

LegacyPlus HLN384x Return Path Transmitter

Replacement/Upgrade Transmitter Modules for Harmonic PWRBlazer HLN 384x HFC Nodes

Features / Benefits

- FP, DFB (1310 or 1550nm) or CWDM (ITU-grid 1470-1610nm) return path optical transmitters
- For the installed base of Harmonic HLN 3841/3842/3843/3844 PWRBlazer HFC optical nodes
- Performs significantly better than or equal to the original Model NTM 324x modules
- Reduced laser clipping in VoIP deployments via DFB or CWDM module replacement of FP lasers
- Also ideal for systems undergoing “node splitting” for return path segmentation purposes
- Low cost alternative to DWDM transmitters, digital reverse & other node segmentation methods
- RF test point (-10 dB) & Plug-in pad attenuator facilitates easy adjustment of RF Input drive level
- Convenient DC test point scaled to Optical Output power (1V/mW)
- Low power consumption & good heat dissipation for increased service life and reliability
- Field-proven since 1999: Olson TX & RX modules successfully deployed in 1000's of nodes worldwide

The **OLSON TECHNOLOGY, INC. (OTI) LegacyPlus** series of Replacement & Upgrade Modules for Installed HFC Optical Nodes is a high performance, low cost, field proven group of custom engineered products specifically designed to upgrade the functionality of installed optical nodes from many major manufacturers by dramatically increasing upstream or downstream bandwidth without having to replace optical nodes or deploy extra fiber, 1550nm ITU grid DWDM lasers, baseband digital reverse modules, or other expensive return path segmentation technologies.



OLSON TECHNOLOGY, INC. LegacyPlus HLN 384x Return Path Transmitter Modules have been specifically designed so that node modules can be replaced, if needed, with any module or unit of the same type and the same optical and electrical specifications from Harmonic, Inc., the original manufacturer of the PWRBlazer HLN384x node family. Hence, the replacement of a node based Return Path Transmitter Module does not require replacement of the corresponding headend optical receiver or vice versa.

LegacyPlus products provide outstanding return path 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. There are two general types of reverse transmitters available: (1) Fabry-Perot (FP) type, which are lower priced and designed for low traffic data carrier transmission applications with less stringent performance requirements (i.e. element management,

set top box communications, etc.), and; (2) DFB/CWDM-type, which support analog video channels and/or high capacity data traffic (i.e. Internet access, telephony, etc.).

The introduction of VoIP telephony adds even tougher constraints to return path performance. Originally deployed FP transmitter modules tend to exhibit laser clipping. One of the end results of clipping is packet loss, which is very detrimental to VoIP. **LegacyPlus** DFB & CWDM TX modules, with their inherently higher dynamic range, provide cost effective and robust migration alternatives to FP laser reverse transmitters during pre-VoIP plant upgrades.

In addition to the many “standard” **LegacyPlus** modules currently available to system operators, **OLSON TECHNOLOGY, INC.** continues to work with MSOs to define, refine, develop and manufacture new solutions custom tailored to their individual system requirements. For the latest information or to discuss possible module availability or design for unlisted nodes, please contact **OLSON TECHNOLOGY, INC.** directly.

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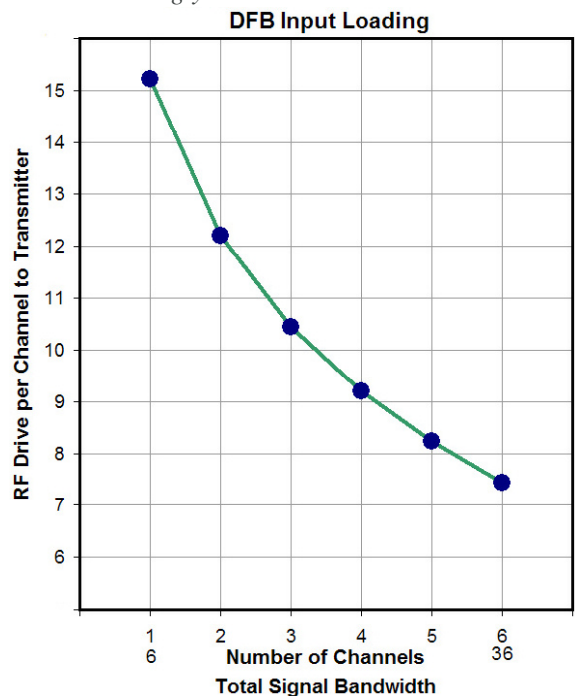
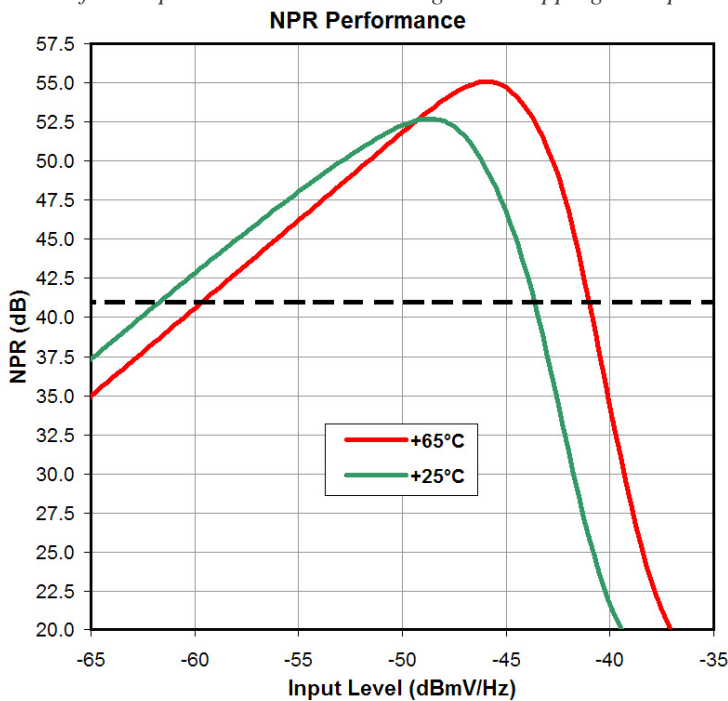
Specifications (Return Path Optical Transmitters: FP, DFB & CWDM)

RF INPUT & PERFORMANCE PARAMETERS:

Frequency Response Range (± 1.0 dB)	5 MHz to 220 MHz	
Return Path NPR (DFB/CWDM) *	> 15dB over 41dB NPR*	
Return Path Threshold (DFB/CWDM) *	-57 dBmV/Hz	@41dB NPR Threshold
Return Path NPR (FP) *	> 15dB over 37 dB NPR*	
Return Path Threshold (FP) *	-57 dBmV/Hz	@37 dB NPR Threshold
Input Return Loss	> 16 dB	
Input Level **	(see graph) **	
Input Level Laser Drive Test Point	-10 dB (± 1 dB)	

* NOTE: As measured with 10dB of fiber & Olson Model OTOR-300 Return Receiver and 6-channel 35MHz loading, with +3 dBmV per channel RF Input (i.e. -7 dBmV @ the RF input test point).

** NOTE: Olson NTM 384x DFB/CWDM R-TXs have minimum 7dB of additional gain available for CNR improvement in lower channel or bandwidth loading. For example, if only 2 channels are used, the NPR curve (see graph) allows for an additional 5 dB of RF input level without inducing laser clipping to improve the CNR level accordingly.



OPTICAL OUTPUT PARAMETERS:

Optical Output (FP)	2.0 mW (unisolated and isolated versions) @ 1310nm
Optical Output (DFB)	1.0, 2.0 or 3.0 mW @ 1310nm/2.5 mW @ 1550nm
Optical Output (CWDM)	2.5mW @ 1470, 1490, 1510, 1530, 1550, 1570, 1590 or 1610nm
Return Loss	> 60 dB with APC connector
Optical Connector	SC/APC standard; FC/APC optional (8°APC); SC/UPC optional

USER INTERFACE

RF Input Test Point	-10 dB (± 1 dB)
Optical Output Level	1V/mW
DC Power	Green LED
Optical Power Alarm	Green/Red LED
Interstage RF Plug-In SXP Type Pad	7 dB to control Input RF signal path to laser
Status Monitoring Plug-In SXP Type Pad	0 dB to control Status Monitoring path to laser

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Specifications (continued)

ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS

Dimensions (WxHxD)	5.5" x 2.0" x 2.0" (14 cm x 5.1 cm x 5.1 cm)
Weight	0.8 lbs (0.361 kg)
Operating Temperature Range	-40 to +70°C (temperature at the mounting plate)
Powering	+12 V _{DC}
Power Dissipation	< 3 W
Mounting	Inside Harmonic HLN 3841/3842/3843/3844 optical node

Ordering Information

<u>Model Number</u>	<u>Description (Optical Output Power; Wavelength; Laser Type; Optical Connector)</u>
NTM-3244-SA/302	R-TX Module; Harmonic HLN384x; 5-220MHz; 2mW unisolated 1310nm FP; SC/APC
NTM-3244-SA/303	R-TX Module; Harmonic HLN384x; 5-220MHz; 2mW isolated 1310nm FP; SC/APC
NTM-3245-SA/304	R-TX Module; Harmonic HLN384x; 5-220MHz; 3mW 1310nm DFB; SC/APC
NTM-3245-SA/304/1MW	R-TX Module; Harmonic HLN384x; 5-220MHz; 1mW 1310nm DFB; SC/APC
NTM-3245-SA/304/2MW	R-TX Module; Harmonic HLN384x; 5-220MHz; 2mW 1310nm DFB; SC/APC
NTM-3248-SA/505	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1550nm DFB; SC/APC
NTM-3247-SA/547	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1470nm CWDM DFB; SC/APC
NTM-3247-SA/549	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1490nm CWDM DFB; SC/APC
NTM-3247-SA/551	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1510nm CWDM DFB; SC/APC
NTM-3247-SA/553	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1530nm CWDM DFB; SC/APC
NTM-3247-SA/555	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1550nm CWDM DFB; SC/APC
NTM-3247-SA/557	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1570nm CWDM DFB; SC/APC
NTM-3247-SA/559	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1590nm CWDM DFB; SC/APC
NTM-3247-SA/561	R-TX Module; Harmonic HLN384x; 5-220MHz; 1.5mW 1610nm CWDM DFB; SC/APC

* NOTE: Substitute "SU" for "SA" if SC/UPC optical connector is required

NOTE: Substitute "FA" for "SA" if FC/APC optical connector is required

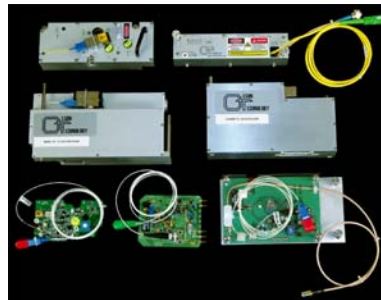
NOTE: Substitute "FU" for "SA" if FC/UPC optical connector is required

Additional HFC Optical Nodes supported by Olson's LegacyPlus

The following is a partial list of HFC optical nodes for which Return Transmitter and/or Forward Receiver Modules are either available or under development.

Please contact **OLSON TECHNOLOGY, INC. (OTI)** regarding availability of units not listed below.

* ADC/C-COR	ISX-3030/3040 & 3021
* Antec/Texscan	Gateway II, GlassPal & FlameThrower
* Arris/Antec	LLRX100, LLRX200, LLRX400 Gemini
* Augat	Megaflex
* Harmonic	HLR3830 & HLN3841/3842/3843/3844 PWRBlazer
* Motorola/GI	BTN-2, AM-MBR & SG2000/2440
* Philips/Magnavox	7-OR Diamond Point
* Scientific-Atlanta	6920, 6940/6942/6944 & Gainmaker



Quality / Engineering / Innovation

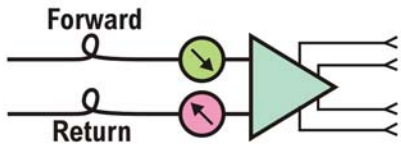
www.olsontech.com

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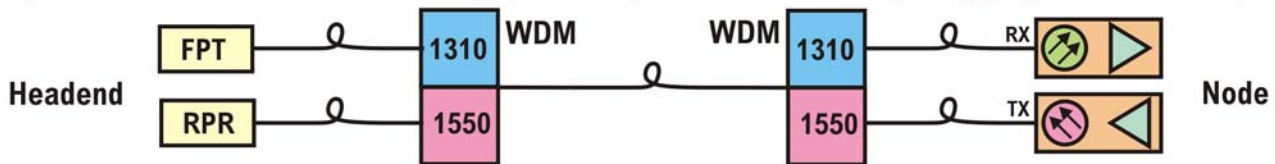
Typical Applications

1. STANDARD 2-WAY CONFIGURATION *(for Node Upgrade, Maintenance and Repair):*

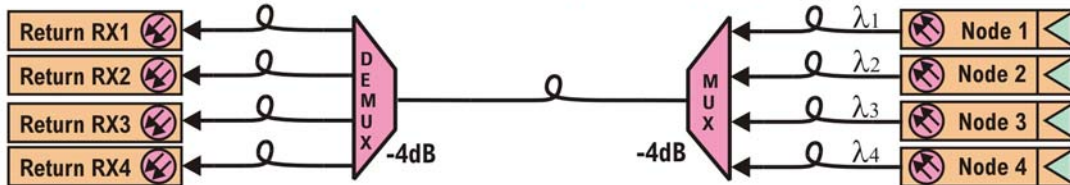


- A. One-way to Two-way Node Upgrade
- B. OEM Module Replacement for Routine Maintenance and Repair
- C. FP to DFB Laser Upgrade for VoIP Telephony System Deployment

2. SINGLE FIBER CAPACITY DOUBLING *(WDM in forward/return node splitting for fiber conservation):*



3. MULTIPLE NODE RETURN PATH MULTIPLEXING *(CWDM for return path fiber conservation)*



4. RETURN PATH SEGMENTATION & REDUNDANCY *(WDM or CWDM for return fiber conservation):*

