

Article Overview

Calibration of light source power meters ensures accurate optical measurements by comparing the meter to traceable reference standards under controlled conditions.

Purpose of Calibration

Calibration establishes the relationship between the readings of a device under test (DUT) and known reference values, ensuring measurement accuracy and traceability to national standards such as NIST in the U.S., PTB in Germany, or NPL in the UK (). This process is essential because photodiode detectors in power meters can drift over time due to aging, temperature cycling, or humidity exposure ().

Calibration Procedure

- o Reference Standards: A highly accurate reference power meter or transfer standard, often calibrated against a national standard, is used. For example, EXFO's IQS-1500 uses a cooled germanium detector with $\pm 0.9\%$ accuracy and ± 0.01 dB linearity ().
- o Light Source: A stable, power-regulated light source is required. Calibration is typically performed at specific wavelengths relevant to the application, such as 850, 1300, and 1550 nm for fiber optics ().
- o Comparison: The DUT is compared to the reference meter under controlled conditions. Measurements are taken at multiple wavelengths and power levels to account for detector responsivity variations ().
- o Software Control: Automated calibration systems, like EXFO's IQS-12002, manage measurements, reduce human error, and provide pass/fail results ().

Frequency and Verification

- o Annual Calibration: Most optical power meters should be calibrated every 12 months ().
- o Interim Checks: Between calibrations, performance can be verified by cross-checking against a known-good meter.
- o Documentation: Calibration labs issue certificates detailing deviations and traceability. Users should verify certificates and update tracking systems with the next due date ().

Practical Considerations

- o Detector Type: Silicon, germanium, or InGaAs photodiodes are common. Each has specific spectral responsivity and temperature sensitivity ().
- o Mounting and Optics: Kinematic mounts and consistent optical paths ensure repeatable measurements ().
- o Uncertainty: Certified labs typically achieve overall uncertainties of 10% or less for radiometry equipment ().
- o Lab Selection: Choose NIST-traceable or ISO/IEC 17025 accredited labs for reliable calibration ().



Calibration of Light Source Power Meter

Summary

Proper calibration of light source power meters involves using traceable reference standards, stable light sources, and controlled measurement procedures. Regular calibration, careful handling, and verification between calibrations ensure accurate and reliable optical power measurements for telecommunications, research, and industrial applications.

The power source supplies power with an alternating voltage U and current I to the load through the power meter. The power meter

Many companies find it advantageous to have an in-house calibration verification system for fiber-optic power meters, light sources,

The use of detector-based standards is very common in monochromatic radiometric applications such as

For lamp-based testing applications, we offer calibration light sources designed for the optical calibration of

This guide covers when to calibrate, what calibration actually involves, what a legitimate certificate looks

When precision matters most in your measurements, proper calibration techniques for power meters and sensors can

ILT calibrates a wide array of light measurement devices from manufacturers and distributors world-wide.

Learn how to operate, maintain, and calibrate GAO Tek's Optical Power Meters with detailed guidelines for accurate fiber optic

To achieve accuracy, calibrating of each electronic power meter is must and the calibration is done using a high-precision calibration

What light source and power meter do you need? There are many different types of light sources and

The Kingfisher traceable optical calibration laboratory is IEC / ISO17025 accredited and can calibrate optical power, loss, return loss

Before starting calibration, it's important to allow both the UV meter and the calibration light source to warm up to their



Calibration of Light Source Power Meter

These measurement services consist primarily of absolute laser power calibrations using either collimated beam or optical

Thorlabs" expanding line of optical power and energy meters includes a large selection of sensor heads, single- and dual-channel

In order to perform loss testing using an optical power meter and an optical laser source,

This calibration service provides absolute responsivity measurements for low power cw (continuous wave) laser power meters that

Web: <https://www.kremgroup.co.za>

