

# Optical Services Transport Platform

## Metro and Ultra-long-haul DWDM System



### Features

- ▶ Transmits OTN OTU1/2/3/4, SDH STM-1/4/16/64/256, 1/10/100GE using FEC, EFEC
- ▶ Secure GE Communication Connectivity to Each Node via an Independent Wavelength Channel and Integrated Ethernet Switching
- ▶ Industry's Highest Power Optical Amplification Capability Enables Unrepeated Span Lengths up to 400 km
- ▶ Supports Industry Standard Laser Safety Protection with Independent and Redundant Fault Detection



### Applications

- ▶ Metro Network Backhaul
- ▶ Submarine and Underseas Networks
- ▶ CLEC, Electric Utility, Transportation, Pipeline and Private Networks
- ▶ SCADA and Telemetry Transport

The Optical Services Transport Platform (OSTP) is a Dense Wavelength Division Multiplexing (DWDM) transport system designed for transmission of multiple wavelengths over a single optical fiber, such as G.652, G.654 and G.655. The system is ideally suited for Ultra Long Haul (ULH) optical networks. The OSTP system supports amplified optical outputs and the C3 ITU Grid wavelength range and includes a full range of transponders, muxponders, fiber amplifiers and Raman pump lasers.

The OSTP transponders and muxponders, including the 100 Gb/s and 40 Gb/s versions are designed in-house and are enabled by proprietary System on a Chip (SoC) engineering design competency requiring Very Large Scale Integration (VLSI). The SoC design includes Forward Error Correction (FEC) based on ITU G.709 and supports coherent receiver detection. IPG also designs and manufactures the core fiber-laser-based amplification technology including the Pump Laser Diodes (PLDs), active fiber and fiber Bragg gratings that comprise some of the highest power



optical amplification solutions available on the market. IPG's industry-leading single mode PLD power density supports up to 2 Watts of composite amplification power in a compact, blade-mounted EDFA module for DWDM applications.

#### Industry Leading Optical Amplification

The OSTP system solves long distance optical transmission challenges including eliminating optical repeaters and regenerators from spans with over 100 dB of optical budget. IPG's OSTP extends the capabilities of IPG's optical amplification and transmission portfolio into a next-generation platform capable of transmitting Terabits of information over Ultra-long-haul distances in a state-of-the-art, compact design.

IPG Photonics' vertically integrated manufacturing process is unique to optical amplifier suppliers. IPG is the only company that controls the performance, cost and yield of both active fibers and semiconductor pump diodes- the core technology of our fiber laser and amplifier products. This enables IPG to produce some of the highest power optical amplifiers in the world and with very low Noise Figures.

#### Flexible Deployment Options

The primary shelf for the system is 482 mm (19") wide by 354 mm (14") high (8RU) designed for installation in racks and equipment cabinets. Each shelf supports up to 16 "blade" units (Transponders, EDFAs) as well as a single passive optics unit, two power supply units and a control unit.

# Optical Services Transport Platform

## Metro and Ultra-long-haul DWDM System

The 2 Rack Unit (2RU) version of the ULH system is an economical companion to the 8RU, 16 Input/Output (I/O) slot shelf. This compact shelf has 4 I/O card slots and accommodates any combination of 4 OSTP I/O blades including transponders and optical amplifiers.

### Laser Safety

The OSTP system has a powerful Laser Safety feature based on the requirements of IEC 60825-2 which requires the detection of a hazard condition in single fault conditions as well as via redundant paths. Safe hazard levels are maintained under all conditions in applications requiring a Class 1M laser safe hazard level. The APR versions of the FEC transponder and the OSC transponder monitor their respective payload and initiate a control signal to regulate the co-located amplifier emission power levels to operate at a Class 1M hazard level, as defined by IEC 60825-2.

### GE Connectivity to Each Node

The OSC transponder uses an independent wavelength and incorporates an Ethernet Switch that provides an independent, clear channel Ethernet communication path to the Control Unit in the OSTP shelf to access the control, inventory and alarm functions in the shelf.

### SNMP Management

The management of the ULH DWDM system is based on a client-server architecture. The control unit in each shelf is the "server", where the SNMP agent, HTTP agent and the system MIB reside. A 100 Bt connection on the CU provides MIB access. The client can be either or both of an EMS and/or NMS. The EMS is enabled by a standard web browser and communicates via an HTTP connection to the Control Unit. The NMS can be based on the Castle Rock SNMPc 7.2 Enterprise Edition platform and communicates via SNMP with the Control Unit.

### Environmental Specifications

Operating Temperature:  
+5°C to +40°C/ +41°F to +113°F Long Term Ambient  
Operating Humidity:  
5% to 80% Non-condensing  
Power:  
Redundant-48 VDC feeds (-36 VDC to -72 VDC range)  
Maximum 350 W Power Consumption (fully loaded)

### Transponder/Muxponders

Transponder, STM1/ 4/ 16, FEC insertion, Optional APR control, Optional Dual Operation  
Transponder, 2.5G, 17 dBm output, Optional Low Dispersion  
Transponder, 10G, FEC  
Muxponder, OTU1/2.5G Line, 4xSTM4 or 2xGE Client  
Muxponder, OTU2/10G Line 4x2.5G or 8xGE Client  
Muxponder, OTU3/40G Line, 4xSTM64/ 10GE/ OTU2 Client  
Muxponder, OTU4/100G Line, 10xSTM64/ 10GE/ OTU2 Client  
Transponder, OSC, APR control, Optional GE Clear Channel SFP, 1000BASE-T, DWDM ch 31 and ch 33

### Amplifiers- EDFA, Raman, ROPA

EDFA, Booster, Line or Pre-amp with Optional Mid-stage Access  
EDFA, Pre-amp + Booster, Optional OSC Support  
Raman, 1455 nm, 0.5W – 3.2W, Optional APR  
Raman, 1390 nm/ 4.0W, 1480 nm/ 0.1W, Optional APR  
ROPA, In-line BWD and FWD Pumping  
ROPA, Single External BWD and FWD Pumping  
ROPA, Dual External BWD and FWD Pumping  
ROPA Amplified Spontaneous Emission (ASE) Filter

### Mechanical and Ancillary Units

Shelf, 19", 8U, 16 slot  
Shelf, 19", 2U, 4 slot, Control Unit, 48 VDC  
Control Unit with NMS/ EMS server  
Power Supply, DC, 350 W  
Alarm Dry Relay Contacts, 8 Input/4 Output  
Alarm Shelf, Audible and Visual  
Optical Add/ Drop Multiplexers  
Dispersion Compensation Units

+1 (508) 373-1100  
telecom.us@ipgphotonics.com

[www.ipgphotonics.com/telecom](http://www.ipgphotonics.com/telecom)

**Legal notices:** All product information is believed to be accurate and is subject to change without notice. Information contained herein shall legally bind IPG only if it is specifically incorporated into the terms and conditions of a sales agreement. Some specific combinations of options may not be available. The user assumes all risks and liability whatsoever in connection with use of a product or its application. IPG, IPG Photonics, The Power to Transform and IPG Photonics' logo are trademarks of IPG Photonics Corporation. © 2009-14 IPG Photonics Corporation. All rights reserved.

**The Power to Transform®**