BLACK BOX

*The World's Source for Cabling and Network Connectivity* SM

# E1/T1 FIBRE OPTIC MODEM

*Extend your E1 equipment to distances up to 50 Km over fibre optic cable.*

## *Product Features*

- **Zaps your E1 and T1 signals up to 50 Km on optical fibre.**
- **Frame-transparent (G.704).**
- **Supports symmetric and asymmetric E1 interfaces (coax).**
- **Multimode or monomode fibre as selected.**
- **Conforms to all the UIT standards concerned**
- **Diode laser for extended range of up to 50 km.**
- **Integrated diagnostics conforming to the V.54 standard.**

The **fibre optic modem E1/T1** increases the range of your E1 signals (2,048 Mbps) or T1 (1,544 Mbps) over optical fibre.

Designed to operate with different types and sizes of optical fibre, this modem lets you choose the optical interface depending on the type of cable available and ranges required. Three optical interfaces are offered:

- LED of 850 nm for use on multimode fibre providing a range of up to 5 km;
- LED of 1 300 nm for use monomode fibre with a range of up to 20 km;
- Diode laser of 1 300 nm for use on long distance monomode fibre up to 50 km.

The fibre optic modem E1/T1 conforms to the G.703, G.921 and G.956 standards of the UIT (formerly CCITT). Its electronic interface contains data recovery and timer circuits according to the G.703 standard. Frame transparent, it operates with both framed signals (G.704) as well as with non-framed signals (G.703).

An internal control selects the electronic interface of the fibre optic modem E1/T1 in conformity with the E1 or T1 standard:

- asymmetric 75 ohms for E1
- symmetric 120 ohms for E1
- symmetric 100 ohms for T1

Status LED's and a monitoring port indicate the correct operation of the system. On the optical interface the LED are identified by AIS and ERR and on the electronic interface by LOW and AIS. The monitoring port includes two alarm levels with dry contacts:

1) Minor alarms (AIS on the electric or optical interface);

2) Major alarms (low level on the electric interface and important rate of errors concerning the bits on the optical interface). There are also local and remote loopbacks.

The diagnostics conform to the UIT standards and are selected by means of a switch on the front panel.

The fibre optic modem E1/T1 offers all the advantages of fibre optics: immunity to noise, high security, absence of radio-electric interference and that caused by increased distance.

The unit is available in the form of an autonomous rack or as a card for a standard 19" chassis. The chassis can hold up to 14 fibre optic internal modems E1/T1. You can order special equipment separately for installing the internal modems in the chassis.

BLACK BOX

*The World's Source for Cabling and Network Connectivity* SM

*Specifications*

**Speed**: E1: 2,048 Mbps; T1: 1,544 Mbps

**Interface**: controlled by internal microswitches:
asymmetric 75 ohms for E1
symmetric 120 ohms for E1
symmetric 100 ohms for T1

**Code**: HDB-3, B8ZS

**Connectors**: SMA, ST or FC according to model; DB15 female; 2 BNC

**Wavelength**: 850 nm or 1 300 nm according to model

**Transmission power**:
-18 dBm for 850 nm on fibre 62,5/125
-18 dBm for 1 300 nm on fibre 62,5/125
-18 dBm for 1 300 nm on fibre 9/125
-12 dBm for laser on fibre 9/125

**Reception sensitivity**:
-38 dBm to 850 nm
-40 dBm to 1 300 nm

**Dynamic range**: 28 dB for all types of optical interface

**Indicator lights**: power supply (ON if the unit is powered up);
*optical*: AIS (ON if all the "1" chain is received by the optical interface), ERR (ON if the rate of error bits is more than $10^{-6}$);
*electric*: LOW (ON if the entry level of the electric interface is below the level G.703), AIS (ON if all the "1" chain is received by the electric interface)

**SNA** signalling (AIS): all the "1" signalling is transmitted over the electric interface if an optical signal is lost; all the "1" signalling is transmitted over the optical interface if the entry level of the electric interface is low (LOW)

**Monitoring port**: dry contacts, DB9 connector for minor and major alarms. Dry contacts normally open or normally closed

**Power supply**: 100/115/230 V ac (± 10%), 47 to 63 Hz, 6 W maximum, and 42 to 57 V dc

**Dimensions**: L 179 x D 203 x H 44 mm
**Weight**: 1,1 kg

**Protection**: isolating transformers on transmitting and receiving lines

*Ordering Information*

| *Item* | *Product code* |
|---|---|
| E1/T1 Fibre Optic Modem (850-nm) | |
| Multimode SMA | MEF2000-SM85-R2 |
| Multimode ST | MT611AE-ST |
| Multimode FC | MEF2000-FC85-R2 |
| E1/T1 Fibre Optic Modem (1300-nm) | |
| Single-Mode ST | MT610AE-ST |
| Single-Mode FC | MT613AE-FC |
| E!/T1 Fibre Optic Modem (1300-nm) | |
| Laser Single-Mode ST | MEF2000-STLA-R2 |
| Laser Single-Mode FC | MEF2000-FCLA-R2 |