

LaserPlus: DWDM Return Path Transmitter (LP-OT-10-RDxx)

1 GHz HIGH DENSITY, COMPACT CATV OPTICAL TRANSMISSION PLATFORM

Features / Benefits

- Available in 17 ITU-Grid wavelengths for DWDM transport of upstream signals
- **Wide RF bandwidth** of 5-300 MHz for maximum return path capacity
- **10dBm optical output** for 16-channel loss budgets to 11 dB (>40 km) without an EDFA; > 60 km with
- Compatible with Olson Technology, Inc. **LaserPlus LP-OR-300** triple return path optical receivers
- Compatible with Olson Technology, Inc. **SpectrumPlus OTUC-400** upstream 4:1 block converters, to facilitate transport of up to **(64) 5-42 MHz return paths over 60 km on one (1) optical fiber**
- **Excellent noise-power-ratio (NPR) over wide dynamic range for today's & tomorrow's services**
- Advanced predistortion circuitry = excellent CSO/CTB performance
- Simple initial set-up: adjust transmitter for RF input level and GO!
- Front Panel RF Input test point: 75 Ohm F-type
- Front Panel Optical Power & Laser Current test points: via high-impedance voltmeter
- Front Panel status LEDs: Optical Power, Laser Current and Cooler summary alarms
- Energy-efficient internal 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-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 **Olson Technology, Inc. Model LP-OT-10-RDxx 1550nm ITU-Grid DWDM Return Path Transmitter** is a single-slot module for the **LaserPlus** optical transmission platform. It is engineered to meet both today's and tomorrow's advanced requirements for return path transmission of advanced upstream applications, with an optical loss budget to 14dB (>60km) when an 8 wavelength DWDM system is deployed. With an NPR value of 40 dB over a dynamic range of 15 dB (higher than other vendors with NPRs from 40/10 dB to 35/13 dB), this transmitter ensures error-free transport of all current return path services (QPSK & 16/64 QAM – requires NPR > 30 dB), as well as future return path services utilizing sophisticated “HI-PHY” modulation schemes (ODFM & 256 QAM - requires NPR of 40 dB). The rugged, low-profile, amplitude-modulated **Model LP-OT-10-RDxx** transmitter utilizes a high-quality, optically isolated, cooled 1550 nm DWDM ITU-Grid laser with an optical output power of 10 mW . It is packaged as a convenient, hot-swappable plug-in module, and features an RF driver, integrated laser cooler circuitry, advanced predistortion electronics, front panel RF and optical test points, and front panel LEDs which provide immediate visual status of the unit. Enhanced local and remote monitoring of the transmitter is also provided via summary alarms to LEDs on the **Model LP-PS-x** power supplies, via contact closures on the **Model LP-CH-16B** chassis, and additionally via the optional **Model LP-CH-SNMP-1** element manager agent which is compatible with third-party solutions. The design of this transmitter facilitates initial setup by requiring only a simple RF input gain adjustment via easily accessible front panel variable attenuator to bring the units online.

The **LaserPlus Model LP-OT-10-RDxx** return transmitter is the perfect companion to complementary Olson optical products, such as: the **LaserPlus Model LP-OR-300** and **LaserLite Model OTOR-300** return path receivers, **LaserLite Model OTDWM-x** Mux/Demuxes and the **SpectrumPlus Model OTUC-400** 4:1 Return Path Hub Block Upconverter. In fact, by combining the **Model LP-OT-10-RDxx** return path transmitter with the **Model OTUC-400** upconverter, system operators can confidently transport up to 64 return path signals (@ 5-42MHz) on a single optical fiber over 14dB of optical loss (> 60km) in a robust, proven and cost-effective manner.

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Quality / Engineering / Innovation

Specifications

RF INPUT & PERFORMANCE PARAMETERS:

Frequency Range	5MHz to 300MHz
Frequency Response	±1.0 dB
Input Impedance	75 Ohms
Input Return Loss	> 16dB
Input Level for Optimum Performance	+15dBmV/carrier
Input Slope	0 dB
Noise Power Ratio (NPR)	15dB of Dynamic Range @ 40dB Threshold

OPTICAL PARAMETERS:

Center Wavelength(s) (±0.1 nm)	ITU-Grid: Channels 21-35 & 43-59 (1530.33-1542.94nm and 1549.32-1560.61nm in 200GHz channel spacing)
Output Powers	10dBm/10mW
Laser Type	Cooled, Isolated DFB (optimized for return path band)

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 (0.454 kg)
Operating Temperature Range	0°C to +50°C (+32°F to +122°F) <i>(Air temperature measured at air inlet of Model LP-CH chassis)</i>
Humidity Range	to 95% non-condensing <i>(Recommended for use only in non-condensing environments)</i>
Mounting	In applications slot in Model LP-CH-16 LaserPlus Chassis
Module Slots	One slot width: Slot# 1-15 (inclusive)
Powering	5.25V _{DC} per module
Protection	3A SB fuse [<i>Littelfuse PN# 0454033; Olson PN# 286-000009</i>]

TRANSMITTER INTERFACES:

RF Input Connector	F-Type (<i>rear of module</i>)
RF Input Test Point (<i>F-Type Connector</i>)	+10dBmV/carrier @ 25MHz for optimal OMI & performance
Input Level Adjust	+4dB (to +19dBmV/carrier) via variable attenuator (<i>front of module</i>)
Optical Output Connector	SC/APC standard; FC/APC optional (<i>front of module</i>)
LED Indicators (<i>Green/Red</i>)	Optical Power Alarm; Laser Current Alarm; Cooler Alarm

Ordering Information (LP-OT-10-RDxx)

<u>Model No.</u>	<u>Description</u>
LP-OT-10-RDxx	LaserPlus DWDM Return TX module; 5-300MHz; 10dBm/10mW DFB; SC/APC connector xx = Channels 21-35 and 43-59 (1560.60, 1558.98, 1557.36, 1555.75, 1554.13, 1552.52, 1550.92, 1549.32 nm) (1542.94, 1541.35, 1539.77, 1538.19, 1536.61, 1535.04, 1533.47, 1531.90, 1530.33 nm)

All specifications are subject to change without notice

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