Telco Systems
A BATM Company

Metrobility® T1/E1 Interface

Extending T1/E1 distance up to 100km

The Metrobility® T1/E1 interface by Telco Systems provides cost effective high-speed integration and conversion of T1 (1.544Mbps) or E1 (2.048Mbps) serial copper telco communication lines to fiber optic links. The T1/E1 interface line card can connect to PBX's, multiplexers, ATM/Frame Relay devices, routers, network servers and video CODECS achieving extended distances, high density, high quality of transmission, and improved security.

Regardless of line codes or framing, the copper data stream is converted to optical signals for greater noise immunity and longer transmission. The T1/E1 interface line card supports remote fiber optic links up to 2km over multimode (1310nm) and 100km over singlemode fiber (1550nm).

The T1/E1 interface operates seamlessly with low bit delay, and all signal activity is converted ensuring accurate communication within connected segments.

Flexible Platform Options

These modular interfaces are supported in the Metrobility chassis. DC versions of the R5000 and R1000 chassis are NEBS certified. The T1/E1 standalone version is enclosed in a rugged metal fabrication to offer superior reliability for the most demanding environments. Each standalone is equipped with an external, universal AC power supply.

Extensive SNMP Management

The Metrobility easy to use NetBeacon® ESP element management software provides end-to-end remote management to easily monitor framing errors, parity errors, CRC errors, bipolar violations, and far end fault alarms. NetBeacon ESP displays information about port type (T1/E1), transmit code configuration, line length configuration, line status, and loopback status as well as standard information such as serial number, revision level, date installed, etc.

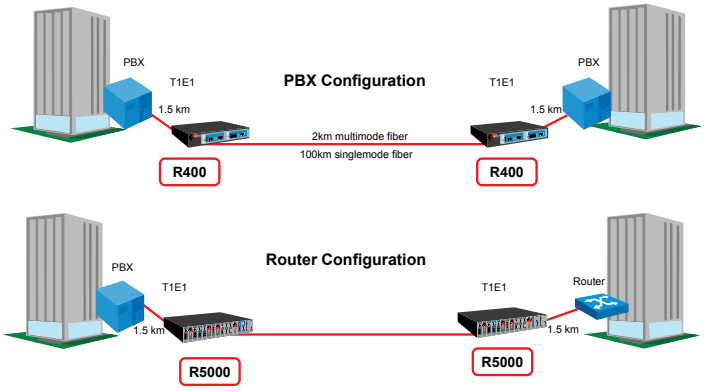
Unique Remote Test Capability

The T1/E1 Interface provides time and cost saving features such as local and remote loopback testing, built-in BERT (Bit Error Rate Testing) and intelligent software management. A service technician can initiate out-of-band loopback by using NetBeacon ESP to set the fiber port in loopback mode. For remote troubleshooting, the on-board BERT routine can be used to determine line quality. All errors will generate fault messages for diagnostic action and can be accomplished without a technician visiting the far end location.

- **Copper-to-multimode fiber conversion to 2km, or copper-to singlemode fiber conversion up to 100km**
- **AMI or B8ZS (T1)/HDB3 (E1) bipolar line code support on the copper interface**
- **Local and remote loopback monitoring and BERT 511 testing**
- **No jitter for maximum transmission quality**
- **Eight LED indicators for easy visual diagnostics**
- **MDI-II to MDI-X switch on the copper port eliminates the need for crossover cables**
- **T1 interface line cards are NEBS Level 3 certified**
- **Optional management information:**
  - Fiber and copper signal status
  - Port operational status
  - Port loopback mode
  - Board serial ID
- **ST or SC connectors on the fiber optic ports**
- **Surge protection for both ports**
- **Supports all common line codes**
- **Link and loopback LEDs**
- **Low power consumption**
- **High MTBF**

Metrobility T1/E1 Interface

High-speed integration and conversion



Key Applications

- **Extends T1/E1 distances up to 100km without repeaters**
- **NRZ (non-return to zero) data and clock encoding ensures reliable clock recovery at the remote fiber port**
- **User selectable line build out for short and long haul connections**

Ordering Information

Part Number		Description			
		Max. Supported Segment Length [1]			
Line Card	Standalone	Port 1+	Port 2	Port 1	Port 2
R105-13*	2105-13-01	T1 copper	T1 fiber		
		RJ-45	multimode SC	1.5km	2km
	2105-14-01	T1 copper	T1 fiber		
		RJ-45	singlemode SC	1.5km	20km
R105-15*	2105-15-01	T1 copper	T1 fiber		
		RJ-45	multimode ST	1.5km	2km
R105-17*	2105-17-01	T1 copper	T1 fiber, LH		
		RJ-45	singlemode ST	1.5km	40km
	2105-16-01	T1 copper	T1 fiber		
		RJ-45	singlemode SC	1.5km	20km
R105-1*J	2105-1J-01	T1 copper	T1 fiber ELH		
		RJ-45	singlemode SC	1.5km	100km
R165-13	2165-13-01	E1 copper	E1 fiber		
		RJ-45	multimode ST	1.0km	2km
R165-14	2165-14-01	E1 copper	E1 fiber		
		RJ-45	singlemode SC	1.0km	15km
R165-15	2165-15-01	E1 copper	E1 fiber		
		RJ-45	multimode ST	1.0km	2km
R165-17	2165-17-01	E1 copper	E1 fiber, LH		
		RJ-45	singlemode SC	1.0km	40km
R165-1J	2165-1J-01	E1 copper	E1 fiber ELH		
		RJ-45	singlemode SC	1.0km	100km

NOTE: * denotes NEBS-certified

+ Connector is an 8-pin modular jack wired as RJ-48

[1] Distance: The distances noted in the descriptions are for reference purposes only. The most important factor to achieve the desired distance is the "optical power budget" or fiber optic light measured in dB. The Metrobility descriptions generally indicate the typical transmit power budget for a specific fiber type (core diameter and numerical aperture).

Specifications

Interfaces

Data Rate

- 1.544Mbps (T1)
- 2.048Mbps (E1)

Power Input

- +5.0VDC @ 0.6A, 3W average

Network Connections

Twisted-Pair Interface

- Connector: Shielded RJ-45, 8-pin jack
- Impedance: 100 ohms T1 (balanced pair); 120 ohms E1 (balanced pair)
- Supported Link Length: up to 1,310 feet/396m (short haul); up to 4,500 feet/1.37km (long haul CSU)
- Cable Type: Category 5 UTP

Multimode Fiber Interface

- Connector: ST or SC
- Link Length: Up to 2km full duplex;
- Rx Input Sensitivity: -31dbm peak minimum
- Output Power: -20 dbm to -14 dbm

Singlemode Fiber Interface

- Connector: ST or SC
- Typical Link Budget: 23dB@15km, 33dB@40km, 37dB@100km
- Output Power: -15dBm to -8@20km; -5 to 0dBm@40km; -3 to 0dBm@100km
- Rx Input Sensitivity: -32.5@15km, -35@40km, 37@100km dBm peak minimum

General

Environmental

- Operating Temperature: 0°C to 50°C (R105/R165); 0°C to 55°C (2105/2165)
- Storage Temperature: -30°C to 70°C
- Operating Humidity: 5% - 95% non-condensing

Physical Specifications

- Weight: 5 oz; 0.14 kg (R105/R165); 3 lb; 1.36kg (2105/2165)
- Standalone Dimensions: 4.38"L x 3.26"W x 1.71"H; 12.3cm x 8.3cm x 4.3cm

Standards Compliance

- NEBS Level 3 (R105 only)

Safety and EMC Compliance

- UL; CSA
- EN60950 (safety)
- FCC Part 15 Class A
- DOC Class A (emissions)
- EN55022 Class A (emissions)
- EN55024:1998 (immunity)
- IEC 825-1 Classification (eye safety)
- Class 1 Laser Product (eye safety)
- ITU-G.703; G.706; G.824
- ANSI T1.403-1999
- ANSI T1.408

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