



Mux/Demux with Amplification Systems

DarkStar® DMD-A Series



The DMD-A is XKL's DarkStar Mux/Demux featuring integrated amplification and protection switching options. As with the rest of the XKL product line, the DMD-A is based on XKL's DarkStar architecture, the foundation for addressing today's IT challenges and scalable growth.

The DMD-A offers an array of optional integrated features for optimal network flexibility and manageability. It aggregates and provides monitoring capabilities for a mix of 1G through 400G technologies, resulting in greater control and scalability.

The DMD-A provides a variety of filter options including 48-channel or 96-channel Mux/Demux with 4-band or 6-band filter, all of which allow for point-to-point or east/west configurations. There is support for up to four Erbium-Doped Fiber Amplifiers (EDFAs), depending on other installed options.

The DMD-A also includes an integrated optical switch for path protection, as well as Dispersion Compensation Modules (DCMs). DCMs are passive, Fiber Bragg Grating (FBG) based filters that provide the necessary dispersion compensation for any customer fiber type, and are typically required for transmission systems using direct-detect transceivers.

The DMD-A can serve as an integral part of an XKL network solution or can inter-operate with any optical networking equipment that utilizes the standard ITU grid with 50GHz or 100GHz channel spacing.

Along with reduced power consumption, the DMD-A is compact in size—available in either 1 rack unit (1U) or 2 rack unit (2U) configurations. Easy to integrate and operate, there is no need for specialized optical engineers to ensure network optimization.



More about this product...

Integrated System Architecture:

- Fully integrated optical components including DWDM Mux/Demux filters, EDFAs, Optical Protection Switch, Dispersion Compensation Module (DCM), and Optical Service Channel (OSC)

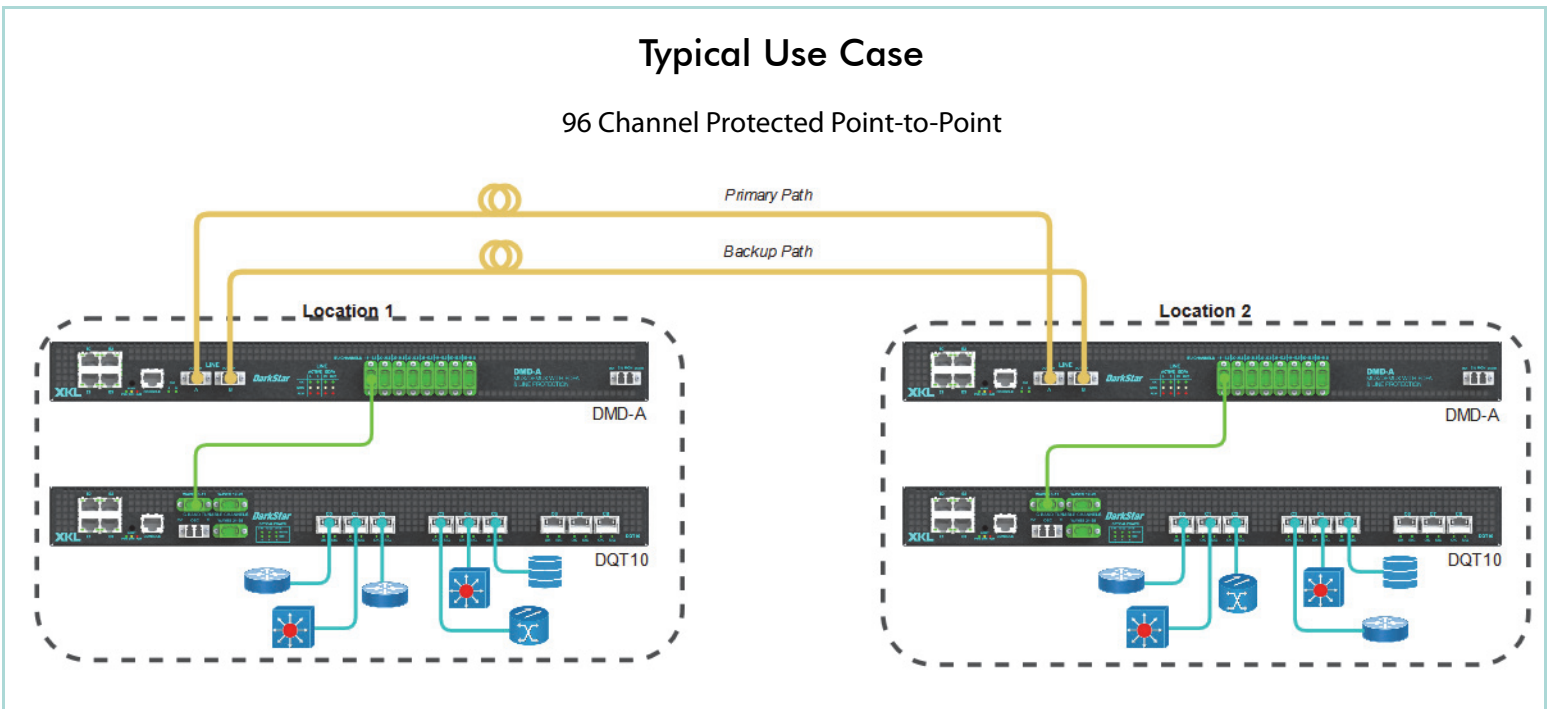
System Level Features:

- Hot-swap components:
 - 1+1 redundant power supplies, supports AC and DC
 - Redundant fans
 - Optical Service Channel (OSC) transceivers
- 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

Also see "Technical Specifications" on back.

Typical Use Case

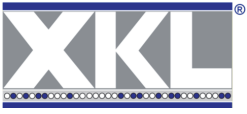
96 Channel Protected Point-to-Point



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Technical Specifications

Supported Topologies

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

Capacity

DMD-A (single)

One 48 or 96 channel filter
One 4-band or 6-band filter
1 to 2 EDFAs
Up to 1 DCM
Up to 1 Optical Switch

DMD-A (dual)

Two 48 or 96 channel filters
Two 4-band or 6-band filters
1 to 4 EDFAs
Up to 2 DCMs
Up to 1 Optical Switch

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 to 2

Supported Reach

Links up to 150 km

Supported Fiber Types

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

Product Configurations

48 or 96 Channel filters; 4-Band or 6-Band filters
Optionally included: EDFA pre-amp, EDFA booster, DCM,
Optical Switch, AC/DC power supplies, 1U or 2U chassis

Optical Components/Characteristics

OSC passband: 1503.5nm-1516.5nm
Line monitoring port: 2% tap
Pin = -35dBm
NF = 5.5dB (optimum gain and power settings)
Max gain = 43dB
Gain flatness = ± 0.75 dB
(22dB gain ingress and egress for optimum gain flatness)

96 channel filter:

ITU channels 14-61.5, 1566.31nm - 1528.38nm
50GHz channel spacing

48 channel filter:

ITU channels 14-61, 1566.31nm - 1528.77nm
100GHz channel spacing

4-band filter:

192.45 THz \pm 463.75 GHz
193.45 THz \pm 463.75 GHz
194.45 THz \pm 463.75 GHz
195.45 THz \pm 463.75 GHz

6-band filter:

191.45 THz \pm 463.75 GHz
192.45 THz \pm 463.75 GHz
193.45 THz \pm 463.75 GHz
194.45 THz \pm 463.75 GHz
195.45 THz \pm 463.75 GHz
196.45 THz \pm 463.75 GHz

Optical loss:

6.5dB - 96 channel Mux or Demux
5.0dB - 48 channel Mux or Demux
0.5dB - Optical Service Channel (OSC)

Optical Protection

Optical Protection Switch

Physical Dimensions

IEC 60297-3 Compliant

Height: 1U (1.75"/44.5mm)/2U (3.5"/88.9mm)

Width/Depth:

1U: 16.9"/27.3" (29.5" with cable relief)
429.3mm/693mm (749.3mm with cable relief)
2U: 16.9"/17.5" (19.8" with cable relief)
429.3mm/444.5mm (502.9mm with cable relief)

Weight, minimum: 35lbs/15.9kg (fully configured)

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: 70-90 watts (110 watts maximum)
(Typical DMD-A has 1 EDFA and fans running at nominal speed)

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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