

TrueFlex® Twin High Port Count Wavelength Selective Switch (Twin WSS)



The TrueFlex Twin WSS enables the introduction of colorless and directionless wavelength add/drop at optical network nodes. This minimizes provisioning constraints that increase the pre-deployment of capital and slow time-to-service. Built upon industry-leading Lumentum liquid crystal on silicon (LCoS) technology, the Twin WSS supports a fully flexible range of modulation formats and wavelength spacing to enable next-generation capacity growth for 100 G and beyond.

The Twin WSS integrates two discrete high-performance switching elements into a single compact package and control interface. Software control allows the WSS to be configured for 1xN connectivity to multiple express route “degrees” or for termination to both conventional direct-detect and next-generation coherent transceivers. Termination ports are colorless in both the drop and add directions, simplifying cabling and avoiding the need for manual reconfiguration.

Additionally, the Twin WSS provides attenuation control to allow dynamic balancing of power through the node and for channels being terminated. Various configuration options are available, including 1x20 and MxN ($M + N \leq 21$). A test access port (for example, 2x20) is provided to facilitate commissioning and troubleshooting.

TrueFlex capability means that the Twin WSS is also dynamically scalable to support higher transmission rates through the use of gridless spectrum and the accommodation of arbitrary modulation formats used for individual or super channels. Channel spacing and granularity can be adjusted in-service, at increments of 6.25 GHz or less. The Twin WSS also offers best-in-class spectral resolution to deliver excellent cascaded passband performance for unmatched scalability within the node and across the network.

The Twin WSS complements other products in the TrueFlex portfolio with a combination of colorless, directionless, and contentionless (CD/CDC) node attributes that drive flexibility and scalability while minimizing CapEx/OpEx for network providers.

Benefits

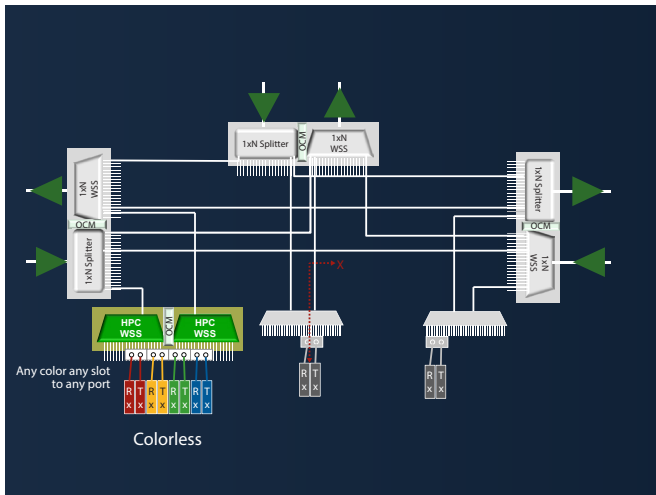
- Accelerate capacity delivery while reducing OpEx/CapEx with colorless and directionless add/drop
- Maximize flexibility and network efficiency with a highly-scalable route-and-select ROADM architecture
- Enable channel capacity beyond 100 G with TrueFlex gridless networking
- Minimize equipment footprint and power using industry-leading, compact module design
- Simplify control software for managing express and terminating channels with a single interface

Applications

Colorless Upgrade for Existing ROADM

The Twin WSS connects to an existing broadcast and select ROADM add/drop structure.

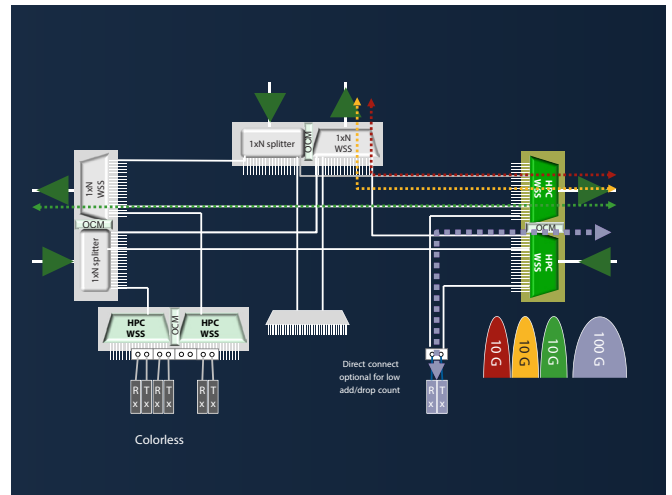
- Eliminate complex manual operations to match specific transponders to fixed ports
- Accelerate service delivery



Gridless ROADM Degree Upgrade

The Twin WSS overlays or replaces a line-side interface to allow broader channel widths than conventional fixed-grid.

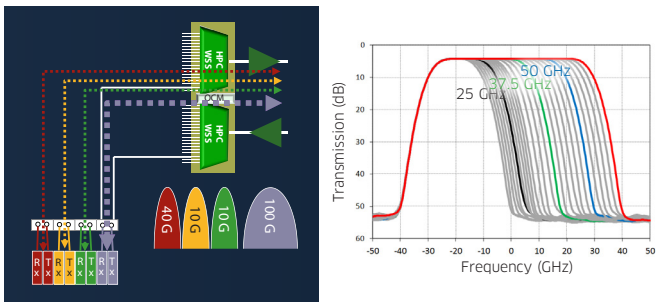
- Enable higher bandwidth channels using mixed modulation formats with gridless operation
- Provide colorless add/drop ports directly into the line, saving optical multiplexer cost and footprint



Gridless Multiplexing

The Twin WSS overlays or replaces a line-side interface to allow broader channel widths than conventional fixed-grid.

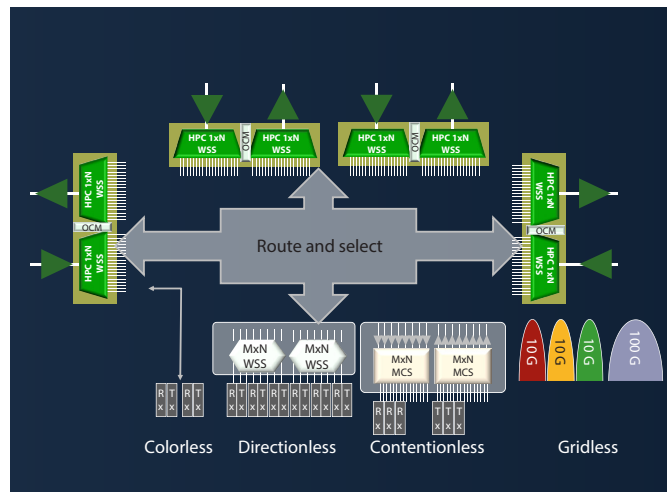
- Enable higher bandwidth channels using mixed modulation formats and spacing
- Support any mix of 10 G, 40 G, 100 G, super channels



Next Generation ROADM Route-and-Select Architecture

Multiple Twin WSSs connect together in a route-and-select ROADM architecture to allow any wavelength on any line direction to be terminated or expressed through the node with no constraints.

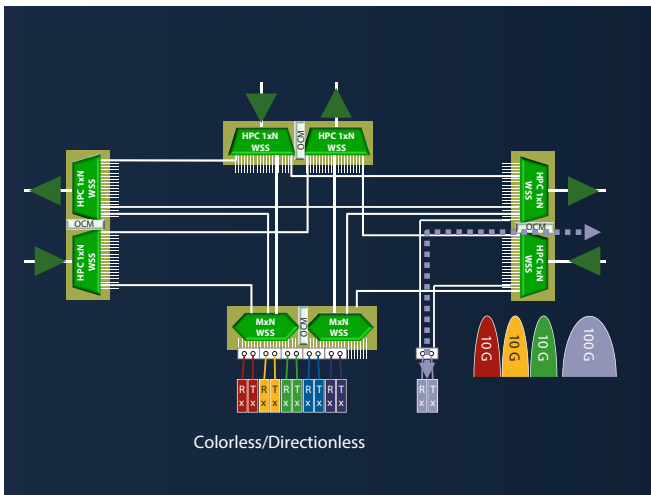
- Highly scalable to more degrees and more node transitions, with high port isolation
- Enables higher channel rates, multiple modulation formats, and super channels



Colorless, Directionless (CD) Add/Drop

Using an MxN configuration for terminating traffic allows any wavelength termination to be routed to any direction of the node during provisioning.

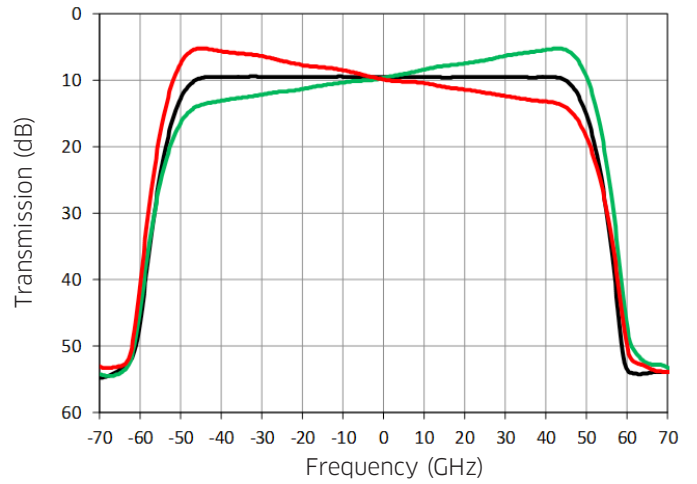
- Accelerate service delivery
- Eliminate manual operations to match specific transponders to fixed ports
- Reduce capital expenditure on dedicated transponder banks



Bandwidth-Enhanced Network

The Twin WSS provides excellent passband performance and allows fine-granularity control of power within each channel.

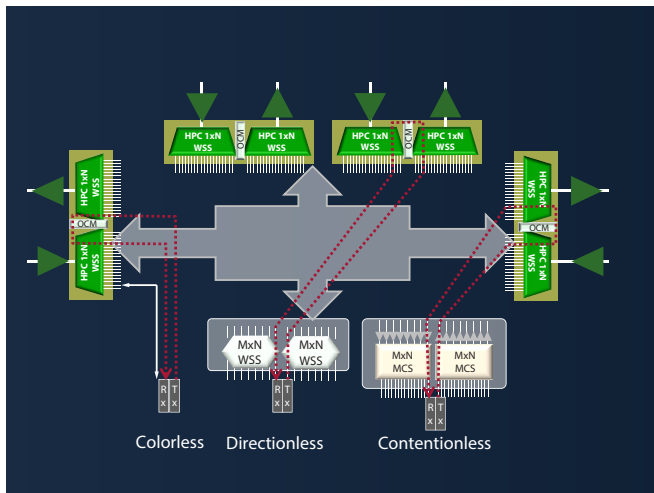
- Automatic bandwidth enhancement improves cascade performance
- Pre-shape channels mitigate gain tilt
- Correct individual sub-carrier power within a super channel to get uniform performance



Connectivity Verification

The Twin WSS has an additional bidirectional port (2x20) allowing rapid validation of connectivity.

- Connect a probe or loopback in-service
- Minimize equipment and manual operations during node commissioning and troubleshooting



Specifications

Parameter	Values
Port count	21 plus test access port; configurable MxN
Wavelength range	191.15 to 196.25 THz
Channel grid	ITU 100/50 GHz grid compatible or mixed TrueFlex gridless resolution to 3.125 GHz
Dimensions	37 x 140 x 212 mm (1.46 x 5.51 x 8.35 in)

The Twin WSS is qualified to Telcordia standards.



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