DXC Module

DE1B

E1 Link Module

- Two-port E1 interface module
- Available with copper or fiber optic line interface
- Range up to 100 km (62 mi) with fiber optic interface
- High-speed data rate of up to 2.048 Mbps
- Complies with ITU-T Rec. G.703, G.704, G.732, G.823, and G.956 standards

DE1B is a two-port E1 link module for use with RAD's modular Digital Cross-Connect units DXC-8R, DXC-10A, DXC-30, and DXC-30E. Each module provides two E1 links over copper or fiber optic interfaces that support both E1 and fractional E1 rates.

DE1B can be ordered with either a balanced copper or a fiber optic interface.

The following fiber optic, laser link options are available:

- 850 nm multimode
- 1310 nm single mode
- 1550 nm single mode, providing the maximum range of 100 km (62 mi).

DE1B supports 2 or 16 frames per multiframe (256N or 256S), user-selectable TS0 multiframe with CRC-4 option, and 2 Mbps unframed mode per ITU-T Rec. G.703.

2-port copper or fiber
E1 link module for the
DXC family of modular
cross-connects

RAD

data communications

Innovative Access Solutions

Modules with copper links have two jumper-selectable line interfaces available:

- 120Ω balanced interface terminated by an RJ-45 connector
- 75Ω unbalanced interface terminated by two BNC female connectors.

DE1B modules support two types of redundancy:

- Single-slot/line redundancy (1:1) ensures protective switching between ports on the same module within less than 50 ms.
- Y-cable redundancy switches between different modules to protect the service from hardware failure. This type of redundancy is supported by the copper interface only.

For longer range applications, copper link modules are available with an LTU option that extends the receive level to –40 dB.

The optional port bypass feature ensures continuous traffic support in case of power failure, by bypassing port 1 to port 2.

Two user-programmable timeslot routing modes are available for the module ports:

- Bidirectional with symmetrical routing
- Unidirectional with independent control over routing in each direction.

Setup, control, and diagnostics can be performed via a supervisory port using an ASCII terminal or by the RADview SNMP element management system. Remote units can be controlled using a dedicated management timeslot in the E1 path.

Diagnostic capabilities include self-diagnostics on power-up, local and remote loopbacks on each port, BER test on the active timeslots, and the inband code-activated loopback, specified in ANSI T1.403.

Table 1. Fiber Optic Interface Characteristics

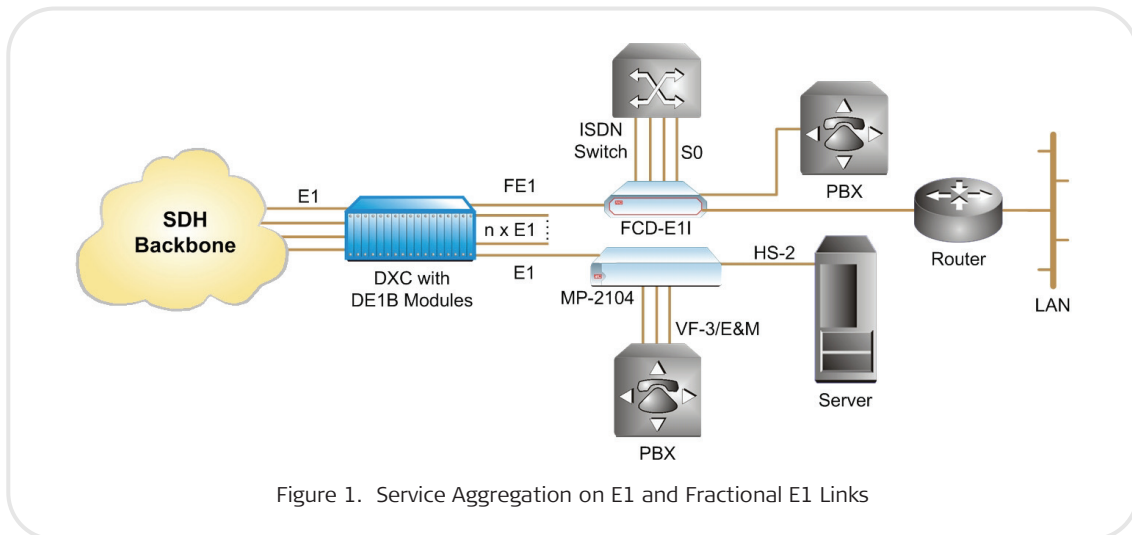| Laser Transmitter Wavelength [nm]	Fiber Type [µm]	Typical Output Power [dBm]	Receiver Sensitivity [dBm]	Typical Optical Budget [dB]	Typical Maximum Range [km]	[mi]
850	62.5/125 multimode	–17	–38	18	5	3
1310	9/125 single mode	–12	–34	25	55	34
1550	9/125 single mode	–12	–34	25	100	62

Figure 1. Service Aggregation on E1 and Fractional E1 Links

Specifications

Number of Ports
Two per module

Data Rate
2.048 Mbps

Compliance
ITU-T Rec. G.703, G.704, G.732, G.823

Framing
256N – no MF, CCS
256N – no MF, CCS with CRC-4
256S – TS16 MF, CAS
256S – TS16 MF, CAS with CRC-4
Unframed

COPPER INTERFACE

Line Code
HDB3

Impedance
120Ω, balanced
75Ω, unbalanced

Connectors (per port)
RJ-45, for balanced
Two BNC coaxial, for unbalanced

Signal Level
Receive:
0 to –40 dB with LTU
0 to –10 dB without LTU

Transmit:
±3V (±10%), balanced
±2.37V (±10%), unbalanced

FIBER OPTIC LASER INTERFACE

Operating Characteristics
See *Table 1*

Connectors
ST, FC/PC, or SC (see *Ordering*)

GENERAL

Timeslot Allocation
User-defined, any timeslot to any timeslot mapping

Timing
Receive: derived from a selected data port, can be used as external source for DXC master timing

Transmit: locked to master DXC timing source

Jitter Performance
Per ITU-T Rec. G.823, meets
ETSI TBR 12/13

Diagnostics
Local and remote loopbacks on each module port
BER testing
Inband code activated loopback

Indicators
L LOS (red) – Local port frame synchronization loss
R LOS (red) – Remote port frame synchronization loss

Power Consumption
3W at 0.6A

Configuration
Programmable via DXC management

Physical
3U occupies one DXC-8R/10A/30 module slot
6U occupies one DXC-30E module slot

Table 2. DXC Family Comparison Table

Features	DXC-8R	DXC-10A	DXC-30/30E	DXC-100
Height	1U	1U	3U/6U	6U per nest
Maximum number of ports	32	40	120/*	688 (8 nests)
Number of I/O slots	4	5	15	86 (8 nests)
System redundancy	Built-in	None	Optional	Optional
E1, T1, E3, T3, STM-1 modules	✓	✓	✓	✓
XDSL, inverse multiplexing modules	✓	✓	✓	–
n x 56/64 kbps modules	✓	✓	✓	✓
Router, OC-3 modules	–	–	–	✓
ASCII, SNMP, RADview management	✓	✓	✓	✓

* Maximum possible ports are 240 with the ISDN option only.

DE1B

E1 Link Module

Ordering

DXC-M-E1B/$/#/+
Two-port E1 Link Module, 3U-high

DXC-ME-E1B/$/#/+
Two-port E1 Link Module, 6U-high

Legend

$ Link interface type:

C   built-in LTU (copper interface only)

BP   port bypass

BP/C   built-in LTU and optional port bypass (copper interface only)

Link connector type (default is copper interface with coaxial BNC connectors):

ST   ST connectors

FC   FC/PC connectors

SC   SC connectors

+   Laser optical interface wavelength and transmitter type (not relevant with copper interface):

85L   850 nm, multimode

13L   1310 nm, single mode

15L   1550 nm, single mode

OPTIONAL ACCESSORIES

CBL-RJ45-Y/CROSS
Cross-cable for providing Y-cable redundancy. Includes four RJ-45 connectors, two on each side.

International Headquarters
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

North America Headquarters
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@radusa.com

www.rad.com

RAD
data communications
Innovative Access Solutions