

# Dynamic Optical Layer

BTI 7000 Series



The BTI Dynamic Optical Layer—as an integrated component of the BTI 7000 Series packet optical platform—is a system-oriented network foundation. Combining reconfigurable optical add/drop multiplexing, reach extension, and end-to-end service- and path-centric management capabilities, the BTI Dynamic Optical Layer provides simplified operations and enhanced automation. The touchless and modular nature of the Dynamic Optical Layer architecture simplifies the design, installation, operation and optimization of agile metro service delivery networks.

## Dynamic Optical Layer Overview

The Dynamic Optical Layer consists of ROADM-on-a-Blade (ROB) modules for flexible, point-and-click wavelength routing, and DWDM Line Amplifier (DLA) modules for reach extension in an extremely compact form factor. The common control system, integrated on ROB and DLA modules, enables plug-and-play operation to simplify the planning, deployment, service provisioning, ongoing optimization, and power management of the network. These elements combine, as the system-oriented foundation of a packet optical service delivery network, to support a full-40 wavelength (400Gbps) system capacity and offers “any-wavelength anywhere” add/drop access, automated network equalization, and per-channel performance monitoring metrics.

The system-oriented nature of the Dynamic Optical Layer allows communication between modular elements with an integrated Optical Service Channel (OSC). Via the OSC, modular elements share information and automatically measures span loss, adjusts the system gain, and leverage a multi-span feedback loop that enables per-channel pre-emphasis to address wavelength tilt and fiber non-linearities. The solution also provides end-to-end channel performance metrics that supports comprehensive service visibility and enables rapid network troubleshooting. In addition, the OSC enables turning up the optical layer without any service wavelengths, additional bandwidth for nodal management, accurate span measurement, and robust optical shutdown capabilities.

The Dynamic Optical Layer’s dispersion management strategy compensates for dispersion following each span – in this way, express wavelength and new wavelengths on a network span are launched with no residual dispersion. In this way, optical performance is optimized and maximum reach of all wavelengths is achieved.

## Features

**4th Generation Technology:** leverage recent innovations and efficiencies providing an extremely flexible—and future-proof—packet optical service delivery network foundation.

**System-Oriented Approach:** common control system consolidates per-wavelength performance across the whole system simplifying planning, provisioning and on-going optimization and power management with automated capabilities.

**Optimized for Metro Aggregation:** cost- and form-factor optimized to enable deployment in metro aggregation applications where reconfigurability and access to any channel is important to address evolving customer demands.

**Gridless Networking:** supports 50GHz, 100GHz, plus arbitrary channel spacing to accommodate future channel capacities (greater than 100Gbps) alongside 10Gbps, 40Gbps, and 100Gbps services today.

**Zero Channel Turn-Up:** integrated OSC enables element auto-discovery, sharing of span information, and automated setting of power levels ensuring the network’s ready to serve before a service is deployed.

## ROADM-on-a-Blade (ROB)

ROADM-on-a-Blade (ROB) modular elements provide per-wavelength path switching and power equalization. ROB modules offer access to all 40 channels on each path/degree and services can be delivered to any port within the network with point-and-click simplicity that limits operational effort and reduces network operating costs.



2 Degree ROADM-on-a-Blade



4 Degree ROADM-on-a-Blade

The Dynamic Optical Layer offers both 2-degree ROB (ROB2) and 4-degree ROB (ROB4) elements that provide point-and-click add/drop/express provisioning for flexible ring design, and per-channel equalization that can extend optical reach. In addition, the ROB4 enables fully optical interconnect between rings.

ROB elements integrate a post-amplifier, 2-stage pre-amplifiers, common control system functionality, an optical channel monitor, and Wavelength Selectable Switch (WSS) functionality into a single module. Integrating these elements within ROB modules simplifies cabling, limits configuration errors, offers low power consumption, and reduces sparing requirements.

### DWDM Line Amplifier (DLA)

DWDM Line Amplifier (DLA) modular elements are engineered to streamline the design, deployment and operation of the optical layer. The amplifiers are fully plug-and-play, and designed to auto-configure power levels and tilt when powered on. DLA elements integrate a pre- and post-amplifier, advanced control capabilities as part of the common control system, and management connectivity within a single slot. DLAs continuously monitor the line and adjust power levels as needed and interoperate with ROB elements to ensure end-to-end wavelength control across the entire network.



DWDM Line Amplifier (DLA)

### Flexibility, Simplicity, and Responsiveness where it's needed.

The Dynamic Optical Layer leverages recent technology innovations and efficiencies. Optical switching technology enables future in-service software upgrades to support 80 wavelengths at 50GHz spacing. 4th Generation ROADM technology enables arbitrary ("gridless") wavelength spacing definition that enables network operators to accommodate 400 Gbps or 1 Tbps transmissions that require a wider channel width than current ITU standards call for—and can do so alongside 10G, and 40/100G services without wasting spectrum. Cost-optimizations—and a compact form factor—enable deployment in metro aggregation settings (closer to the network edge) where reconfigurability and access to any channel is important to address evolving customer demands.

	2-Degree ROADM-on-a-Blade (ROB2)	4-Degree ROADM-on-a-Blade (ROB4)	DWDM Dual Line Amplifier (DLA2)
Wavelength Range			
1528.77nm - 1563.05nm	■	■	■
Span loss	0 to 35dB	0 to 35dB	0 to 30dB
Monitor port			
Pre-amp	■	■	■
Post-amp	■	■	■
Number of channels			
40 channels (100GHz)	■	■	■
80 channels (50GHz)	(future release, software-enabled)	(future release, software-enabled)	(future release, software-enabled)
40/100Gbps support	■	■	■
Integrated OSC	■	■	■
Per-wavelength control	■	■	
Power Consumption	65W	65W	40W
Environmental			
-5 to 55C	■	■	■
Product Code	BT7A07AA	BT7A07BA	BT7A06CA
Module Dimensions	Double (2Wx1H)	Double (2Wx1H)	Single (1Wx1H)
Supported Platforms			
BTI 7060	■	■	■
BTI 7200	■	■	■