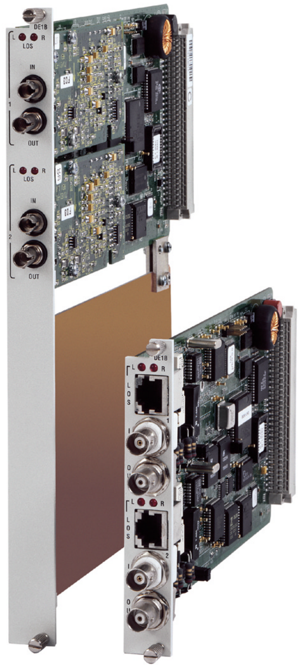
DXC Modules

DE1, DE1B

E1 Link Modules



FEATURES

- Two-port E1 interface modules for the DXC family
- Range up to 100 km with fiber-optic interface
- High speed data rate up to 2.048 Mbps
- Available with copper or fiber-optic line interface
- 2W/4W HDSL interfaces also available (see the *DHL/E1*, *DHL/E1/2W* data sheet)
- Comply with ITU-T Rec. G.703, G.704, G.732, G.823 and G.956 standards
- DE1B module supports BER test on selectable timeslots
- Optional bypass between links on the DE1B module
- Fits into any DXC chassis: DXC-8R, DXC-10A, DXC-30, DXC-STM-1; a special 6U-high version fits into DXC-30E chassis

DESCRIPTION

- DE1 and DE1B are two-port E1 link modules for use with the modular Digital Cross-Connect units (DXC-8R, DXC-10A, DXC-30, DXC-30E and DXC-STM-1). Each module provides two E1 links over either copper or fiber optic interface. The links support both E1 and fractional E1 rates.
- The DE1, DE1B modules can be ordered with either balanced copper or fiber optic interface.
- A number of fiber optic link options are available, including:
  - 850 nm multimode
  - 1310 nm single mode
  - 1310 nm single mode with laser
  - 1550 nm single mode with laser, providing the maximum range of 88 km.
- DE1 and DE1B support 2 or 16 frames per multiframe (256N or 256S) and user-selectable TS 0 multiframe with CRC-4 option. Additionally, DE1B supports 2 Mbps unframed mode per ITU-T Rec. G.703.
- Modules with copper links have two jumper-selectable line interfaces available:
  - 120Ω balanced line interface terminated by an RJ-45 connector
  - 75Ω unbalanced interface terminated by two BNC female connectors.
- DT1B modules support two types of redundancy:
  - Single-slot/line redundancy (1:1) ensures protective switching within less than 50 ms, between ports on the same module.
  - Y-cable redundancy between modules protects 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, which increases the receive level up to -40 dB.
- 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 network management system. Control of remote units can be implemented by a dedicated management timeslot in the E1 path.
- Diagnostic capabilities include self-diagnostics upon power-up and analog and remote loopbacks controlled by DXC.
  DE1B also features BER test on the active timeslots and inband code-activated loopback, specified in ANSI T1E1.2/93-003.

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 (DE1B only)

DE1, DE1B

E1 Link Modules

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 INTERFACE

- **Operating Wavelength**
  850, 1310 or 1550 nm
  (see *Ordering*)
- **Connectors**
  ST, FC/PC or SC (see *Ordering*)
- **Dynamic Range**
  28 dB for all types of optical interfaces

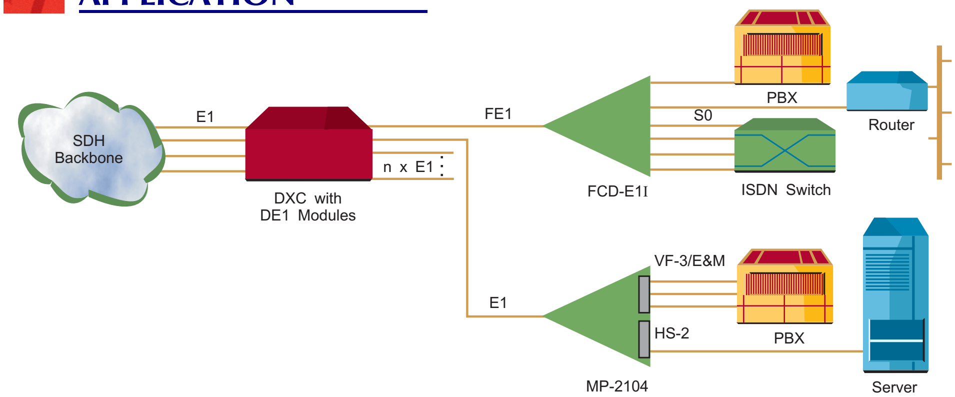
GENERAL

- **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 (DE1B only)
  Inband code activated loopback (DE1B only)
- **Indicators**
  L LOS Local Port Frame Synchronization Loss
  R LOS Remote Port Frame Synchronization Loss
- **Power Consumption**
  3W at 0.6A
- **Configuration**
  Programmable via DXC management
- **Physical**
  Occupies one DXC-8R/10A/30/30E module slot

Table 1. Power and Transmission Distances

Transmitter Type	Fiber Type	Output Power	Receiver Sensitivity	Maximum Distance
850 nm LED	62.5/125	-18 dBm	-38 dBm	5 km (3 mi)
1310 nm LED	9/125	-18 dBm	-40 dBm	45 km (29 mi)
1310 nm laser	9/125	-12 dBm	-34 dBm	55 km (34 mi)
1550 nm laser	9/125	-12 dBm	-34 dBm	88 km (55 mi)

APPLICATION



ORDERING

3U-high module versions:

DXC-M/E1/$
Two-port E1 Link Module

DXC-M/E1B/$/#+
Two-port E1 Link Module with BERT and loopback per timeslot

To order a 6U-high module version for DXC-30E chassis, add **E** after the **DXC-M** prefix of the corresponding option, for example: **DXC-ME/E1/$/#+**

To order HDSL interfaces, refer to the *DHL/E1, DHL/E1/2W data sheet*

$ Specify link interface options
C for built-in LTU (copper interface only)
BP for port bypass (DE1B only)
BP/C for built-in LTU and optional port bypass (DE1B and copper interface only)

Specify link connectors type:
ST for ST type connectors
FC for FC/PC type connectors
SC for SC type connectors
Default is copper interface with coaxial BNC connectors

+ Specify optical interface wavelength and transmitter type (not relevant with copper interface):
85 for 850 nm, multimode, LED
13 for 1310 nm, single mode, LED
13L for 1310 nm, single mode, laser
15L for 1550 nm, single mode, laser

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