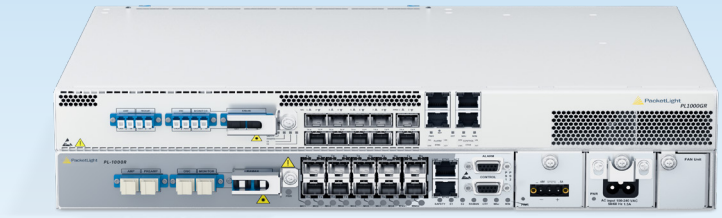


PL-1000R/GR Raman Amplifier

Counter-propagating Raman amplifier and hybrid Raman-EDFA

Features Overview

- Counter-propagating Raman amplifier with optional embedded booster and preamp EDFAs
- Detection of open connectors and/or broken fiber up to few tens of kilometers from the pump module
- High power connector safety switch cover
- **Supports the following Raman configurations:**
  - Counter-propagating Raman
  - Hybrid Raman-EDFA
- **Average gain for G.652 fiber**
  - PL-1000R: Up to 12dB
  - PL-1000GR: Up to 18dB
- Gain flattening optimization based on fiber type and pump power
- Effective noise figure (NF) of -1dB
- Remote management with OSC
- Remote management and fiber monitoring with OSC OTDR SFP
- Low power consumption
- Dual AC/DC pluggable power supply and pluggable fan unit
- Web-based GUI and SNMP EMS management

Distributed Raman Amplification

The PL-1000R/GR are designed for distributed Raman amplification applications, cost-effectively extending the optical link power budget and significantly improving OSNR, for building long haul and ultra long haul DWDM networks. The Raman enables several configurations, including counter-propagating and hybrid Raman-EDFA.

Main Benefits

- Acts as terminal Raman amplifier and as inline hybrid Raman-EDFA
- Full remote monitoring
- Eye safety feature - automatically reduces optical output power in case of fiber interruption
- Integrates with PacketLight management platforms and transponder/muxponder products
- Available in front-to-back or side-to-side airflow platforms

Laser Safety

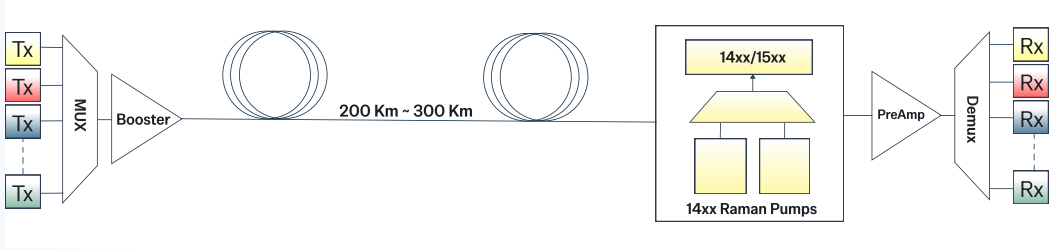
The PL-1000R/GR are fully managed, configured and monitored remotely as part of the network via optical supervisory channel (OSC).

The Raman includes three eye safety mechanisms that reduce the optical output power of the device in cases of fiber link disruption, such as open connectors or broken fiber, even at a distance of a few tens of kilometers from the unit.

Recommended Applications

- Long repeaterless links
- Low latency links (less FEC and O-E-O conversion)
- Storage area networks (SANs), remote locations, disaster recovery
- Security-sensitive applications
- Improving OSNR in long-haul and ultra-long haul links
- High capacity transmission and/or increasing channel count to 96 channels

PL-1000GR Raman Amplification Solution



PL-1000R/GR Raman Amplifier

Technical Specifications

Optical Specifications - Raman

Wavelength Range: 1529-1565nm

Wavelength Range, OSC: 1500-1520nm

Input Power Range: -47dBm to -5dBm

Gain:

- PL-1000R: 12dB
- PL-1000GR: 14dB

Maximum Pump Power: 760mW

Operating Mode:
Automatic power control (APC)

Gain Flatness: +/-0.6dB

Signal Insertion Loss: 2.9dB

Noise Figure: -1dB

PDG: 0.3dB

PMD: 0.6psec

Eye Safety:
Automatic reduction of optical output power in case of fiber interruption

Monitored Parameters

- Pump power
- Signal power
- Back-reflected power
- Operating temperature

Optical Specifications - Booster EDFA

Output Power: Up to 23dBm

Input Power: -24dBm up to 14.5dBm

Gain: 8dB to 22dB

Optical Specifications - PreAmp EDFA

Output Power: Up to 20dBm

Input Power: -36dBm min.

Gain: 20dB

Network Management

Management Ports, PL-1000R:

- 2xRJ-45 LAN port 10/100MBase-T
- 2xOSC SFP MNG ports 1000MBase-X
- 8xSFP MNG ports 100MBase-X
- RJ45 serial port
- RJ45 external alarm port

Management Ports, PL-1000GR:

- 2xRJ-45 LAN port 10/100/1000MBase-T
- 2xOSC SFP MNG ports 100/1000MBase-X
- 8xSFP MNG ports 1000MBase-X
- RJ45 serial port
- RJ45 external alarm port

Management Protocols:
SNMP, HTTP, HTTPS, CLI over RS-232 or CLI over Telnet/SSH, Syslog, RADIUS, TACACS+, SNTP

NMS:
PacketLight LIghtWatchTM NMS or third party NMS over SNMP

OAM:
Input/output power monitoring event logger and alarms

Management Channel: 2 x OSC

Visual Indicators:
LED status indicators for ports, eye safety, power and system

Software Upgrade:
Hitless traffic - Dual image

Power Supply

AC/DC:

- **PL-1000R:** 90 to 246 VAC or -36 to -60 VDC, 50/60 Hz, 60W max
- **PL-1000GR:** 100 to 240 VAC or -44 to -60 VDC, 50/60 Hz, 120W max

PSU Redundancy:
Single/dual feeding, hot swappable

Cooling Unit:
Hot swappable fan unit

Dimensions

PL-1000R Size:

- 1.77" (H) x 17.32" (W) x 9.05" (D)
- 45mm (H) x 440mm (W) x 230mm (D)

PL-1000GR Size:

- 1.77" (H) x 17.32" (W) x 13.78" (D)
- 45mm (H) x 440mm (W) x 350mm (D)

Weight:

- PL-1000R: 5.5kg / 12.13lb (max)
- PL-1000GR: 8.5kg / 18.74lb (max)

Mounting: 19", 21", 23"

Environmental

Operating Temperature:

PL-1000R:
-5ºC to 50ºC (+23ºF to +122ºF)

PL-1000GR:
0ºC to 45ºC (32ºF to 113ºF)

Humidity:
5% to 85% RH

Approvals & Standards

- CE, FCC, RoHS, REACH
- NEBS ready

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