National Institute of Standards & Technology

Specifications

Standard Reference Instrument Series 6007

Optical Fiber Power Linearity System

Description: The Optical Fiber Power Linearity System is an instrument that measures the nonlinearity of optical fiber power meters (OFPMs). This system is capable of nonlinearity calibrations of OFPMs for the three nominal wavelengths of 850 nm or 980 nm, 1310 nm, and 1550 nm. A modular design for the laser sources' electronics has been implemented to simplify the maintenance of the system.

Keywords: optical fiber power meter, nonlinearity, linearity, calibration.

Design, assembly and technical measurements leading to the production of this SRI were performed by I. Vayshenker, NIST Applied Physics Division.

Support aspects involved in the issuance of this SRI were coordinated through the NIST Office of Reference Materials.

Specifications: NIST provides the Optical Fiber Power Linearity System as a Standard Reference Instrument (SRI) with performance that is equivalent to that of the NIST system in terms of accuracy and precision measurement capability, provided that operators follow recommended best practices as outlined in NIST Special Publication 250-56 "Optical Fiber Power Meter Nonlinearity Calibrations at NIST."

The Optical Fiber Power Linearity System has the following specifications and features.[1]

A) The OFPM linearity system will provide a dynamic range of 60 dB or higher.
B) Fabry-Perot lasers will be installed in the system.
C) Temperature and current controllers for the lasers will be provided with the system.
D) The 1310 nm and 1550 nm settings will use the same equipment (e.g., attenuator, optical switches, and shutters). However, 850 nm or 980 nm settings will require separate hardware.
E) A majority of system components are commercially available.
F) A modified linearity system for OFPMs including modified software will be submitted to the sponsor at the completion of the project. The software will be written using the Microsoft Visual Basic 6.0 language.
G) Typical expanded uncertainties for all three wavelengths are about 0.1% (k=2)

Marla L. Dowell, Chief
Applied Physics Division

Gaithersburg, MD 20899
Certificate Issue Date: 20 May 2016

Steven J. Choquette, Acting Director
Office of Reference Materials

[1] Certain commercial equipment, instruments or materials are identified in this certificate to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

Delivery and Shipping: Unless otherwise agreed by the parties, shipping terms shall be EXW (Incoterms 2010). NIST will prepare packaging for shipment of the SRI. Shipping crate dimensions and weight will be included in each quote. Customers are responsible for arrangement of shipping pickup at NIST as well as all customs duties and import fees (HTC 9014.80.1000).

Installation: Installation is not included in the price of the product and the customer should contact the technical division for information regarding the initial setup, training and support of this SRI.

Technical requirements at installation site: Customers must provide the following:

A) Appropriate storage facility for the system's unopened boxes, which will be opened only by NIST employees.
B) Appropriate facility to assemble laser sources, i.e. antistatic mat and assembly bench.
C) An optical bench dedicated to the OFPM linearity system.
D) A computer cart for the system's computer and printer.
E) An OFPM as a device under test to verification of the Optical Fiber Power Linearity System.

Users of this SRI should ensure that the Specifications Certificate in their possession is current. This can be accomplished by contacting the Office of Reference Materials: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/sri.