



4-10 Channel DWDM Muxponders

DarkStar® DSM10 Series



The DSM10 is part of XKL's DarkStar DWDM Muxponder family of products and is based on XKL's DarkStar architecture, the foundation for addressing today's IT challenges and scalable growth.

These systems enable customers to soft-configure the aggregation of 1G through 100G services, including optical amplifiers for extending network reach, filters, protection solutions, and other optical components that are required for any optical network. Organizations can easily plan for increasing capacity to address bandwidth needs, as well as to meet the demand in the growth of mobile devices, streaming video, and bandwidth intensive applications.

The DSM10 systems are field upgradable appliances that can grow to 40 channels (400G) by adding the DarkStar Mux/Demux (DMD), making them ideal for point-to-point and rings, data center interconnect, as well as for those who are unsure about future bandwidth requirements.

DSM10 systems install in under an hour and require only 1 rack unit (1U) of space. A typical DSM10 uses between 66 and 83 watts of power, and has a data propagation latency of 44 nanoseconds (ns)* per system (10G or 100G).

The DSM10 is a DWDM appliance. As such, network administrators can deploy and commission these systems in a fraction of the time it takes to deploy traditional optical transport equipment. Setting up the management network, as well as configuring services, are done in minutes. All the complexities of building an optical network are handled by the DSM10 system, leaving network administrators with confidence in their deployments.

* Latency is model dependent. Test equipment has timestamps with 20ns of resolution.



More about this product...

Integrated System Architecture:

- Fully integrated optical components including DWDM Mux/Demux filter, Erbium-Doped Fiber Amplifier (EDFA), Dispersion Compensation Module (DCM)
- Digital ROADM (Reconfigurable Optical Add Drop Multiplexer): remotely switch traffic, any-to-any mapping
- No layer 2/3 protocol processing, no data buffering. This is both a reliability and security feature; impossible to access transport data through management network.

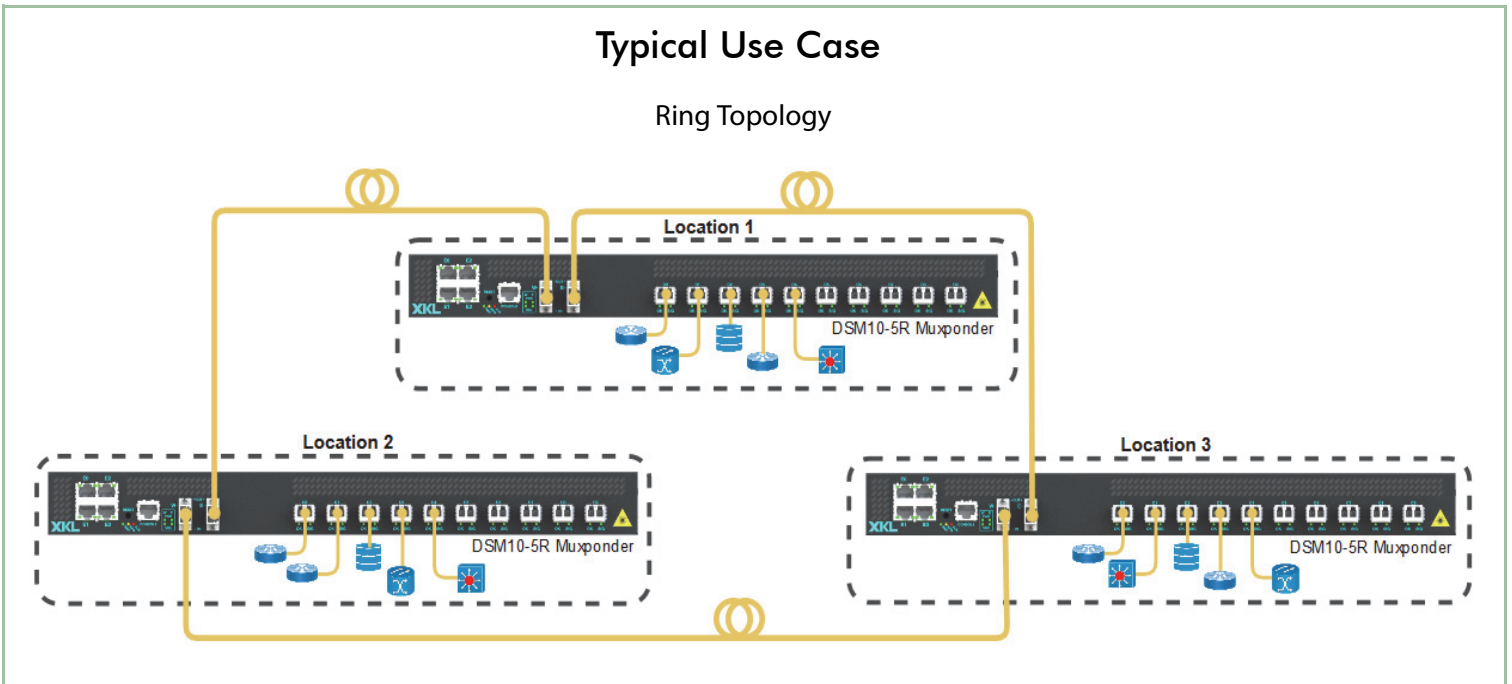
System Level Features:

- Hot-swap components:
 - 1+1 redundant power supplies, supports AC and DC
 - Redundant fans
 - Laser transceivers: SFP+ and Optical Service Channel (OSC)
- Field-replaceable dual flash storage modules; one is write-protected
- Hitless software upgrades - no customer data loss
- System-wide watchdog timer to ensure software response
- Automatic fiber path protection available in all systems, with detection and path switching speeds under 20 ms

Also see "Technical Specifications" on back.

Typical Use Case

Ring Topology



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4-10 Channel DWDM Muxponders

Technical Specifications

Supported Topologies

Point-to-Point, Linear, Ring, and Protected

Capacity/Growth

40G per chassis (DSM10-2R and DSM10-4):

DSM10-2R Growth: 400G East/400G West (requires adding DMD with 4-Band filter)

DSM10-4 Growth: 160G (requires adding DMD with 4-Band filter)

100G per chassis (DSM10-5R or DSM10-10):

DSM10-5R Growth: 400G East/400G West (requires adding DMD with 4-Band filter)

DSM10-10 Growth: 400G (requires adding DMD with 4-Band filter)

Network Management and Control Plane

Command line interface (CLI):

RS-232 serial console port
TELNET and SSH

Dedicated management network:

4x 10BASE-T/100BASE-TX Ethernet ports
IPv4/IPv6 dual stack
IPv4 forwarding, RIP routing
DHCP boot client, BOOTP relay
DHCP server

Security:

Simple password
Local account database
RADIUS and TACACS+ client
Host-based Access Control Lists (ACLs)

Monitoring:

Network Syslog, Local event log
SNMP versions 1 and 2C
RFC1213-MIB, SNMPv2-MIB, IF-MIB, XKL-MIB

Administration:

SNTP time synchronization client
TFTP file transfer client
Telnet remote command-line client
Reboot and upgrade management operating system without interrupting customer data

Optical Service Channel

1-2

Supported Reach

Supports links up to 150km
(0.25dB/km of fiber loss)

Supported Fiber Types

G.652, G.654, G.655 (others supported on demand)

Product Configurations

DSM10-10: 10 x 10G on one fiber pair

DSM10-5R: 2 x (5 x 10G) East/West on two fiber pairs

DSM10-4: 4 x 10G on one fiber pair

DSM10-2R: 2 x (2 x 10G) East/West on two fiber pairs

Optionally includes: EDFA per-amp, EDFA booster, DCM, AC/DC Power Supplies, 1U chassis

Optical Components/Characteristics

Wavelengths:

4 Channel: 4 wavelengths (DSM10-4 and DSM10-2R)
10 Channel: 10 wavelengths (DSM10-10 and DSM10-5R)

Wavelengths per Fiber Pair:

DSM10-10: 10 wavelengths on one fiber pair
DSM10-5R: 5 wavelengths on each of two fiber pairs
DSM10-4: 4 wavelengths on one fiber pair
DSM10-2R: 2 wavelengths on each of two fiber pairs

Amplification: EDFA pre-amp, EDFA booster

Mux/Demux:

2 Channel Mux/Demux with OADM, 100GHz spacing (DSM10-2R)
5 Channel Mux/Demux, 100GHz spacing (DSM10-4, DSM10-5R);
5 Channel OADM filter, 100GHz spacing (optional for DSM10-5R)
10 Channel Mux/Demux, 100GHz spacing (DSM10-10)

DCM: G.652, G.654, G.655 - up to 160km of dispersion compensation

Client-side Optics: SFP+: 850nm or 1310nm

Line-side Optics: 1530.33nm-1561.42nm with 100GHz spacing

Integrated Filter Loss: 3.7dB (Typical 10 Channel Mux+Demux)

Optical Protection

Wave Protection

Services

(All services are soft configurable.)

Ethernet: 1GE, 10GE, 10GE + FEC, 40GE (4 wavelengths), 100GE (10 wavelengths)

SONET: OC48/STM16, OC192/STM64, OC192 + FEC (OTU3)

Fiber Channel: 1G, 2G, 4G, 8G, 10G

Client Interfaces

Number of client-side ports per system:

4 Channel: 4 x SFP+ (DSM10-4, DSM10-2R)
10 Channel: 10 x SFP+ (DSM10-10, DSM10-5R)

Line Interfaces

Number of line-side ports per system:

4 Channel: 4 x tunable SFP+ (DSM10-4, DSM10-2R)
10 Channel: 10 x tunable SFP+ (DSM10-10, DSM10-5R)

Physical Dimensions

IEC 60297-3 Compliant

Height: 1U (1.75"/44.5mm)

Width/Depth:

16.9"/27.3" (29.5" with cable relief)
429.3mm/693mm (749.3mm with cable relief)

Weight, minimum: 32lbs/14.5kg (No options: EDFA, DCM, etc.)

Power and Cooling

Power input AC: 100-240V AC, 50/60Hz

Power input DC: -48 to -60V DC
(1+1 redundant AC or DC, or both)

Power consumption, typical:

10 channel: 74W (83W maximum)

Environmental

Operating temperature: 0 to 55°C

Storage temperature: -40 to 70°C

MTBF: 87,600 hours

Non-operating (Shock and Vibration): ISTA-2A, IEC60068-2-6, 60068-2-64, 60068-2-27

Laser Safety Classification

Class 1

Regulatory Compliance

UL: IEC 60950-1(ed.1), IEC 60825-1:2007 (2nd Edition)

FCC: Conducted and Radiated Emissions, Part 15 Subpart B Sections 15.107 and 15.109 Class A

CE: EN55024 (1998 w/A1: 01 & A2: 03, EN61000-3-2 (2006), EN61000-3-3 (1995 w/A1:01 & A2:06), EN55022 (2006) Class A & CISPR 22 (2005) Class A

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