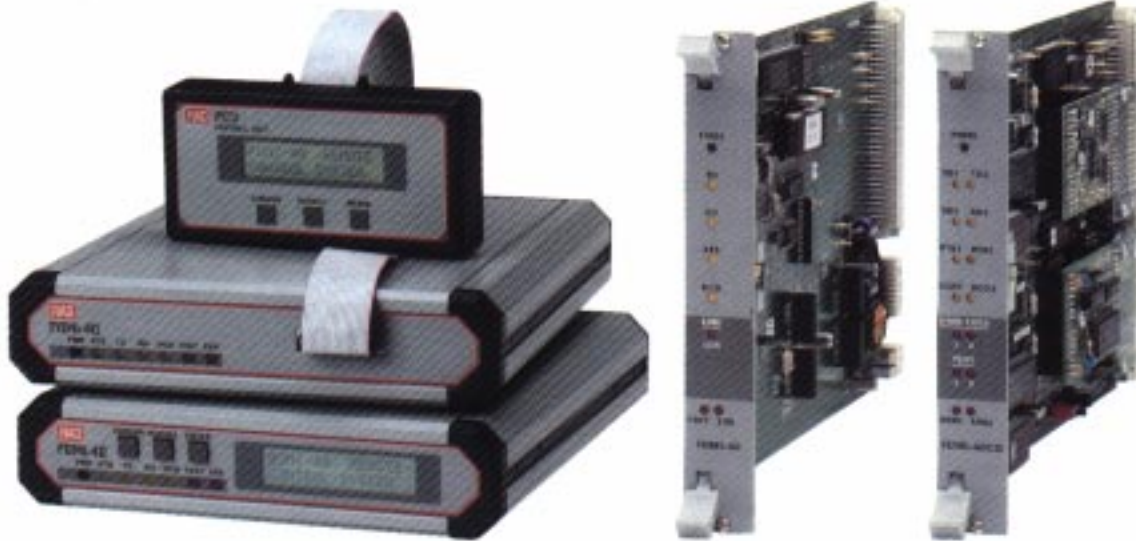


# FOMi-40

*Fiber Optic Modem with Remote Management*



## FEATURES

- Selectable data rates from 56 to 2048 kbps
- Operates over multimode or single mode
- Extended transmission range up to 100 km (62 miles) using 1550 nm laser diode option
- Automatic rate detection in external mode for tail-end applications
- Full management of the local and remote units from the front panel
- Remote in-band management for all conditions
- Real-time alarm indication for local and remote units
- Diagnostic V.54 loops and built-in V.52 BERT
- Card version for LRS-12, or a double modem card for LRS-24, 19" modem rack with SNMP management
- Variety of digital interfaces supported, including:
  - V.24/RS-232 (64 kbps)
  - V.35
  - X.21
  - RS-530
  - V.36/RS-449
  - G.703 Codirectional (64 kbps)
  - G.703 E1
  - G.703 T1
  - Built-in Ethernet bridge

# FOMi-40

## Fiber Optic Modem with Remote Management

### DESCRIPTION

- The FOMi-40, Fiber Optic Modem, provides a long range (up to 100 km / 62 miles), and a secure data link between computers, routers, multiplexers and other data communication devices. It operates at 14 selectable synchronous data rates from 56 kbps to 2048 kbps.
- FOMi-40 converts electrical signals from DTE equipment into optical signals via an infrared light emitting diode or 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.
- Two versions of FOMi-40 are available: Master and Slave. The Master standalone version features a front panel LCD. The Slave unit has a blank front panel with a 20-pin connector. For cases where parameters of the slave, master or system alarms have to be monitored and changed on the slave side, a Portable Control Unit (PCU) can be connected to the 20-pin connector.
- The modem uses an in-band management channel for controlling and monitoring the remote unit. Both data and management are transmitted over the same fiber link, simultaneously, without interference.
- Menu-driven software, available on the front panel, allows the user to soft select the monitoring and adjustment of local and remote units.
- The front panel software menus allow the user to monitor and control the following parameters:
  - Data rate (when set to Internal or Receive mode)
  - Clock source
  - Loop activation
  - Internal BER tester activation
  - LED status of local and remote units
  - Local and remote unit settings
  - Real time alert of fault conditions.
- When set to External mode, FOMi-40 automatically detects the clock rate coming from the digital interface and sets the remote unit to work at the same rate. When the data rate of the external clock is changed, both local and remote units follow the new rate and synchronize accordingly.
- FOMi-40 utilizes a Phase Locked Loop (PLL) circuit to recover jitter-free data and clock from the optical signal.
- FOMi-40 is designed to operate with several grades and sizes of fiber optic cable. Different optical interfaces are available:
  - 850 nm for use with multimode fibers
  - 1300 nm for use with single mode fibers
  - 1300 nm laser for use with single mode fibers
  - 1550 nm laser for use with single mode fibers.
- Immunity is provided against electrical interference such as EMI, RFI, spikes and differential ground loops. Protection is provided against sparking and lightning, and a secure link is maintained in hazardous or hostile environments.

### APPLICATION

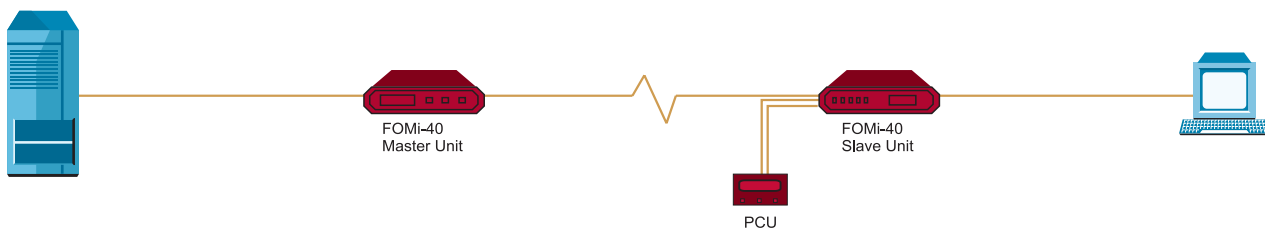


Figure 1. Point-to-Point Application

## Fiber Optic Modem with Remote Management

- Timing is derived from three alternate switch-selectable sources:
  - Internal, from a built-in oscillator
  - External, from the attached DTE
  - Receive, from the received signal.
- FOMi-40C is a card version for LRS-12 and FOMi-40CD is a double modem card for the LRS-24, 19" modem rack with SNMP management, which can accommodate up to 12 or 24 modems. These card versions can be managed in an LRS 12/24 hub from an ASCII terminal or by a RADview. RADview, RAD's SNMP management application running on PC or HPOV UNIX platform.
- The diagnostic facility of the unit includes different loop tests and an internal BER tester. The available loops are:
  - Local analog loopback
  - Local digital loopback
  - Remote loopback
  - Remote analog loopback.
- The loops can be activated from the front panel, the PCU, the central SNMP management or the digital interfaces, which support loop activation signals. An internal BER tester that complies with V.52/511 pattern is also available.
- FOMi-40's field changeable interface includes an optional built-in Ethernet bridge interface. This option can be used for LAN to LAN connectivity over the fiber link, using only a pair of FOMi-40s.
- The FOMi-40 system configuration is stored in non-volatile memory minimizing system downtime when the power is lost or when a faulty unit is replaced.
- The in-band management channel provides real time alerts for:
  - Disconnection of the digital data transmission
  - Disconnection of the management channel
  - Remote modem failure
  - Loop activation.
- Real time indication of system status is provided on the front panel LCD for both the local and the remote modem.

## SPECIFICATIONS

### ELECTRICAL

- **Transmission Rates**  
56, 64, 96, 112, 128, 192, 256, 384, 512, 768, 1024, 1536, 1544 and 2048 kbps
- **Interfaces and Connectors**  
V.24/RS-232 via 25-pin D-type, female  
V.35 via 34-pin D-type, female  
X.21 via 15-pin D-type, female  
RS-530 via 25-pin D-type, female  
V.36/RS-449 via 37-pin D-type, male using an adapter cable  
G.703 Codirectional (64 kbps) via terminal block or RJ-45  
G.703 E1 via RJ-45 and two BNC  
G.703 T1 via RJ-45  
Ethernet via RJ-45 or BNC

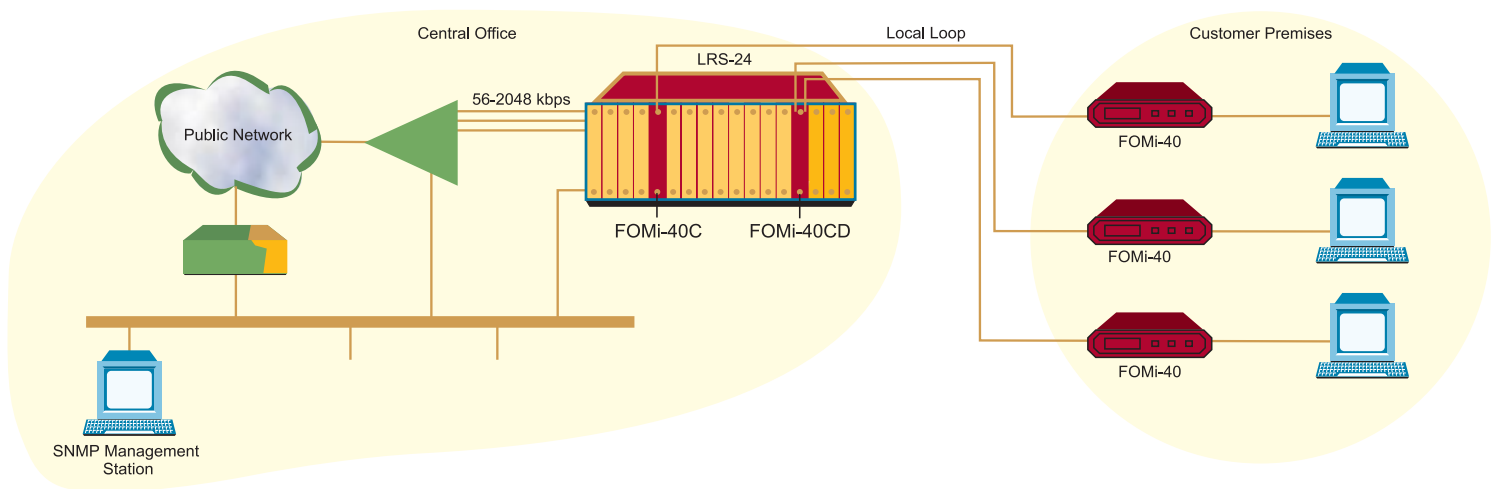


Figure 2. Central Site Application with SNMP Management

# FOMi-40

## Fiber Optic Modem with Remote Management

### OPTICAL

- **Operating Wavelength**  
850 nm for multimode operation  
1300 nm for single mode operation  
1300 nm for the laser diode option  
1550 nm for the laser diode option
- **Transmission Line**  
Dual fiber optic cable
- **Power Ranges**  
Typical output power:  
-18 dBm for 850 nm: 62.5/125  
-18 dBm for 1300 nm: 9/125  
-12 dBm for 1300 nm: laser diode  
-12 dBm for 1550 nm: laser diode  
Receiver sensitivity:  
-38 dBm for 850 nm  
-40 dBm for 1300 nm  
-40 dBm for 1300 nm: laser diode  
-40 dBm for 1550 nm: laser diode  
Dynamic range: 28 dB
- **Fiber Optic Interface**  
Optical connectors:  
SC, ST or FC-PC (see *Ordering*)

### GENERAL

- **Diagnostics**  
Remote (REM):  
Activated by a front panel or by DTE interface signals (V.35 or RS-530 and V.24/RS-232)  
Local Analog Loopback:  
Local (ANA), activated by a front panel or by DTE interface signals (excluding X.21 and G.703)  
Pattern (PATT):  
Front panel: when activated, it generates and detects a pseudo-random BERT 511 data pattern
- **Timing Elements**  
Receive clock:  
Derived from the receive signal  
Transmit clock:  
Derived from the:  
- Internal signal, from a built-in oscillator  
- External signal, from the attached DTE  
- Receive signal, looped back from the received signal

- **Indicators**  
Transmit Data, Receive Data, Request to Send, Data Carrier Detect, Error (ERR), Power, Loopback mode or BER (TEST)
- **Power Supply**  
115 or 230V ( $\pm 10\%$ ), 47-63 Hz  
5 VA or 48 VDC ( $\pm 10\%$ ); or 24 VDC ( $\pm 10\%$ )  
Power consumption for LRS-12 card is 2.4W
- **Physical**  
FOMi-40 Standalone  
Height: 44.0 mm / 1.7 in  
Width: 24.0 cm / 9.6 in  
Depth: 19.3 cm / 7.6 in  
Weight 1.4 kg / 3.1 lb  
PCU (Portable Control Unit)  
Height: 25.0 mm / 0.98 in  
Width: 13.0 cm / 5.12 in  
Depth: 6.5 cm / 2.56 in  
Weight 220g / 0.49 lb
- **Environment**  
Temperature: 0-50°C / 32-122°F  
Humidity: up to 90%, non-condensing

### ORDERING

#### FOMi40\*/@/&/+/\#

Fiber optic modem, standalone unit

#### FOMi40C#/#/&/+

Fiber optic modem card version for the LRS-12 card cage

#### FOMi40CD#/#/&/+

Double modem card version for the LRS-24 card cage

- \* Specify standalone main power supply:  
**115** for 115 VAC  
**230** for 230 VAC  
**48** for -48 VDC  
**24** for 24 VDC

- @ Specify Master or Slave unit:  
**M** for Master unit  
**S** for Slave unit

- # Specify ETSI/ANSI chassis  
**F** for ETSI chassis  
**B** for ANSI chassis

- & Specify optical interface:  
**SC85** for 850 nm multimode, SC  
**ST85** for 850 nm multimode, ST  
**FC85** for 850 nm multimode, FC-PC  
**SC13** for 1300 nm single mode, SC  
**ST13** for 1300 nm single mode, ST  
**FC13** for 1300 nm single mode, FC-PC  
**SC13L** for 1300 nm laser diode, SC  
**ST15L** for 1300 nm laser diode, ST  
**FC13L** for 1300 nm laser diode, FC-PC  
**SC15L** for 1550 nm laser diode, SC  
**ST15L** for 1550 nm laser diode, ST  
**FC15L** for 1550 nm laser diode, FC-PC
- + 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)  
**E1** for E1 (2048 kbps)  
**T1** for T1 (1544 kbps)  
**UTP** for 10BT built-in bridge  
**BNC** for 10B2 built-in bridge
- ▲ Specify connector of G.703 interface (standalone unit only):  
**TB** for terminal block  
**RJ** for RJ-45

### PCU

Portable Control Unit with protective casing



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