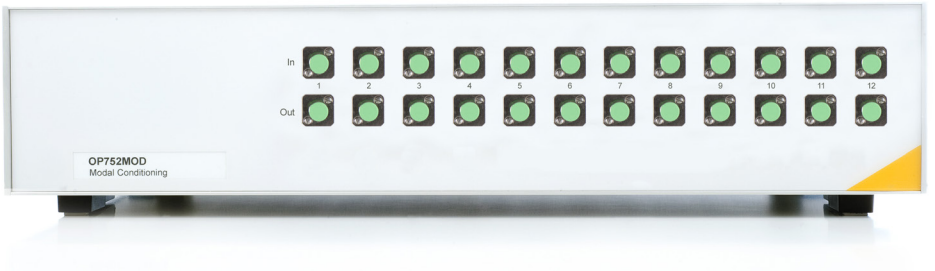
OptoTest

Your Partner in Fiber Optic Test Solutions



OP752-MOD

Multichannel Modal Conditioner

Instruction Manual

www.optotest.com | 1.805.987.1700

Contacting OptoTest Corporation

1.805.987.1700 (7:30 a.m. to 5 p.m. PST)
www.optotest.com
engineering@optotest.com

OptoTest Corp.
4750 Calle Quetzal
Camarillo, CA 93012 USA

Notice of Proprietary Rights

MnOP752MOD-RevB

OP752-MOD

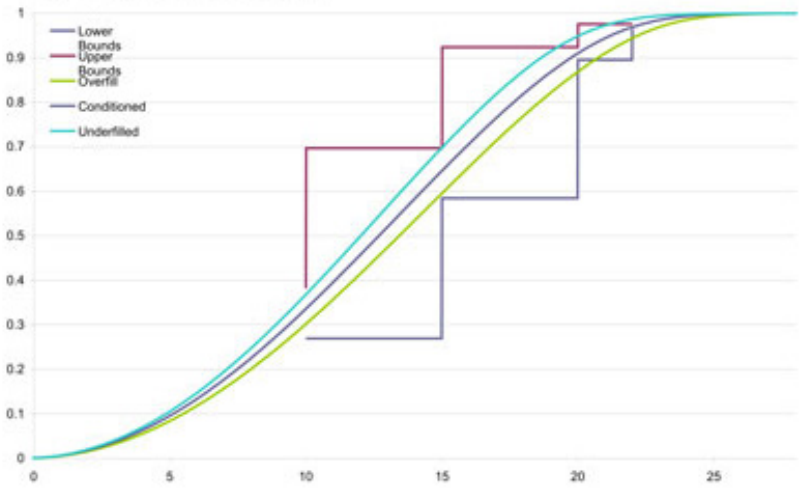
online resources

Table of Contents

Overview

The OptoTest **OP752-MOD Multichannel Modal Conditioner** quickly meets critical launch condition requirements like Encircled Flux, M80 or 70/70 fill for multichannel test setups. When used in conjunction with the OptoTest Multichannel LED Sources (OP750 Series) or Return Loss Meters (OP940 Series), launch conditions can be met without the need for external mandrel wraps, providing a specified launch in accordance with IEEE802.3AE and IEC 61280-4-1 Annex E. Each **OP752-MOD Modal Conditioner** manages launch conditions for up to 12 channels and additional units can be added for 24, 48 and up to 200 channels. Choose from common front panel connectors such as FC and SC with UPC or APC polish.

The launch control for each OP752 is tailored specifically for one source and the OP752 is then used in the calibration of that unit. Available with each OP752 is a report, such as the one below, detailing the exact launch condition created with the specified source.



Example of a report detailing the launch condition created with a specific source.

Initial Preparation

Unpacking and Inspection

The unit was carefully inspected; mechanically, electrically, and optically before shipment. When received, the shipping carton should contain the items listed in Standard Contents; account for and inspect each item. In the event of a damaged instrument, write or call OptoTest Corp, California.

Note: Be aware that accessories such as detector adapters, remote head detectors, and high performance reference cables will be located inside a small box labeled "Accessories Inside". If this box is not included with the original shipment, contact OptoTest or their nearest distributor.

Please retain the shipping container in case re-shipment is required for any reason.

Damaged In Shipment

All instruments are shipped F.O.B. Camarillo when ordered from OptoTest.
If you receive a damaged instrument you should:

1. Report the damage to your shipper immediately.
2. Inform OptoTest Corporation.
3. Save all shipping cartons.

Failure to follow this procedure may affect your claim for compensation.

Standard Contents

1. Model OP752 Multichannel Modal Conditioner
2. Certificate of Calibration and, if requested, the Metrology Report
3. Instruction Manual(s)
4. Rackmount Kit (optional)

Definition of Specifications

Dynamic Range

The dynamic range, or measurement range, of the optical power meter spans from the maximal power level the instrument can measure, without major saturation to the detector, to the minimal power level where the thermal noise of the detector becomes greater than the current produced by the incident light. For accurate power measurements, it is NOT recommended to measure power levels at either end of the dynamic range (see Linearity). The dynamic range is measured by comparing the absolute measured power against a reference power. When the difference between the two exceeds 1dB either end of the dynamic range has been reached.

Linearity

Photodetectors are, by nature, very linear over a wide range of optical input powers, but the power meter electronics can affect the overall system linearity. The power meter linearity is characterized and specified to know the measurement accuracy and linearity over the full dynamic range. For accurate insertion loss measurements only power levels that fall within the range with the best linearity (+/-0.05dB or better) should be measured.

Calibration Wavelength

The calibration wavelengths are the nominal wavelengths of the instrument's calibration points. The exact wavelength of each particular calibration is stated in the Certificate of Calibration.

Calibration Traceability

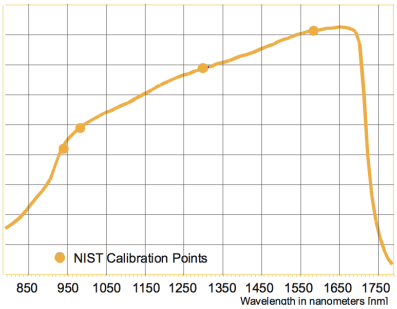
The detector's absolute calibration data is directly traceable to N.I.S.T. at the specified calibration wavelength and the specified power level, typically -10dBm.

Definition of Specifications

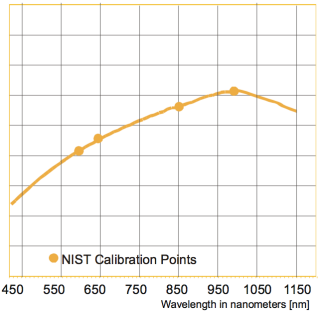
Spectral Responsivity

Depending on the detector type, InGaAs (Indium Gallium Arsenide) or Silicon the spectral responsivity, the efficiency of the detector to convert optical power into electrical current, changes with wavelength.

Responsivity of InGaAs Detectors



Responsivity of Silicon Detectors



Note that other detector types are available such as IN5 (5mm InGaAs) IN10 (10mm InGaAs) as well as WSR (wide spectral range) and might exhibit a different spectral responsivity.

Absolute Accuracy

The absolute accuracy specification includes the total measurement uncertainties involved in the calibration process including the transfer of the absolute power standard from N.I.S.T. (Contact OptoTest for the detailed chain of uncertainties)

Optical Power Meter, Channel Performance

For multichannel instruments, the power meter circuit converts and digitizes the optical power level with the given sampling interval. Changes in light levels such as modulation will be averaged within that sampling interval.

Instrument, Warm-up Time

Optical power meters, in general, do not need any warm-up time unless the instrument has to acclimate to a changing environment. In order to calibrate the instrument or to perform stable measurements, the instrument should be acclimated for 15 minutes for each 5ºC of temperature differential. For example, if the instrument was stored at 18ºC and brought into an environment of 28ºC the instrument should be allowed to warm-up for 30 minutes.

Definition of Specifications

Recommended Recalibration Period

This is the recommended time period for re-calibration in order to maintain accuracy specifications. The recommendation is made based upon statistics on detector aging. However, it is up to the metrology policies and procedures within each company to define the calibration cycles on optical power meters.

Optical Power Meter, Fiber Compatibility

The amount of areal coverage of the detector, or the portion of the light emitted from the fiber being measured, depends on the mechanical features of the optical interface, the active area of the detector and the numerical aperture (NA) of the fiber. A fiber with a large NA, for example 100/140 multimode fiber, may not underfill a small area detector hence the absolute power reading will be less than actual.

Return Loss Range

The lower end of the return loss (low return loss = high reflection) defines the level where the instrument is saturated by large reflections. The higher end of the return loss (high return loss = very weak reflections) is given by capability of the instrument to amplify and resolve reflection out of the noise floor.

Return Loss Accuracy

The Return Loss Accuracy is measured using an optical variable attenuator connected to a >98% reflector. The insertion loss of the attenuator is initially quantified against a reference optical power meter. The actual attenuation is then used to calculate the generated reflection, where the resulting reflection = 2x (variable attenuation + insertion loss of attenuator) + reflector coefficient. Accuracy of return loss measurements can also be affected by the reference cable and any excessive losses at the front panel interface.

Definition of Specifications

Reference Cable

The reference cable is the cable with which the DUTs will be measured against. Typically reference cables are required to be of a defined quality with a specified connector/endface polish.

Instrument, Environmental

Operating Temperature: This is the temperature range in which the instrument will conform to the specifications after the specified warm-up time.

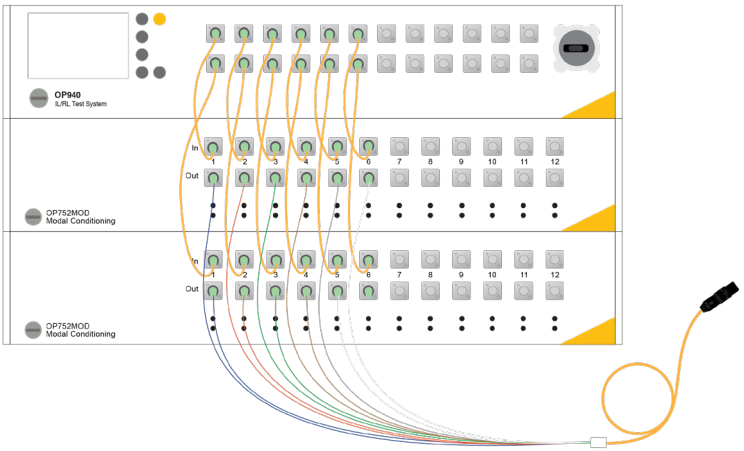
Storage Temperature: This is the temperature range at which the instrument can be stored with the power off without any damage or any loss of specification to the instrument. It is required that the instrument be brought back to within the operating temperature range before it is turned on.

Humidity: The relative non-condensing humidity levels allowed in the operating temperature range.

Unit Operation

The input and output ports for the OP752-MOD have 50um fiber with FC-APC connectors. An FC-APC to FC-APC cable of 62.5/125um fiber or 50/125um fiber can be connected from the source to the input port for each channel. The output fiber must be a 50/125um for the launch to adhere to the proper specifications. The configurations of fibers internal to the OP752-MOD are bidirectional, so one can swap the input and output connectors if needed for a clean fiber setup.

It is also recommended that short jumper cables are connected to the input and output ports of the OP752-MOD so as not to scratch the interfaces of the ports. Scratched interfaces can cause unwanted reflections, which could interfere with return loss measurements.



24-ch OP940 and Two 12-ch OP752-MODs with 12 channels shown.

Warranty Information

See our Terms and Conditions at www.optotest.com for warranty information.

NOTE: Do not send instruments for any reason without contacting OptoTest headquarters first. To request an RMA contact OptoTest at +1.805.987.1700 or customerservice@optotest.com.

www.optotest.com
1.805.987.1700