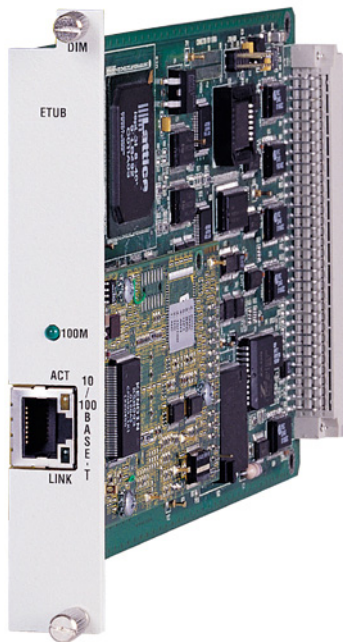


DXC Module

DIM

Digital Inverse Multiplexer Module



- V.35, X.21, RS-530, and HSSI sync interfaces
- High speed data rates of $n \times 1.920$ Mbps (E1) or $n \times 1.472$ Mbps (T1), with automatic fallback
- Optional high-speed 10/100BaseT Ethernet bridge data port with VLAN support according to ITU Rec. 802.1
- Optional E1 port for inverse multiplexing of a standard E1 frame over two T1 links

DIM is a digital inverse multiplexer module for the modular DXC units. The DIM module, working in conjunction with up to eight E1/T1 ports of DE1B, DT1B, D4E1, D8E1, D4T1, D8T1, D4SL, D8SL, DE3, DT3 or DFSTM-1 modules, enables DXC to function as an inverse multiplexer.

DIM transmits a single high-speed data stream of up to 15.36 Mbps over multiple E1/T1 lines. The inverse multiplexing technique breaks down the high-speed signals into multiple E1/T1 lines, and routes these signals over different paths or facilities while ensuring transmission integrity.

DIM bridges the bandwidth gap between E1/T1 and E3/T3 traffic, allowing bridges and routers to operate at their fastest rates. The module complies with ACCUNET Fractional T45 service (AT&T), providing a choice of four new transmission speeds that are intermediate between T1 and T3 rates. DIM can also transmit Ethernet traffic over D4SL or D8SL modules.

The module occupies a single slot in the DXC chassis. It can be installed in the DXC system together with other modules, to provide a combination of cross-connect and inverse multiplexing capabilities.

Differential delays of up to 64 msec between the E1/T1 lines are tolerated. DIM compensates for such delays, and the original stream is reconstructed.

Splits a single high-rate logical channel into up to eight E1/T1 links



DIM

Digital Inverse Multiplexer Module

DIM is available with a number of options for the user data ports, including an 10/100BaseT Ethernet bridge with VLAN support, an E1 port, or a choice of sync data interfaces: V.35, RS-530, X.21, or HSSI (High Speed Serial Interface).

For E1 links, the total data rate is in multiples of 1.920 Mbps, up to 15.36 Mbps; for T1 links, the total data rate is in multiples of 1.472 Mbps, up to 11.776 Mbps.

The automatic rate fallback feature ensures that the logical channel remains open even if individual E1/T1 links fail, by automatically dropping to the next lower rate. When failed links are recovered, DIM automatically returns to the original rate.

Note: Not relevant for E1 port version.

The V.35 and RS-530 channel interfaces terminate in 25-pin D-type female connectors. Pin assignment is compatible with RS-530 specifications. Special adapter cables can be ordered to connect the V.35 channel to standalone V.35 equipment. The X.21 channel interface terminates in a 15-pin D-type female connector. The HSSI channel interface terminates in a 50-pin SCSI-2 connector.

The E1 port option enables DIM, working in conjunction with a DT1B, D4T1, D8T1, or DT3 module, to function as an E1 to T1 rate converter. Each E1 frame (2.048 Mbps) received by the DIM E1 port, is converted into two T1 frames (2×1.544 Mbps), and then transmitted simultaneously over the two T1 links of the DXC T1 interface module. DIM with the E1 port complies with AT&T TR-54019 for E1 access over T1 facilities.

When equipped with the 10/100BaseT Ethernet interface, DIM connects virtual LANs over $n \times 56$ kbps, or $n \times 64$ kbps lines. With the 10/100BaseT bridge DIM filters Ethernet/Fast Ethernet frames, forwarding only frames destined to the WAN. The 10/100BaseT module can also block broadcast and multicast messages.

DIM has four user-selectable clock modes for the user data port:

- **DCE:** DIM provides both TX and RX clocks to the user DTE
- **External-DCE:** DIM provides RX clock to the user while receiving TX clock from the user.

The above two modes provide a gapped clock signal.

- **Smooth:** same as DCE, but provides a smooth (constant rate) clock
- **External-Smooth:** same as External-DCE, but provides a smooth (constant rate) clock.

Note: The E1 and HSSI ports operate in External-DCE mode only; the Ethernet port operates in DCE mode only.

Diagnostic capabilities include local and remote DTE loopbacks, and a built-in BERT. When activated, the BERT replaces the DTE input and transmits a test pattern to all of the connected E1/T1 links.

The module occupies one I/O slot in the DXC chassis.

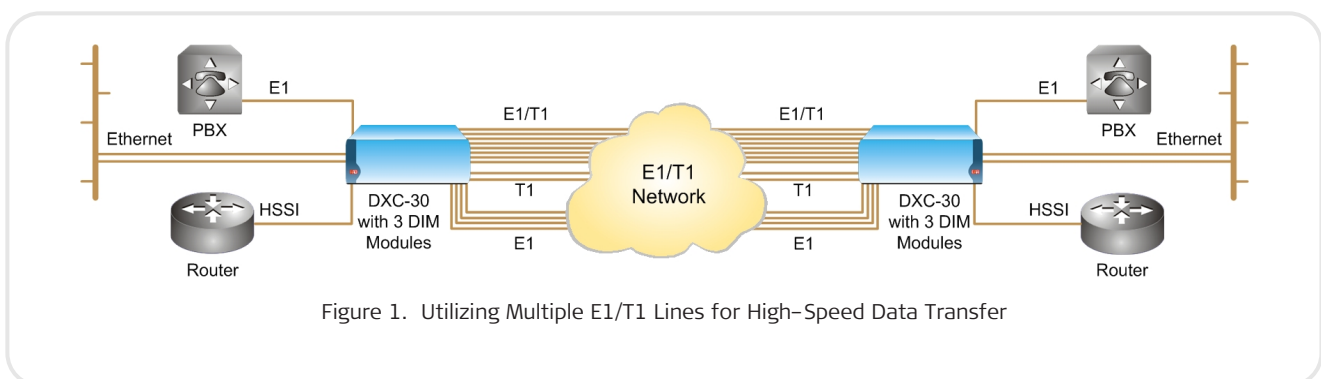


Figure 1. Utilizing Multiple E1/T1 Lines for High-Speed Data Transfer

Specifications

Inverse Multiplexing

Up to 8 E1/T1 links
(2 T1 for E1 port version)

Data Rate (for user data port)

E1: any multiple of 1.920 Mbps, up to 15.360 Mbps
T1: any multiple of 1.472 Mbps, up to 11.776 Mbps

Automatic Rate Fallback

Upon failure of an individual E1/T1 link, DIM automatically falls back to the next lower data rate

E1/T1 Differential Delay

Up to 64 msec

Clock Modes (for user data port)

DCE, External-DCE, Smooth, External-Smooth

Note: The E1 and HSSI ports operate in External-DCE mode only; the Ethernet port operates in DCE mode only.

SYNC DATA PORT

Interfaces and Connectors

V.35: 34-pin female (via adapter cable)
RS-530: 25-pin D-type female
X.21: 15-pin D-type female
HSSI: 50-pin SCSI-2, female

E1 PORT

Data Rate

2.048 Mbps

Connectors

Balanced: one RJ-45
Unbalanced: two BNC coaxial

Framing

E1 unframed

Compliance

AT&T TR-54019 for E1 access over T1 facilities

10/100 FAST ETHERNET BRIDGE PORT

LAN Table

512 MAC addresses with 5-minute automatic aging

Filtering and Forwarding

150,000 frames per second

Frame Size

1535 bytes maximum

Buffer

85 frames (average)

Line Code

10BaseT: Manchester
100BaseT: MLT3

Data Rate

10BaseT: 10 Mbps
100BaseT: 100 Mbps

Connector

RJ-45

WAN Protocol

HDLC

Indicators

LINK, ACT, 100M

Compliance

Conforms to IEEE 802.3/Ethernet, IEEE 802.1p

GENERAL

Timing (DXC System)

System clock source:
Internal (± 32 ppm)
Station clock
Receive clock (from any link)

Diagnostics

Local and remote DTE loopbacks
BERT

Physical

Occupies a single slot in a DXC-8R, DXC-10A or DXC-30 chassis

For comparison of DXC chassis, see *Table 2*. For the list of DXC I/O modules, refer to the DXC-8R/10A/30 folder.

Power Consumption

HSSI: 9.5W
ETUB: 7.5W
Other interfaces: 5.5W

Environment

Temperature: 0°-40°C (32°-104°F)
Humidity: Up to 90%, non-condensing

DIM

Digital Inverse Multiplexer Module

Ordering

DXC-M-DIM/^

Legend

^ User port interface:

V35 V.35**530** RS-530**X21** X.21**E1** E1 interface (E1 over two T1 links)**ETUB** Ethernet bridge port with 10/100BaseT (UTP) interface**HSSI** High Speed Serial Interface

OPTIONAL ACCESSORIES

The following cables adapt the DIM V.35 user ports DB-25 connectors to the specified applications. Cable length is 2m (6 ft).

CBL-HS2/V/1/@

Adaptor cable for connecting a V.35 DTE using DCE clock mode

CBL-HS2/V/2/@

Adaptor cable for connecting a V.35 DCE using external DCE clock mode

@ Cable connector on user side:

F female**M** male

Table 2. DXC Chassis Comparison Table

Feature	DXC-8R	DXC-10A	DXC-30	DXC-100*
Height	1U	1U	3U	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	✓	✓	✓	✓

**The DXC-8R/10A/30 modules and DXC-100 modules are not interchangeable.*

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



data communications

The Access Company