



# 400G 4-12 Channel DWDM Transponder

## DarkStar DQT400 Series

The DQT400 is part of XKL's DarkStar DWDM Transponder 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 100GE and 400GE services. 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 DQT400 utilizes the latest pluggable coherent technologies to enable metro and long-haul connectivity for high-speed data networks.

DQT400 systems install in under 30 minutes and are available in a 1 rack unit (1U) configuration. The DQT400 utilizes the DarkStar DMD Mux/Demux in order to aggregate up to 48 wavelengths on a single fiber pair. Alternatively, the DQT400 can provide alien wave injection into an existing customer network. The DQT400 systems are fully tunable and allow for a customer to grow their network to 19.2Tb in 5U of rack space. A 12-channel DQT400, transporting 4.8Tb of bandwidth, uses only 470W.

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.

### More about this product...

#### Integrated System Architecture:

- DWDM Solution
- 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.
- Tunable system (based on ITU grid)
- 100G/400G
- QPSK, 16QAM

#### System Level Features:

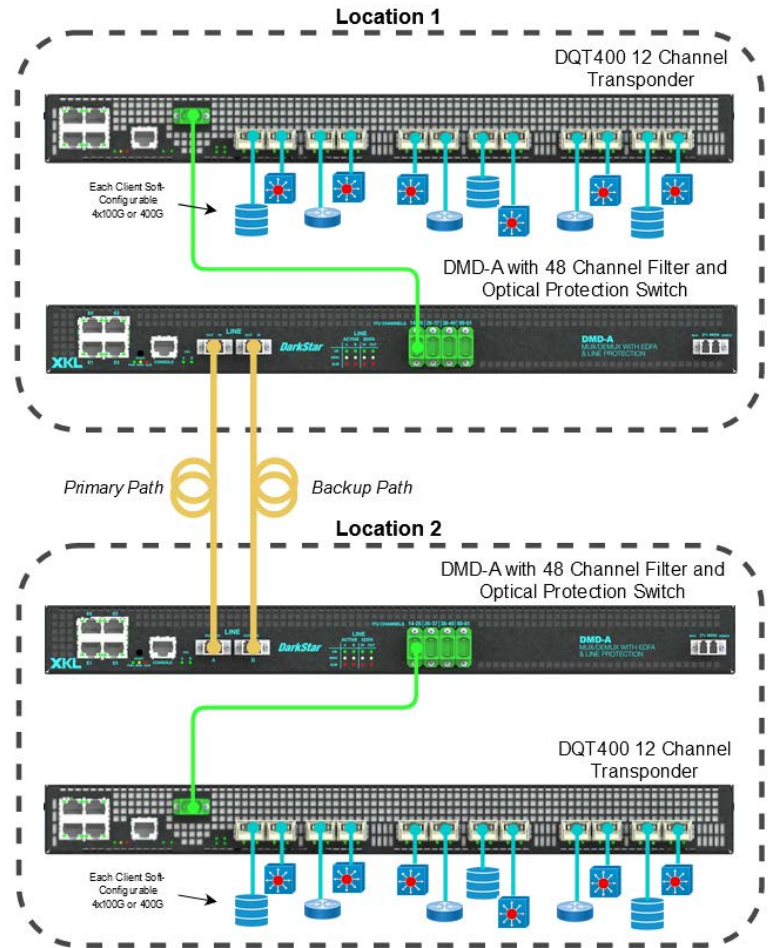
- Hot-swap components:
  - 1+1 redundant power supplies, supports AC and DC
  - Redundant fans
  - Optical transceivers: QSFP28, QSFP-DD
- Field-replaceable C-Band Tunable OSFP transceivers
- Dual flash storage modules; one is write-protected
- Hitless software upgrades - no customer data loss
- System-wide watchdog timer to ensure software response

Also see "Technical Specifications" on back.



### Typical Use Case

#### 12 Channel Protected Point-to-Point with Growth to 48 Channels



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### Supported Topologies

Point-to-Point, Ring, Linear, Mesh, and Protected (using DMD-A)

### Capacity/Growth

A DQT400 system has 4 or 12 DWDM channels, depending on the model. Each DWDM channel can be configured for 100G or 400G operation. In 400G mode, a DQT400 4-channel supports 1.6Tb of capacity, while a DQT400 12-channel supports 4.8Tb.

Each client port supports a variety of QSFP28 or QSFP-DD transceivers. The client ports are also soft-configurable, supporting 100GE, 2x100GE, 3x100GE, 4x100GE, and 400GE operation. A 4-port DQT400 can support 16 100GE services, 4 400GE services, or a combination of 100GE and 400GE services. Similarly, a 12-port DQT400 supports 48 100GE services, 12 400GE services, or a combination of 100GE and 400GE services.

A network of DQT400 systems can grow to 48 DWDM channels by connecting a DarkStar DMD 48-channel mux/demux, thus allowing for up to 192 100GE client services or 48 400GE client services.

### 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

### Supported Reach

Links up to 2000km using DarkStar DLA (in-line amplification) systems, and depending on the line-side modulation scheme: 100G, 200G, 300G, or 400G.  
(0.25dB/km of fiber loss)

### Supported Fiber Types

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

### Product Configurations

DQT400-4 (4 port)  
DQT400-12 (12 port)  
Optionally includes: various client interfaces, AC/DC power supplies

### Optical Components/Characteristics

**Client-side Optics:** QSFP28, QSFP-DD

**Line-side Optics:** DWDM: OSFP-DCO (C Band: 1533.47nm-1561.42nm) with 100GHz spacing

### Optical Protection

Optical Protection available via the DMD-A

### Services

(All services are soft configurable.)

**Ethernet:** 100GE, 400GE

### Client Interfaces

#### Number of client-side ports per system:

4 (QSFP28/QSFP-DD) - Up to 1.6Tb client-side services  
12 (QSFP28/QSFP-DD) - Up to 4.8Tb client-side services

### Line Interfaces

#### Number of line-side ports per system:

4 (OSFP) - Up to 1.6Tb (400G per port)  
12 (OSFP) - Up to 4.8Tb (400G per port)

### Physical Dimensions

IEC 60297-3 Compliant

**Height:** 1U (1.75"/44.5mm)

**Width/Depth:**

1U: 16.9"/27.3" (29.5" with cable relief)  
429.3mm/693mm (749.3mm with cable relief)

**Weight, minimum:** TBD

### Power and Cooling

**Power input AC:** 90-264V AC, 50/60Hz

**Power input DC:** -40 to -75V DC

(1+1 redundant AC or DC, or both)

#### Power consumption, typical (400G channels):

DQT400-4 (4 port): 224W  
DQT400-12 (12 port): 472W

### Environmental

**Operating temperature:** 0 to 50°C

**Storage temperature:** -40 to 70°C

**MTBF:** TBD

**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