Optical Return Loss Tester and Optical Power Meter

Article Overview

Optical Return Loss (ORL) testers measure reflected light in fiber networks, while Optical Power Meters (OPMs) measure the absolute optical power transmitted through the fiber.

Optical Return Loss Tester

An Optical Return Loss (ORL) tester quantifies the amount of light reflected back toward the source in a fiber optic system, expressed in decibels (dB) . High return loss (larger dB values) indicates low reflection and better fiber performance, while low return loss (closer to 0 dB) indicates higher reflections, which can degrade signal quality . ORL testers are essential for:

o Characterizing connectors, splices, and passive components like isolators .
o Ensuring compliance with network standards and minimizing signal interference.
o Measuring both total return loss and wavelength-dependent reflections when synchronized with tunable laser sources . Examples of ORL testers include the Keysight N7753C, which integrates power sensors and fiber couplers for fast, accurate measurements up to 70 dB, and the Santec RLM-100, capable of measuring single-mode return loss up to 85 dB with self-calibration features . The VIAVI SmartClass Fiber ORL-85 combines ORL measurement with optical power and connector inspection in a single compact device .

Optical Power Meter

An Optical Power Meter (OPM) measures the absolute optical power transmitted through a fiber, typically in milliwatts (mW) or dBm. It is used to:

o Verify signal strength in fiber optic links.
o Measure insertion loss and ensure proper network performance.
o Calibrate light sources and test equipment for accurate measurements . OPMs are often paired with a light source in Optical Loss Test Sets (OLTS), such as EXFO's FPM-600 Power Meter combined with the FLS-600 Light Source, enabling fast, automated measurements of loss, length, and polarity across multiple wavelengths . These devices support simplex, duplex, and multi-fiber connectors, making them suitable for data center and enterprise network certification .

Key Differences

FeatureOptical Return Loss TesterOptical Power MeterMeasuresReflected light (return loss)Transmitted optical powerUnitsdB (positive for ORL)dBm or mWPurposeDetect reflections, ensure low signal interferenceVerify signal strength, measure insertion lossTypical UseConnector and component characterizationNetwork link verification and calibrationIntegrationOften combined with tunable lasers or

light sourcesOften paired with light sources in OLTS kits

Combined Instruments

Modern instruments, like the VIAVI SmartClass Fiber ORL-85, integrate ORL measurement, optical power metering, light sources, and connector inspection into a single device, streamlining testing workflows and reducing the need for multiple instruments . This integration is particularly useful for field technicians and network engineers performing Tier-1 fiber certification and maintenance. In summary, ORL testers focus on reflections and signal quality, while OPMs focus on transmitted power and link performance, and both are critical for ensuring reliable fiber optic networks.

Dimension Multifiber IRL meter uses a high stability laser source and a high precision optical power meter for mandrel-free return

OCWR relies on making a basic power-meter measurement of launch power with no device connected and compares this to the

Tech Optics offers a range of return loss and insertion loss test equipment in single channel, multichannel

Explore the differences between OCWR and OTDR methods for measuring Optical Return Loss (ORL), their accuracy, advantages,

Shop Return Loss Meters (RLM) for precise fiber optic testing, dependable performance, and accurate network diagnostics across

Application note: Practical guide and overview of optical return loss management, test methods and ORL / back reflection fault

The Keysight N7753C optical return loss meter measures the optical power into and reflected from the device under test and

The Viavi 231121 is a SmartClass Fiber ORL-85 Optical Return Loss Meter, 1310/1550 nm with APC. It combines fiber inspection,

Optical Loss Test Sets (OLTS) are crucial instruments for comprehensive testing of optical fiber links in fiber optic communication

The redesigned integrating sphere detector can measure RL loss on dense 72-channel MTP/MPO and

Optical Return Loss Tester and Optical Power Meter

Optical Power Meters An optical power meter (OPM) is a type of electronic test device used to measure the power output of fiber

OCWR relies on a basic power-meter measurement of the launch power (assuming no DUT) as a base reference and compares this

Return Loss Measurements with up to 70 dB Dynamic Range. The N7753C optical return loss meter measures the optical power into

This document discusses the limitations on these optical return loss measurements. There is a limit to the range of

The SmartClass Fiber ORL-85 combines optical power meter (OPM), light source (OLS), continuous wave

The SmartClassTM Fiber ORL-85 combines fiber inspection, optical power meter (OPM), light source (OLS), and continuous wave

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