

LaserPlus: 1550nm 1 GHz FTTP/CATV DM Transmitter (LP-OT-FF)

1 GHz HIGH DENSITY, COMPACT CATV OPTICAL TRANSMISSION PLATFORM

Features / 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 accomodates 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 ±10nm option available for non-DWDM, CATV HFC and FTTx 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 Technology, Inc. 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-multiple-receiver (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* **Model 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.*

LaserPlus: 1550nm 1 GHz FTTP/CATV DM Transmitter (LP-OT-FF)
1 GHz HIGH DENSITY, COMPACT CATV OPTICAL TRANSMISSION PLATFORM

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 nm) 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	In applications 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

Ordering Information

<u>Model No.</u>	<u>Description</u>
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** data sheets.