TrueFlex® Reconfigurable Optical Add-Drop Multiplexer (ROADM) Portfolio
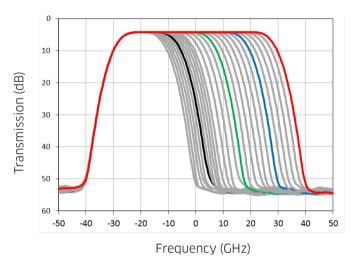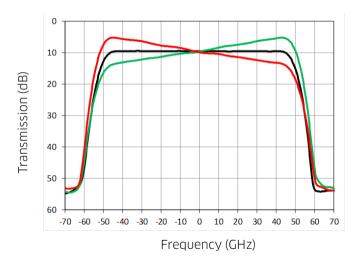
Telecom service providers are adapting their optical backbone networks to meet the demands of cloud networking and relentless video- and mobile-data traffic growth. Combined with a move to ultrahigh-capacity coherent transmission, highly-flexible ROADMs are key to their strategies.

Programmable optical channel width supports 37.5 GHz, 50 GHz, 75 GHz, or any arbitrary channel width
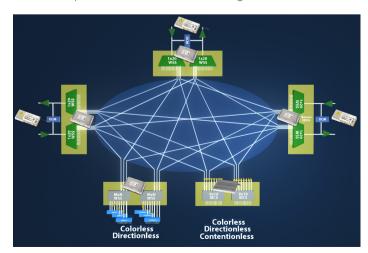

The TrueFlex WSS enables flexible intra-channel attenuation control for line power control and superchannel power balancing

Today's ROADM networks have served the industry well, but their limitations are constraining operators' plans for future growth. Broadcast-and-select architecture, hardwired fixed-wavelength arrayed waveguide grating (AWG) add/drops, and limited wavelength selective switch (WSS) port scalability do not offer the performance or network responsiveness now required. Channel turn-up and reprovisioning still require manual intervention; protection is still achieved with expensive transceiver duplication; and, data rate growth is constrained by fixed wavelength configurations. Carriers are looking to colorless/directionless (CD) and colorless/directionless/contentionless (CDC) ROADMs to extend their network flexibility.

A new, flexible ROADM architecture is emerging, enabled by the Lumentum TrueFlex ROADM portfolio. It incorporates a route-and-select configuration with a WSS in each direction—one each for mux and demux. This allows drop-path filtering and improves express-path isolation and loss for better network reach. For add and drop traffic, MxN WSS technology and multicast switching are optimized for CD and CDC respectively. ROADM architecture requires fully flexible spectral control and monitoring so that carriers can evolve to higher modulation formats and guardband-free superchannels for maximum system capacity and reach.

Hallmarks of a TrueFlex ROADM architecture include:

- Route-and-select WSS configuration for performance and node agility
- Optimized CD and CDC add/drop switching
- Flexible spectrum control and monitoring

The Lumentum TrueFlex ROADM portfolio includes these key building blocks to enable next-gen ROADM architecture :

TrueFlex Twin 1x20 WSS

• A key enabler for route-and-select node configurations and colorless flex-channel add/drop, the Twin 1x20 combines two independently controllable WSSs in a single compact form factor. Its high port count enables high-degree ROADMs, direct colorless add/drop port access, and extension to multiple add/drop switch peripherals such as an MCS or MxN WSS. The twin 1x20 is fully flexible-spectrum capable with a high-resolution optical design that is a key to network channel cascade without penalty. Its high isolation, low loss, and fine-granularity spectral control position this device for the most stringent long-haul and metro applications.

TrueFlex Twin MxN WSS

• The Twin MxN encompasses two independently controlled multiport WSS switches. With multiple inputs, the MxN can provide cost-effective CD add/drop switching, with one twin MxN device displacing the four MxN devices commonly used in this application. The MxN can be offered in any factory-set configuration with total ports (M+N) of 21 for each of the two devices. This product, based on identical hardware as the Twin 1x20, lets system integrators serve two applications with a single hardware integration and qualification cycle.

TrueFlex Optical Channel Monitor (OCM)

• TrueFlex OCMs are based on a high-speed scanning filter design with high resolution for flexible-spectrum applications. It is offered in single port, 2-port, and 4-port configurations. Multiport versions are able to scan all ports simultaneously for ultrafine network channel power control. High-resolution filter design is a key to high adjacent-channel accuracy and superchannel carrier discrimination and power monitoring. Finally, for fully flexible spectrum monitoring, TrueFlex OCMs report spectral power over any user-specified spectral range or provide continuous spectral density across the full C-band spectrum.

TrueFlex Twin 8x16 Multicast Switch

- The Twin 8x16 switch incorporates two independently controlled 8x16 multicast switches in a single compact package. It is used for contentionless add/drop, letting subtending transceivers tune to any wavelength and to any outbound direction without any wavelength blocking constraints. The product is implemented on the proven Lumentum PLC platform with best-in-class insertion loss, switch isolation, and switching speed.

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