

# DWDM/CWDM Solutions Overview

A deep dive into the Smartoptics' solutions suite offered by OSI

## Open Line Systems

In an open optical network, DWDM transceivers may be embedded directly into the switches and routers, and their output signals then multiplexed onto the fiber by passive filters or a separate, active, open line system.

With an open architecture, the functionality of once monolithic optical transport systems can be disaggregated, using embedded transceivers, open line systems and SDN control, resulting in a much better price/performance.

Smartoptics has therefore developed the Dynamic Connectivity Platform (DCP) for active open line systems of all types, whether simple point-to-point links or advanced, ROADM-based, ring and mesh networks. To fit all the varying needs of an open line system, the DCP platform comes in three flavors – the DCP-M, the DCP-R and the DCP-F families – each optimized for a particular type of optical network.

## DCP-M

The DCP-M active open line systems work with any combination of embedded transceivers, transponder and muxponder traffic, creating flexible and future proof networks. Using DCP-M is exactly like using a passive multiplexer, but unlike a passive multiplexer it monitors the traffic, amplifies the signals for longer distances and can handle higher data rate protocols.

### Key features of the DCP-M

- Completely automatic optical setup, just like using a passive multiplexer
- Automatic fiber distance measurement and Dispersion Compensation setting
- Automatic modulation format detection
- Automatic client and line regulation
- Support for a mixture of up to 40 x 400ZR OIF, NRZ & coherent wavelengths
- Scalable and cost effective platform
- Modern management architecture
- Easily integrated into any network telemetry system
- The leading 1U Open Line System on the market

## DCP-R

The products in the DCP-R family can be deployed at all levels of the metro network, as well as in other applications where the flexibility and wavelength manageability of a ROADM is required. Applications range from 2-degree ROADM solutions for the metro access network up to 32-degree ROADM ring solutions for the metro/regional network as well as for meshed networks.

### Key features of the DCP-R

- Scalable and cost effective open line system
- Modern management architecture compliant with OpenROADM API
- Typically managed via the NetConf protocol
- Uses TransportPCE as an SDN controller
- Automatic detection of the optical characteristics of the fiber
- Support for a mixture of modulation formats such as 400ZR OIF, NRZ & coherent wavelengths
- Optimized for ring and mesh network topologies with up to 34-degree ROADMs
- Flex grid capable

## DCP-F

The DCP-F family members are designed for maximum configuration flexibility at the smallest possible footprint and one signal direction per unit. Most of the topologies required in both point-to-point and metro networks can be achieved by simply combining one or more DCP-F units per site. If required, supplemented with optional passive plug-in modules. To do so, interconnect the units and plug-in modules required for the site by patch cords at the front of the DCP-2 chassis to achieve the desired functionality.

### The first members of the DCP-F family

- The DCP-F-R22, a compact 1x2 ROADM including equalizer, amplifier and monitor and with room for two Passive Plug-in Modules (PPM).
- The DCP-F-A22, a dedicated EDFA amplifier with room for two Passive Plug-in Modules (PPM).
- The DCP-F-DE22, a dedicated EDFA amplifier including a 2-Port Optical Channel Monitor.
- PPM for an Optical Surveillance Channel (OSCM) OADM
- PPM for dispersion compensation
- PPM for a passive optical coupler

## Passive Optical Networking

The passive optical filters in multiplexers and OADMs combine and route wavelength channels onto an optical transmission fiber. Products for both indoor and outdoor use are included in the portfolio. The range of passive CWDM/DWDM multiplexers and OADM modules allow up to 18 CWDM and 80 DWDM channels to be connected simultaneously over a pair of dark fibers. They are completely protocol transparent and suit applications including 100/10G Ethernet, SDH/SONET, 32/16/8/4/2/1G Fibre Channel/FICON, FTTx and CATV.

The H-Series is a high density, cost-efficient platform for passive optical layer nodes such as CWDM and DWDM multiplexers/demultiplexers and OADMs (Optical Add Drop Multiplexer). Using best of breed components, the H-Series offers the latest generation of solutions to your passive optical networking needs. Special attention has been paid to cost, density and flexibility, resulting in a 1 RU chassis housing a variety of filter modules and giving you up to five times higher packaging density than previous solutions. The H-Series is fully compatible with the ITU optical grid and interconnects seamlessly with Smartoptics' transponder and muxponder product lines as well as with other vendors' products.

## Transponders

In configurations where it is not feasible or preferred to embed the transceivers directly in the switch, or when a demarcation point in an operator's network is needed, the DCP family of transponders is the ideal product for terminating the optical layer. At the heart of the platform is the DCP-2, a 1U chassis that houses two DCP modules.

### DCP-1203

The DCP-1203 offers a cost-efficient solution for 100G and 400G transport in a small form factor with low power consumption and low latency. It has three individual transponders on the same card. Each transponder can be used in 100G or 400G mode. The client side can use a flexible range of QSFP28 client types for 100G and QSFP-DD for 400G. The line side can use coherent DWDM 100GZR+, 400GZR and 400GZR+ QSFP-DDs.

### DCP-108

In 100G DWDM configurations where it is not feasible to embed the 100G QSFP28 transceivers directly in the switch, or when setting up a demarcation point in an operator's network, the DCP-108 eight channel open transponder is the ideal solution. Equipped with QSFP28 transceivers, the DCP-108 is the ideal transponder for terminating 100G services in a cost-efficient way at the subscriber premises.

## DCP-1610

The DCP-1610 is a high-density multilane transponder. Each DCP-1610 offers ten independent transponders operating from 1G to 16G line rates, enabling 20x DWDM channels per 1U (40x DWDM channel per 2U). 40G interfaces can be transported via 4x10G wavelength groups with support for CWDM or DWDM traffic.

## DCP-404

In 100G configurations where low-cost multiplexing and bandwidth utilization are important factors, the DCP-404 open muxponder is the ideal solution. Equipped with 400G OpenZR+ DWDM transceivers, the DCP-404 is the ideal product for multiplexing 100G services in a cost-efficient way at the subscriber premises.

## SoSmart Software Suite

SoSmart is a modular software suite for SDN-based management of Smartoptics products in an open, multi-layer and multi-vendor optical networking environment. The management suite has a new and modern software architecture with open APIs that enable a high level of management flexibility, modularity, multiple integration possibilities and openness.

The Smartoptics SoSmart Software Suite for open network management includes the following building blocks:

- SoSmart Manager – A management application for optical network provisioning, also including FCAPS functions and operated via an advanced GUI.
- SoSmart Controller – An open source SDN controller based on TransportPCE.
- SoSmart Planner – An optical planning and simulation tool with the same GUI as SoSmart Manager using open-source module GNPpy for path simulations.

## Optical Transceivers

OSI offers a full range of pluggable optical transceivers for rates from 100MB to 800G, in all applicable form factors (QSFP, CFP, XFP, SFP) and for Grey, CWDM and DWDM use. All the OSI optics have been certified in the Smartoptics platforms. In addition, the special Brocade Collection and Cisco Collection comprises a family of 32G/16G/8G DWDM Fibre Channel transceivers certified for embedded use by Brocade and Cisco. These enable lower cost solutions for FC SAN over distance (between data centers) compared with traditional DWDM systems.

