

LASERPLUS

1GHz HIGH DENSITY COMPACT CATV OPTICAL TRANSMISSION SYSTEM



Features / Benefits

- **Compact:** Space-Efficient 3RU footprint means that up to 13 chassis can be installed in a standard 70" rack
- **High Density:** Up to 15 applications modules per 3RU 19" EIA chassis; 195 modules per 70" rack
- **Scalable:** Full lineup of application modules optimizes virtually any CATV system architecture, from traditional 4:1 "blast-and-split" HFC configurations to newer topologies with 1:1 forward path segmentation
- **High Performance Fwd 1310nm Transmitters:** 3dBm to 15dBm outputs @ 1310nm; 195 per 70" rack
- **Triple Return Receivers:** Up to 45 fully independent 1310/1550nm receivers per chassis; 585 per 70" rack
- **Other Modules:** 1550nm Fwd FTTP Tx; CWDM/DWDM R-Tx; DWDM QAM Tx; Block Down Converter
- **Return Path Segmentation:** via 2:1 or 4:1 (5-42/65 MHz) block downconverters; Field-proven since 1999
- **Remote Monitoring and Control:** Optional network management interface supports SNMP via Ethernet port
- **Local Status Monitoring:** Rear chassis DB-25 connector outputs individual module summary alarms via contact closures, and LEDs on each module indicate general operating status & key operating parameters
- **Convenient Test Points:** Optical and RF test points are located on the front panel of each module
- **Powering Redundancy:** Fully independent, universal 90-264V_{AC} and/or ±48V_{DC} power supplies
- **Power Efficiency:** < 150 Watts per fully-loaded chassis; Runs cooler, reduced power costs & longer life
- **Thermal Efficiency:** Four hot-swappable fans in chassis plenum creates more airflow than module-based fans
- **Integrated Fiber Management Tray:** Inside the chassis, above and in front of the application modules
- **Plug-in, Modular Front-Access Design & Hot-Swap Module Capability:** Easy replacement & configuration
- **Very Cost-Effective**



The **OLSON TECHNOLOGY, INC. LaserPlus Model LP-x** is a compact, high density optical transmission system which allows hub, headend and digital transport to coexist on a single, scalable platform. It provides the outstanding performance, system design flexibility and scalability in almost any network architecture from traditional Hybrid Fiber Coax (HFC) to the newer fiber-deep Targeted Service Delivery

(TSD) area topologies. As such, the **LaserPlus** is the ideal platform for the transport of evolving services and resultant expanding bandwidth requirements in today's advanced HFC and PON networks.

The three (3) rack-unit **LaserPlus** chassis accepts up to fifteen "mix-and-match" applications modules and single or dual redundant independent power supplies (AC or DC), minimizing headend space requirements. This fully-integrated, cost-effective package utilizes many of the very latest RF and optical design techniques to provide superior system performance to beyond 1,000 MHz, while dramatically reducing component size and minimizing system powering requirements, and the costs normally associated with them.

The **LaserPlus** transmission platform is the perfect companion to optical receiver/node products in the Olson Technology, Inc. **MetroNode Model OTMN-II** and **PremiseNode Model OTPN-x** product families, but is also designed to operate seamlessly with optical transmitters, receivers and nodes from most leading manufacturers.



Model LP-OT-
Single
Transmitter
Module

Forward Optical Transmitter

The OT LaserPlus Forward Path Broadband Optical Transmitter is based on a completely new and revolutionary design. It utilizes a high quality, optically isolated 1310 nm DFB laser with an average output of +6 dBm, engineered specifically to meet new requirements for a one transmitter per one (or two) node system design. This architecture, being implemented by an ever-increasing number of MSO's in metropolitan area applications, assumes a short (< 10dB) optical path from headend to node. This approach is gaining popularity for two reasons: (1) 80-90% of system nodes are typically within 7 dB (20 km) from the headend or hub, and; (2) the need to reduce subs/node size.

It is an excellent system companion to the Olson Technology, Inc. family of OTPN-1000, OTON-II or OTMN-II OpticalNode/Receivers. The design of the unit eliminates cumbersome setup and requires only a simple gain adjustment to bring the unit online. The transmitter has a full 50-870 MHz bandwidth and meets the industry requirements to be able to carry standard analog signals plus digital tiers, Internet traffic, telephony and video-on-demand (VOD).

The unit has front panel indicators which provide immediate visual status of the unit. It also includes a 75 ohm front panel test point for ease of monitoring. The standard SC/APC optical connector has a protective flip-up cover which provides full protection when the connector is removed or not in place.

NOTE: output power available in 6, 8, 10, 12, 14, 15 dBm



Model LP-OR-300
Three Receiver Module

Return Optical Receiver

The OT LaserPlus Return Path Broadband Optical Receiver provides a very high density package for handling return path signals. It also features superb technical performance to facilitate carriage of critical data, telephony and internet traffic.

The receiver module provides three return receivers per unit, grouping up to 45 return signals in just 3 RU (5.25") of rack space. The unit has front panel indicators which immediate visual status of each of the three receivers in the unit. It also includes a 75 ohm front panel test point for ease of monitoring. The standard SC/APC optical connectors have a protective flip-up cover which provides complete protection when the connector is removed.

The receiver design utilizes a new, high efficiency 1310/1550 nm photo detector and advanced RF circuitry. The optical input range accepts optical input levels from -17 dBm to 0 dBm without the need for padding the optical input or using different modules with varying input ranges.

The receiver has a wide bandwidth of 5-300 MHz, assuring the ability to handle a variety of return signals . Using Noise Power Ratio (NPR) as the criteria for return path performance, the OT LaserPlus Receiver has high NPR with wide dynamic range (NPR of >41 dB with a Dynamic Range of >15 dB).

High Density Optical Transmission System Specifications

LaserPlus Chassis Model OT-LP

Powering	95 – 250 VAC, <150 Watts
Operating Temperature	0° C to +45o C
Humidity	to 95% non-condensing
Dimensions	5.25" H x 19" W x 14.5" D 13.3 cm x 48.3 cm x 36.8 cm
Weight	
Chassis	10 lb. (4.54 kg.)
Power Supply	1.0 lb. (0.454 kg.)
Transmitter	1.5 lb. (0.7 kg.)
Receiver	1.0 lb. (0.454 kg.)

LaserPlus Return Optical Receiver Model LP-OR-300

Optical

Optical Wavelength	1290 to 1600 nm
Optical Receiver Power	-17 dBm to +3 dBm
Equivalent Noise Current	<7 pA/Hz
Optical Connector	SC/APC standard, FC/APC optional

Electrical

Frequency Range	5 MHz to 300 MHz
Frequency Response	± 0.75 dB
Output Impedance	75 ohms
Output Return Loss	>15 dB
RF Output Level	+35 dBmV @ -14 dBm optical or greater @ 10% modulation index
Output Level Adjust	Front panel control to set constant output level for Optical input from -14 dBm to 0 dBm.
Output Test Point	-20 dB, ±1 dB
RF Output Connectors	Type F

Performance

Noise Power Ratio (NPR)	>41 dB
NPR Dynamic Range	>15 dB
Isolation between Receivers	>65 dB

Measured with OT DFB 3mW Return Transmitter and 10dB fiber link.

LaserPlus Forward Optical Transmitter Model LP-OT-6

Electrical

Input Frequency Response	50 MHz to 870 MHz
Input Impedance	75 ohms
Input Return Loss	>16 dB
RF Input Level	
Analog	+18 dBmV/Carrier to 550 MHz
Data Loading	from 550 to 870 MHz @ -6 dB/Channel, +9 dBm
RF Level Adjust	+4 dB (to +22 dBmV/Carrier)
Gain Variation	<±1 dB
Output Test Point	Laser Drive Level -20 dB

(Note: All RF Input Level Specifications are based on unmodulated carriers. Typical modulated carrier input will be 2 dB higher)

Optical

Optical Wavelength	1310 nm, ±20 nm
Optical Output Level	3.5mW Minimum, 4.0mW Typical
Optical Connector	SC/APC standard, FC/APC optional

Performance (unmodulated carriers @ 0 dBm input)

Carrier-to-Noise	(C/N) >51 dB typical,
Composite Second Order (CSO)	>61 dB typical,
Composite Triple Beat (CTB)	<-67 dBc typical
Cross Modulation (XMOD)	<-65 dBc, typical

NOTE: output power available in 6, 8, 10, 12, 14, 15 dBm

Specifications subject to change without notice.