

Features and Benefits

- Low-Cost Direct Modulated (DM) 1550nm analog optical transmitter alternative to conventional Externally Modulated (EM) LiNO₃ optical transmitters for deployment in CATV HFC -or- FTTP AON/PON multichannel large-scale distribution applications
- 48 - 1,000MHz available RF bandwidth for CATV analog & digital multichannel transport
- Electronic SBS dispersion compensation and advanced pre-distortion circuitry enables full analog and digital QAM loading while minimizing second-order and third-order distortions
- +8dBm or +10dBm optical output drives multiple EDFAs in short-haul (0 - 10km) apps
- Also accommodates optical loss budgets up to 14 dB (or up to 10km) without an EDFA
- Optimized for fiber distances of 0 - 10km (-FF)
- (12) ITU-grid wavelengths @ 100 GHz spacing available; Standard 1550nm $\pm$ 10nm option available for non-DWDM, CATV HFC and FTTP AON/PON deployments
- Simple initial set-up; Front Panel RF & Optical Test Points & LED Alarms
- Energy-efficient circuit design = Low Power Consumption & Long-Term Reliability
- Single-slot width, plug-in, front-access module with hot-swap capability, slides into one of the fifteen (15) available applications slots in the LaserPlus LP-CH-16A Chassis
- Chassis-based plenum with four large fans creates more airflow & better reliability than module-based fans; if fan-failure occurs, transmitters remain in operation

The Olson Model LP-OT-FF 1550nm 1GHz FTTP/CATV Broadcast Transmitter is a single-slot module for the LaserPlus optical transmission platform. Its revolutionary design was specifically engineered for optical transport of analog and digital QAM broadcast signals in traditional CATV Hybrid Fiber Coax (HFC) applications, as well as for newer Fiber-to-the-Premise (FTTP) deployments using Active/Passive Optical Network (AON/PON) architectures. Specifically, this transmitter was designed for high power, one-transmitter-to-multiplexer (up to 1:1024 ratio) point-to-point (P2P) AON and point-to-multipoint (P2MP) PON system topologies. Each transmitter's +8dBm or +10dBm optical output can directly feed up to sixteen (16) remote HFC nodes/receivers (via 1x16 optical coupler) or can also be split externally (1x2, 1x3 or 1x4) to drive EDFA fiber amplifiers subsequently feeding up to 1,024 homes with multichannel CATV-style video and/or data. In this scenario, each transmitter feeds up to four 8-port EDFA's, such as the Model OTEA-CO-B-816-SA, for large-scale distribution of broadcast broadband signals in short-haul FTTP applications, with maximum runs of up to 10km of standard SMF-28 single-mode fiber, or up to 25km of 1550nm low dispersion (NZ-DSF) optical fiber. (NOTE: This unit is NOT suitable for long-haul CATV trunking applications).

The rugged, low-profile Model LP-OT-FF transmitter utilizes a next-generation directly-modulated (DM), high-quality, low-chirp, optically isolated DWDM laser with a single +8dBm or +10dBm optical output. A DM 1550nm transmitter, such as the LP-OT-FF achieves a high level of performance, similar to that of EM sources (but at < 30% of the cost of comparable EM transmitters), making it an attractive choice for today's FTTH & CATV deployments.

The unit is packaged as a convenient, hot-swappable plug-in module, and features an RF driver, integrated laser cooler circuitry, advanced dispersion compensation with predistortion electronics, front panel RF and optical test points, and front panel LED's which provide immediate visual status of the unit. The design of this transmitter also facilitates initial setup by requiring only a simple RF input gain adjustment via easily accessible front panel variable PIN attenuator to bring the unit online. Enhanced local and remote monitoring of this transmitter is also provided via summary alarms to LED's on the Model LP-PS-x power supplies, via contact closures on the Model LP-CH-16A chassis, and additionally via the optional Model LP-CH-SNMP-1 element manager interface which is compatible with third-party remote status monitoring and control solutions.

The LaserPlus Model LP-OT-FF is the perfect companions to EDFA's and optical receiver/node products from Olson Technology, Inc., like the LaserLite OTEA-CO & OTEA-CM series, the MetroNode Model OTMN-x and PremiseNode Model OTPN-x product families. It is also designed to operate seamlessly with EDFAs and optical receivers &/or nodes from most leading manufacturers. Note that only EDFA's rated to operate with DM transmitters can be used.



Specifications

RF & LINK PERFORMANCE PARAMETERS:	
Frequency Range	48MHz to 1,000MHz
Frequency Response	±1.0dB
Input Impedance	75 Ohms
Input Return Loss *	> 15dB
Input Level, Nominal	+15dBmV/ch (79 NTSC chan) + 320MHz Digital @-6dB (+9dBmV/ch)
Distortion Performance *	CNR > 51 dB CSO > 55 dBc (@ 0 - 5km); > 53 dBc (@ 0 - 10km) CTB > 60 dBc
* Typical: Measured with 3.2% OMI, 0dBm input to Olson Model# OTPN-400 reference receiver	
OPTICAL PARAMETERS:	
Wavelength	ITU channels 18 to 29 @ 100 GHz(0.8 mm) spacing
Wavelength Accuracy	±0.1nm
Output Power	+8dBm / 6mW or +10dBm / 10mW
SBS Threshold (with RF Applied)	>+10dBm
ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS:	
Dimensions	4.5" H x 1.125" W x 8.75" D (11.4 cm x 2.9 cm x 22.2 cm)
Weight	1 lb. (0.454kg)
Operating Temperature Range	0°C to +50°C (+32 to +122°F) (Air temperature measured at air inlet of Model LP-CH chassis)
Humidity Range	to 95% non-condensing (Recommended for use only in non-condensing environments)
Mounting	Inapplications slot in Model LP-CH-16A LaserPlus Chassis
Module Slots	One slot width: Slot# 1-15 (inclusive)
Powering	5.25 V _{DC} per module
TRANSMITTER INTERFACES:	
RF Input Connector	F-Type (rear of module)
RF Input Test Point(F-Type Connector)	+10dBmV/carrier @ 550MHz for optimal OMI & performance
Input Level Adjust	+4dB via variable attenuator (front of module)
Optical Output Connector	SC/APC standard; FC/APC optional (front of module)
LED Indicators(Green/Red)	Optical Power Alarm; Laser Current Alarm; Cooler Alarm data sheets.
Ordering Information	
Model No.	Description
LP-OT-08-A-FFxx-SA	LaserPlus FTTH 0-10km Tx ; 48-1,000MHz; +8dBm/6mW; SC/APC
LP-OT-10-A-FFxx-SA	LaserPlus FTTH 0-10km Tx ; 48-1,000MHz; +10 dBm/10mW; SC/APC
	xx = DWDM ITU-Grid Channels 18 - 29 (i.e. xx = 25 for 1557.36 nm) 00 = Standard 1550nm ± 10nm (non-DWDM) (Channels 18 - 29 = 1563.05nm - 1554.13nm)
For LaserPlus Chassis & Power Supply information, refer to the corresponding LP-CH-16A and LP-PS-x	



1 GHz HIGH DENSITY COMPACT CATV OPTICAL TRANSMISSION SYSTEM Triple Return Path Receiver (LP-OR-300)

Features and Benefits

- Three independent optical receiver inputs per module for use in the LaserPlus 3RU chassis
- Available in Triple, Dual, Single, w/ABS and Dual w/WDM R-Rx configurations
- High Module Density: up to 45 upstream receivers in a only 5.25" rack space
- Suitable for high performance/high capacity return path digital and video requirements
- 5-300MHz upstream transmission bandwidth for the most demanding applications
- 1290nm to 1610nm wavelength accepts 1310nm, 1550nm, CWDM and DWDM
- High RF output @ wide optical input range: +35dBmV @ +3 to -14dBm
- Front Panel Optical Input test points via high-impedance voltmeter
- Front Panel status LEDs: Optical Input power summary alarm for each receiver
- Front Panel RF test point (-20dB) monitors RF output of each receiver
- Simple Plug-and-Play initial set-up: Adjust receiver for RF output gain level and GO!
- Energy-efficient internal circuit design for low power consumption & long-term reliability Single-slot width, plug-in, front-access module with hot-swap capability, slides into one of the Fifteen
- (15) available applications slots in the LaserPlus LP-CH-16 Chassis
- Chassis-based plenum with four large fans creates more airflow & better reliability than module-based fans; if fan-failure occurs, transmitters remain in operation

The ANTRONIX Model LP-OR-300 1310/1550nm Return Path Optical Receiver Module is a triple optical receiver module containing up to three (3) independent upstream receivers for the LaserPlus optical transmission platform. It was engineered to meet the requirements for a high-density solution for advanced services return path video and data traffic. As such, the LaserPlus chassis can group up to 45 upstream signals in just 3RU (5.25") of rack space, or up to 585 receivers in a standard 70" rack. It is available in a variety of configurations, including: triple, dual, single, dual with A/B switch and dual with integrated WDM.

The rugged, low-profile, high-efficiency receiver design utilizes a new, high efficiency 1310/1550nm photodetector and advanced RF circuitry. The unit's wide optical input range accepts optical input levels from -17dBm to +3dBm without the need for attenuating the optical input or using different modules with varying input ranges. Performance-wise, each receiver delivers wide 5-300MHz bandwidth and superior performance (NPR of >41dB with Dynamic Range of >15dB).

Three (3) high isolation, independent receivers are packaged into a convenient, hot-swappable plug-in module, which features front panel RF (-20dB) and optical input test points, and front panel LEDs which provide immediate visual status of the unit. Individual receivers in the module can be disabled if three independent inputs are not available. Enhanced local and remote monitoring of the receivers is also provided via summary alarms to LEDs on the Model LP-PS-x power supplies, via contact closures on the Model LP-CH-16 chassis, and additionally via the optional Model LP-CH-SNMP-1 element manager agent which is also compatible with third-party solutions.

The LaserPlus Model LP-OR-300 is the perfect companion to optical receiver/node products in the ANTRONIX MetroNode Model OTMN-x and PremiseNode Model OTPN-x product families, but is also designed to operate seamlessly with optical transmitters, receivers and nodes from most leading manufacturers.



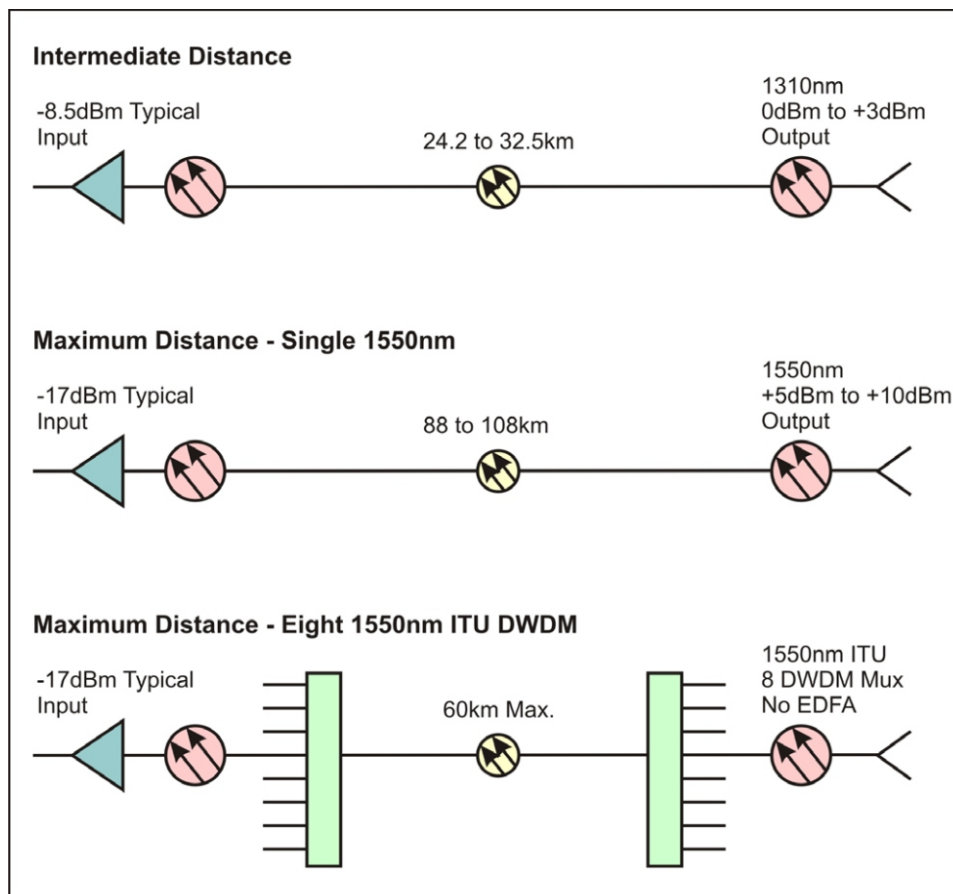
1 GHz HIGH DENSITY COMPACT CATV OPTICAL TRANSMISSION SYSTEM

Triple Return Path Receiver (LP-OR-300)

The LaserPlus Model OT-OR-300 Triple Return Path Receiver, combined with a suitable 1310nm return transmitter, provides a complete link over 50km with a full 5-300MHz bandwidth and performance specification suitable for use with upstream video and data signals. This facilitates a return link which is fully compatible with link optical budgets used in 1550nm forward transmission systems.

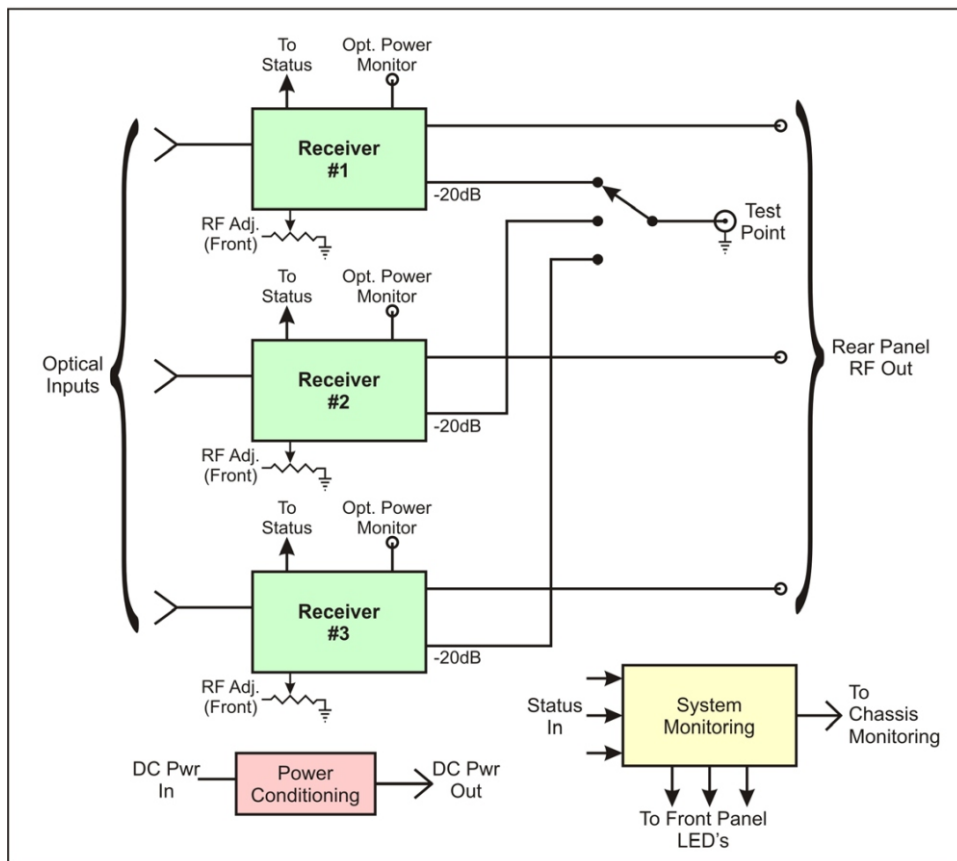
Since the receiver uses a dual optical window photodetector, the unit can also be deployed as the receiving end of a 1550nm standard, 1550nm CWDM or 1550nm ITU-DWDM return path system. Link budgets available with these types of architectures can accommodate to over 100km.

Typical Applications of the LaserPlus Model LP-OR-300 Triple Return Path Receiver



1 GHz HIGH DENSITY COMPACT CATV
OPTICAL TRANSMISSION SYSTEM
Triple Return Path Receiver (LP-OR-300)

Block Diagram of the LaserPlus LP-OR-300 Triple Return Path Receiver



1 GHz HIGH DENSITY COMPACT CATV OPTICAL TRANSMISSION SYSTEM Triple Return Path Receiver (LP-OR-300)

Specifications

RF INPUT & PERFORMANCE PARAMETERS:	
Frequency Range	5 MHz to 300 MHz
Frequency Response, peak-to-valley	+/- 0.75 dB
Frequency Response Slope	+/- 1.0 dB
Output Impedance	75 ohms
Output Return Loss	> 15 dB
RF Output Level	+35 dBmV @ -14 dBm optical or greater @ 10% modulation index
Performance	Noise Power Ratio (NPR): > 41 dB * NPR Dynamic Range: > 15 dB * Isolation between Receivers: > 65 dB * <i>* Measured with Olson 3mW DFB return optical transmitter & 10dB fiber</i>
OPTICAL PARAMETERS:	
Wavelength	1290nm to 1600nm
Input Receive Power	-17 dBm to +3 dBm
Equivalent Noise Current	<7pA/Hz
ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS:	
Dimensions	4.5" H x 1.125" W x 8.75" D (11.4 cm x 2.9 cm x 22.2 cm)
Weight	1 lb. (.454 kg)
Operating Temperature Rang	0 degrees C to +50 degrees C (+32 to +122 degrees F) (Air temperature measured at air inlet of Model LP-CH chassis)
Humidity Range	to 95% non-condensing (Recommended for use only in non-condensing environments)
Mounting	In applications slot in Model LP-CH-16 LaserPlus Chassis
Module Slots	One slot width: Slot# 1-15 (inclusive)
Powering	5.25VDC per module
Protection	3ASB fuse [Littelfuse PN# 0454033 ; Olson PN# 286-000009]
RECEIVER INTERFACES:	
RF Output Connector	F-Type (rear of module)
RF Output Test Point	F-Type (front of module) -20 dB +/- 1.0 dB
RF Output Level Adjust	Variable control to set constant output level for Optical Input from -14dBm to 0dBm (front of module)
Optical Input Connector	SC/APC standard; FC/APC optional (front of module)
LED Indicators (Green/Red)	Optical Power Alarm; Laser Current Alarm; Cooler Alarm
Laser Enable/Disable	Recessed push-button switch (front of module)

