

DXC Modules

D4SL, D8SL

2-wire SHDSL E1 Link Modules

4- and 8-port SHDSL
I/O modules
for the DXC family
of modular
cross-connects



- Four- and eight-port SHDSL E1 link modules for the DXC family
- Up to 2048 kbps per port over existing 2-wire copper cables
- User-selectable data rates between 64 kbps to 2048 kbps
- Range up to 8 km (5 mi) over 24 AWG 2-wire cables
- ITU-T Rec. G.991.2 SHDSL compliance

D4SL and D8SL are four- and eight-port I/O modules that use Single-pair High-speed Digital Subscriber Line (SHDSL) technology, according to ITU-T Rec. G.991.2.

Each port is a multirate SHDSL modem operating at user-selectable data rates that are multiples of 64 kbps (1 timeslot), up to 2048 kbps (32 timeslots). Payload capacity per module is up to 128 timeslots (8.192 Mbps) or 256 timeslots (16.384 Mbps). *Table 1* lists typical range data versus payload data rate.



data communications

The Access Company

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The D4SL/D8SL modules can be configured to operate in accordance with ITU-T Rec. G.991.2, Annex B, for compatibility with European (or similar) networks.

Each port transfers either G732N or G732S multiframes (2 or 16 frames per multiframe, respectively). The user can also enable the CRC-4 option, specified in ITU-T Rec. G.704 and G.703, independently for each remote port.

All ports can operate in unframed mode to transparently transmit unframed 2.048 Mbps signals.

The modules can operate as a central SHDSL solution opposite RAD's ASMi-52 SHDSL modems or FCD-IP and FCD-IPM access devices. The units also link with other vendors' ITU-T G.991.2 compatible SHDSL remote terminal units.

Timeslot traffic through any port can be cross-connected with any other DXC module (excluding another D4SL/D8SL port or module)

D4SL can operate as a remote solution by using an SHDSL uplink to connect the unit to another DXC or other standard SHDSL equipment.

Diagnostic capabilities include local and remote loopbacks on the link, BER test on the active timeslots, and inband code-activated loopbacks specified in ANSI T1.403. Performance statistics for the link may be obtained and analyzed via the DXC management system.

Setup, control, and diagnostics can be performed using an ASCII terminal connected to the supervisory port, or by the RADview SNMP based management system.

D4SL/D8SL modules operating in the DXC-30 chassis require a fan tray for external cooling (see *Ordering*). The DXC-8R and DXC-10A chassis do not require additional cooling.

The modules occupy one I/O slot in the DXC-30, DXC-10A or DXC-8R chassis.

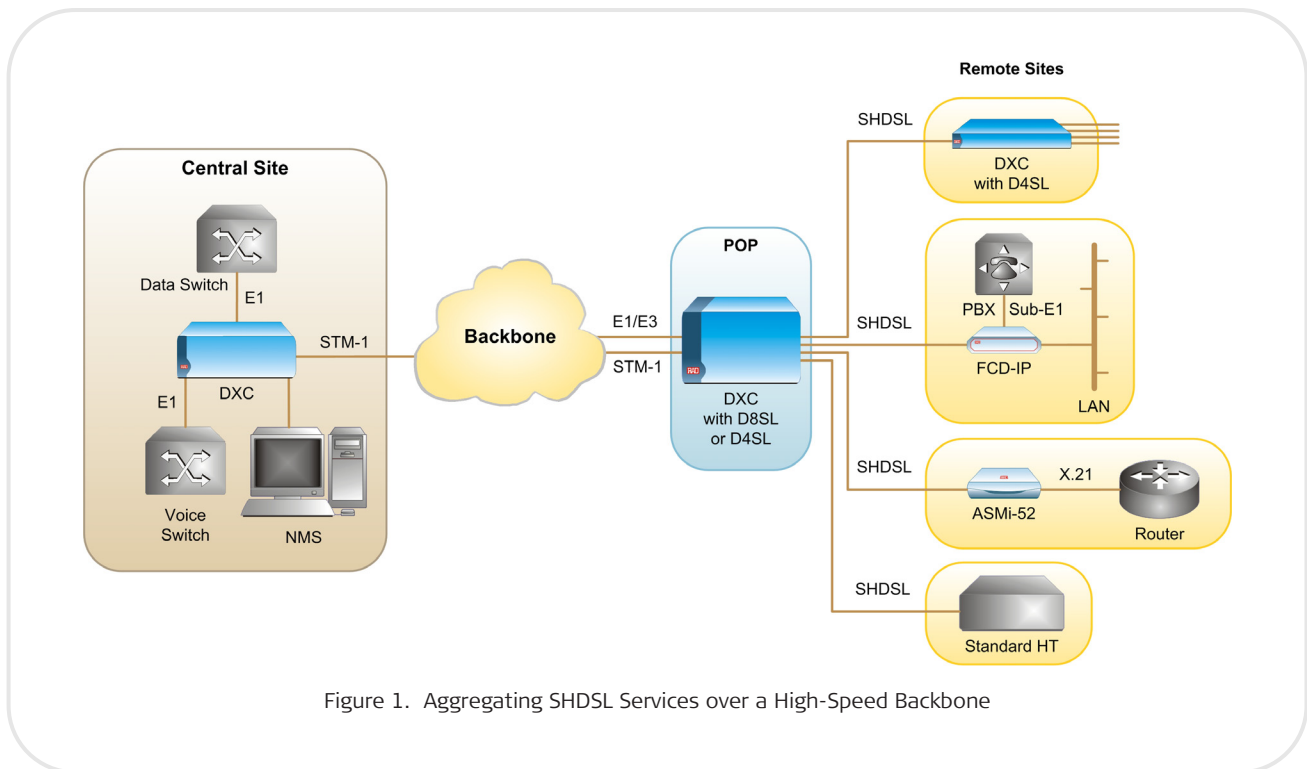


Figure 1. Aggregating SHDSL Services over a High-Speed Backbone

Specifications

EXTERNAL PORTS

Number of Ports

4 or 8

Interface Type

SHDSL

Standard

ITU-T Rec. G.991.2

Line Type

Single unloaded and unconditioned copper twisted pair

Nominal Line Impedance

135Ω

Typical Ranges

See *Table 1*

Connector

Single 25-pin D-type female connector for all ports

INTERNAL E1 PORTS

Framing

G732N – 2 frames per multiframe

G732S – 16 frames per multiframe

Unframed

Standards

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

DIAGNOSTICS

Performance Monitoring

Per ITU-T Rec G.991.2

Loopbacks

User-activated local and remote loopback on each port

Remote loopback activation by inband FT1 code (on all timeslots, or on specific timeslots)

Remote timeslot loopback

Remote loopback on the remote unit

BER testing on each port

GENERAL

Indicators per Port

SYNC LOS (red) –

On: not synchronized with the remote unit
Flashing: handshaking with the remote unit

SYNC LOS (green) –

On: synchronized with the remote unit
Flashing: synchronizing with the remote unit

TEST (yellow) –

On: test is active on the port

Configuration

Programmable via the DXC management system

Timing

D8SL, D4SL central site module: locked to DXC master clock

D4SL remote site module: locked to the central site module

Power Consumption

18.5W at maximum data rate on all the ports

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.

Table 1. Typical Range vs. Payload Data Rate

Data Rate [kbps]	Range @ 26 AWG	
	[km]	[mi]
256	6.5	4
512	5.6	3.5
768	4.55	2.8
1024	3.65	2.7
1536	3.2	2
2048	3	1.85

Note: Typical ranges are based on error-free real-line laboratory tests without noise.

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Ordering

DXC-M-8SL-E1

8-port, 2-wire SHDSL E1 link module

DXC-M-4SL-E1/\$

4-port, 2-wire SHDSL E1 link module

Legend

\$ Line interface:

STUC central site module**STUR** remote site module

OPTIONAL ACCESSORIES

CBL-D4SL-STUC

Adapter cable for D4SL (central site module), splits a DB-25 connector into 4 × RJ-45 balanced connectors

CBL-D4SL-STUR

Adapter cable for D4SL (remote site module), splits a DB-25 connector into 4 × RJ-45 balanced connectors

CBL-D8SL-RJ45/X

Adapter cable for D8SL, splits a DB-25 connector into 8 × RJ-45 balanced connectors

DXC-30M-FT/~

Fan tray (for the DXC-30 chassis only)

Legend

~ Fan tray power supply:

AC 100 to 240 VAC**48** -48 VDC

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	✓	✓	✓	✓

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

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