

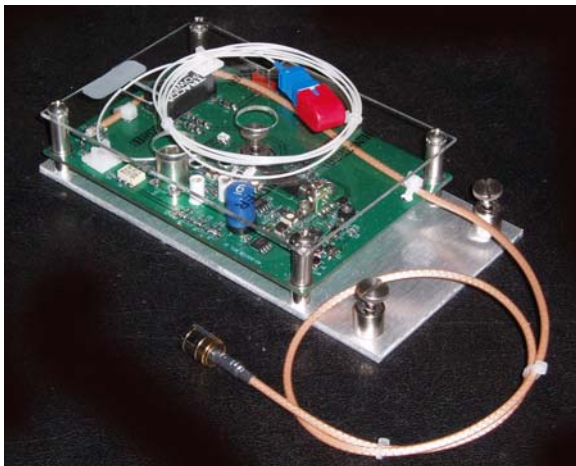
LegacyPlus LLRX200 Return Path Transmitter

Replacement/Upgrade Modules for Arris/Antec Gateway II LLRX200 HFC Nodes

Features / Benefits

- FP, DFB (1310 or 1550nm) or CWDM (ITU-grid 1470-1610nm) laser return path optical transmitters
- For installed base of Arris/Antec Model # LLRX200 Gateway II HFC optical nodes
- Performs significantly better than or equal to the original Model RDL/RVD modules
- To minimize clipping in VoIP deployments, DFB or CWDM module replacement of FP lasers
- Ideal for systems undergoing “node splitting” for return path segmentation purposes
- Low cost alternative to DWDM transmitters, digital reverse & other node segmentation methods
- Field proven since 1999: Olson Tx & Rx modules successfully deployed in 1000’s of nodes worldwide
- Low power consumption & good heat dissipation for increased service life and reliability
- Low Cost; Stable operation over Time, Temperature and Signal Loading; Convenient test points

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. (OTI) LegacyPlus LLRX200 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 Arris/Antec, the original vendor/supplier of the LLRX200 node. 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 sup-

port analog video channels and/or high capacity data traffic (i.e. Internet access, telephony, etc.).

The introduction of VoIP services adds even tougher constraints to return path performance. Originally deployed FP return path transmitter modules tend to exhibit laser clipping. One of the end effects 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 return 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.

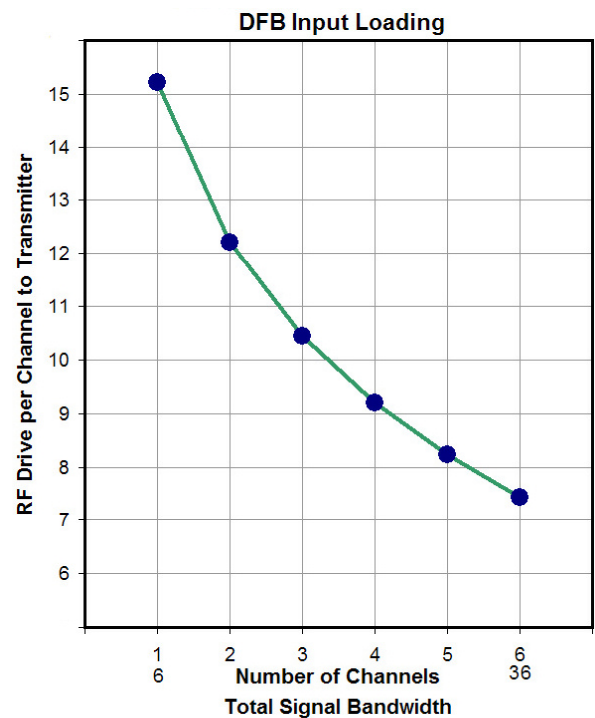
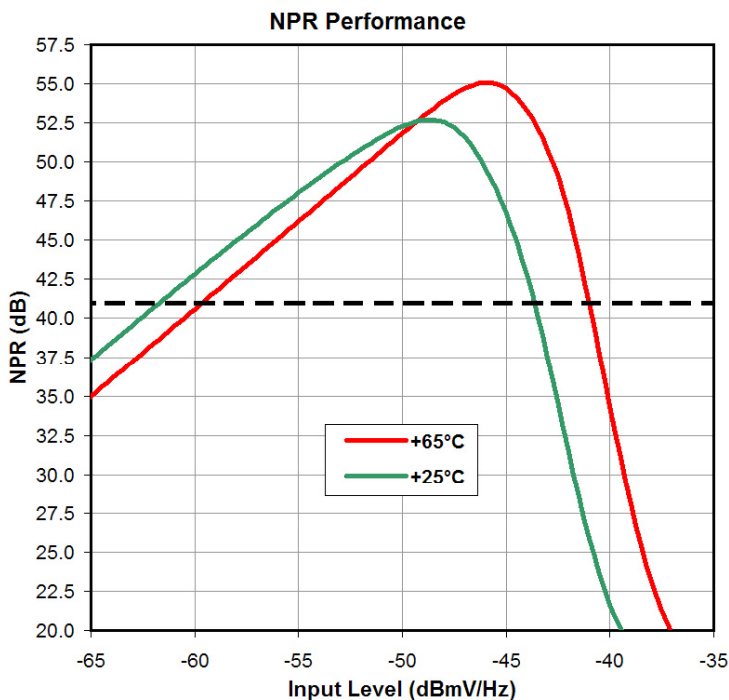
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Specifications (Return Path Optical Transmitters: FP, DFB & CWDM)

RF INPUT & PERFORMANCE PARAMETERS:

Frequency Range (± 1.0 dB)	5 MHz to 220 MHz	
Return Path NPR (DFB/CWDM) *	> 15dB over 41dB NPR*	@41dB NPR Threshold
Return Path Threshold (DFB/CWDM) *	-57 dBmV/Hz	
Return Path NPR (FP) *	> 15dB over 37dB NPR*	@37dB NPR Threshold
Return Path Threshold (FP) *	-57 dBmV/Hz	
Input Return Loss	> 16dB	
Input Level	(see graph)	
Input Level Laser Drive Test Point	-20 dB	

* NOTE: As measured with 10dB of fiber and Olson Model # OTOR-300 Return Path Receiver



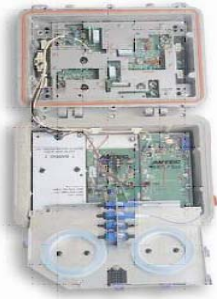
OPTICAL OUTPUT PARAMETERS:

Optical Output (FP)	2.0 mW (unisolated and isolated versions) @ 1310nm
Optical Output (DFB)	1.0 or 2.0mW @ 1310nm/2.5 @ 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

ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS

Dimensions (L x H x D)	5.8" x 1.0" x 3.1" (147mm x 25mm x 79mm)
Weight	0.5 lb (0.22 kg)
Operating Temperature Range	-40 to +70°C (temperature at the mounting plate)
Powering	+24V _{DC}
Power Dissipation	< 3 W
Mounting	Inside Arris/Antec LLRX200 Gateway II HFC optical node

LegacyPlus LLRX200 Return Path Transmitter



Ordering Information

Model Number

Description (Optical Output Power; Wavelength; Laser Type; Optical Connector)

ARLL2-RDL-SA/302	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 2mW unisolated 1310nm FP; SC/APC
ARLL2-RDL-SA/303	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 2mW isolated 1310nm FP; SC/APC
ARLL2-RVD-SA/304	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 3mW 1310nm DFB; SC/APC
ARLL2-RVD-SA/304/1MW	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1mW 1310nm DFB; SC/APC
ARLL2-RVD-SA/304/2MW	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 2mW 1310nm DFB; SC/APC
ARLL2-RVD-SA/505	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1550nm DFB; SC/APC
ARLL2-RVD-SA/547	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1470nm CWDM DFB; SC/APC
ARLL2-RVD-SA/549	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1490nm CWDM DFB; SC/APC
ARLL2-RVD-SA/551	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1510nm CWDM DFB; SC/APC
ARLL2-RVD-SA/553	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1530nm CWDM DFB; SC/APC
ARLL2-RVD-SA/555	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1550nm CWDM DFB; SC/APC
ARLL2-RVD-SA/557	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1570nm CWDM DFB; SC/APC
ARLL2-RVD-SA/559	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1590nm CWDM DFB; SC/APC
ARLL2-RVD-SA/561	R-TX Module; Arris/Antec LLRX200; 5-220MHz; 1.5mW 1610nm CWDM DFB; SC/APC

- * *NOTE: Substitute "SU" for "SA" if SC/UPC optical connector is required
Substitute "FA" for "SA" if FC/APC optical connector is required
Substitute "FU" for "SA" if FC/APC 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, LLRX-400 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 | 6910, 6920, 6940/6942/6944 & Gainmaker |



Quality / Engineering / Innovation

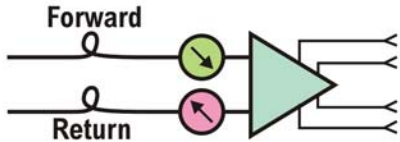
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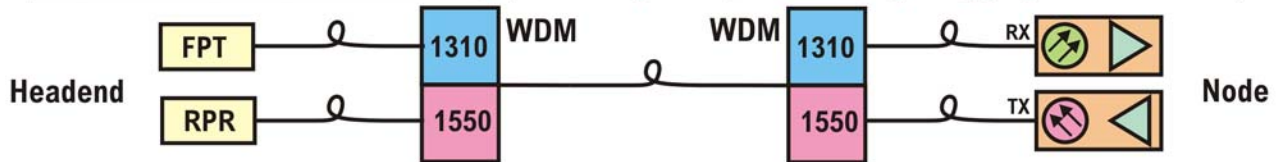
Typical Applications

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

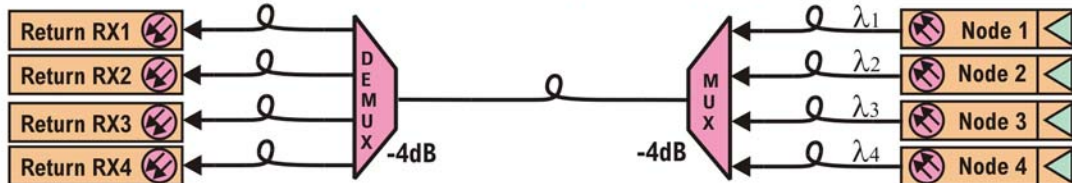


- A. One-way to Two-way Node Upgrade
- B. OEM Module Replacement for Routine Maintenance and Repair
- C. FP to DFB Laser Upgrade for VoIP Telephony System Deployment

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):*

