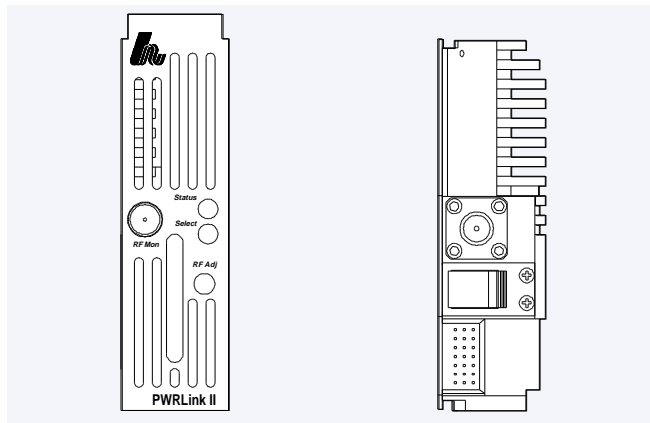


PWRLink™ II DFB Transmitter



Product Description

Harmonic Lightwaves' PWRLink II is a family of 1310 nm DFB laser transmitter modules. The PWRLink II provides the same high performance of the previous generations of PWRLink transmitters, but now in an even more compact and cost-effective package. Designed for advanced broadband networks, PWRLink II transmitters can operate alone in local distribution and narrowcasting applications and in combination with Harmonic Lightwaves' externally modulated transmitter family for complete system solutions.

The PWRLink II transmitter modules are very compact with 10 transmitter modules fitting into a single three rack unit high HLP 4200 platform. The transmitter modules fit into the platform via the HMC 4000 module carrier adapter. The transmitter modules are intelligent and easy to configure by means of the user-friendly interface, allowing for set up in minutes. Set up is possible three ways: via the HLP 4200WD platform front panel menu, the RF adjustment on the module front panel, or the NETWatch™ Element Management System.

Due to its advanced predistortion circuitry, the state-of-the-art PWRLink II transmitter delivers high performance with RF distortion suppression, enabling system designers to achieve very high carrier-to-noise performance while avoiding receiver overdrive problems. Continuous high performance and reliability of the transmitters are assured by a microprocessor and associated firmware which control and monitor all vital functions. Monitored functions include laser temperature and operating point, optical power and module temperature. The transmitter's flat frequency response and wide operating temperature range maximize overall broadband network performance.

The optical components within the PWRLink II transmitter module have been designed for ease-of-use and maintenance. The optical connector is mounted on a removable plate on the back of the unit. This feature facilitates simple cleaning of the connector, ensuring consistently high picture quality.

Advantages

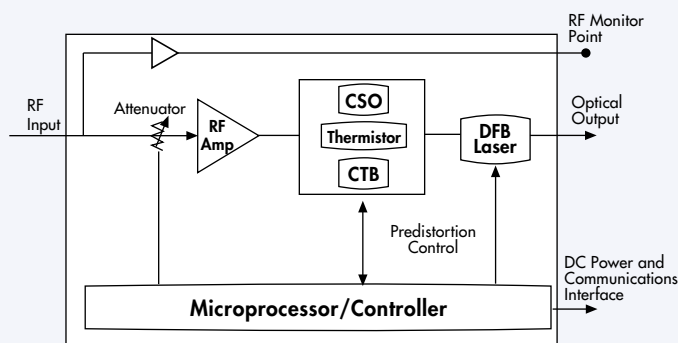
The innovative design of the PWRLink II transmitter and Harmonic's complete broadband system offer many advantages to address the needs of today and tomorrow, making it the industry's leading solution for broadband networks:

- Integrated RF pre-amplifier reduces transmitter drive level requirements.
- Shares common platform with Harmonic's MAXLink™ 1550 nm transmission system.
- Compact size enables 10 DFB transmitters to fit in a 3 RU platform.
- Advanced predistortion circuitry and algorithm for both CTB and CSO provide state-of-the-art distortion cancellation over a wide temperature range.
- Integrated element management with SNMP compatibility.
- Microprocessor control of all key parameters provides consistent and optimum product performance and monitoring.
- Offers a wide range of performance levels, providing cost-effective solutions to meet specific system requirements.
- 750 MHz bandwidth provides flexibility in delivery of signals and services with either 80 channels to 550 MHz with an additional 200 MHz for digital information or full 110 channel loading.
- Unparalleled flat frequency response provides high performance and efficient system integration.
- Simple "plug and play" operation reduces time and cost of installation.

Applications

- Combinations of broadcast video and digital narrowcasting
- DFB-1550 nm hybrid cascades for trunking, supertrunking and interconnects
- High performance transport of 750 MHz over links of up to 40 km
- Analog and digital narrowcasting

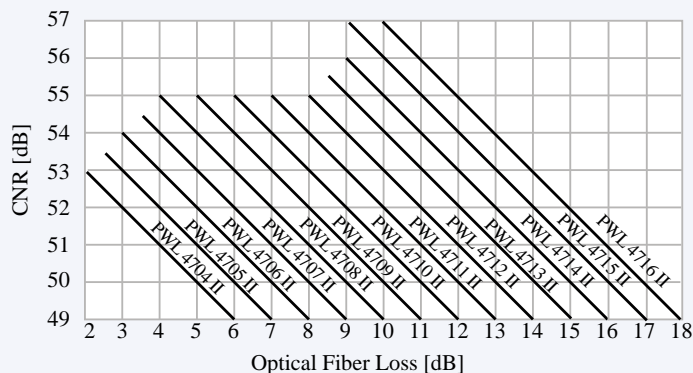
Standard Configuration





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PWRLink II CNR vs. Optical Fiber Loss
 80 System M (NTSC) Channels 1, 2, 3



1. Specifications for 80 unmodulated System M (NTSC) channels and 200 MHz digital at -10 dBc.
2. Optical link defined as PWRLink II transmitter + 100% fiber link + HRM 3810 receiver.
3. For System B/G, I and D (PAL), decrease CNR by approximately 1 dB (5 MHz video bandwidth).

Link Performance

Carrier-to-noise (CNR): Shown in figure above.
 Carrier-to-CSO: > 64 dB
 Carrier-to-CTB: > 68 dB
 These specifications are typical performance, given for 100% fiber optical links.
Over 90% of PWRLink II transmitters are guaranteed to meet typical performance. Subtract 1 dB from CSO and CTB specifications for worst case performance.
 When link includes optical splitter loss add 0.1 dB to CNR for every 1 dB of splitter loss.

Optical Output

Wavelength: 1290 - 1330 nm
 Flatness: < 1 dB peak-to-valley

Model	Optical Power (dBm)	Typical Modulation Index ⁴ (%)
PWL 4704 II	5.0 ± 0.5	3.3 ± 0.25
PWL 4705 II	5.5 ± 0.5	3.4 ± 0.25
PWL 4706 II	6.0 ± 0.5	3.5 ± 0.25
PWL 4707 II	7.0 ± 0.5	3.6 ± 0.25
PWL 4708 II	8.0 ± 0.5	3.8 ± 0.25
PWL 4709 II	9.0 ± 0.5	3.8 ± 0.25
PWL 4710 II	9.5 ± 1.0	3.8 ± 0.25
PWL 4711 II	10.5 ± 1.0	3.8 ± 0.25
PWL 4712 II	11.0 ± 1.0	3.8 ± 0.25
PWL 4713 II	11.5 ± 1.0	3.9 ± 0.25
PWL 4714 II	12.0 ± 1.0	4.0 ± 0.25
PWL 4715 II	12.5 ± 1.0	4.0 ± 0.25
PWL 4716 II	13.0 ± 1.0	4.0 ± 0.25

RF Input

Input level range
 PWL 4704 II – PWL 4713 II: 15 to 22 dBmV
 PWL 4714 II – PWL 4716 II: 18 to 22 dBmV
 Operational bandwidth: 45 to 750 MHz
 RF attenuator adjustment range: 10 dB
 Impedance: 75 Ω
 Return loss: > 16 dB
 Level control: Manual

User Interface

Front panel
 Bi-state status LED: Normal = Green, Alarm = Red
 Module selection indicator: Yellow LED
 RF attenuation adjustment
 Monitor point
 Laser RF drive monitor
 Flatness: ± 1.0 dB
 Return loss: > 16 dB
 Connector type: Standard Female F

Element Management System - NETWatch™/HEM

HEM interface: RS-485, RS-232C connectors (in HLP 4200)

Power Requirements

Nominal: +24 VDC; supplied by HLP 4200 bus
 Maximum: +28 VDC
 Consumption: 22 Watts maximum

Environmental

Operating temperature range⁵: 0° to +50° C / +32° to 122° F
 Storage temperature range: -40° to +70° C / +32° to 158° F
 Automatic three-speed fan adjustment at: 40° & 50° C / 104° & 122° F
 Relative humidity: Maximum 85% non-condensing
 Over temperature laser protection: Software and hardware

Physical

Dimensions: 1.3" W x 4.4" H x 11.7" D / 3.3 cm W x 11.2 cm H x 29.7 cm D
 Weight: 3.6 lbs. / 1.6 kg
 Mounting: HLP 4200 platform; via module carrier HMC 4000
 Optical connector type: SC/APC⁶
 RF connector type: Standard F, RG-59 cable type (accepts 0.64 - 0.8 mm center conductor diameter)

4. Modulation index given for 80 System M (NTSC) channels.
5. For operation over entire temperature range, subtract 2 dB from CSO and CTB performance specifications.
6. Other connector types available upon request.