

1500

CALIBRATION POWER METER

IQS-1500

R&D AND MANUFACTURING



- Operates in the WDM window
- Enables on-site power-meter calibration
- Linearity of ± 0.01 dB
- 5 mm cooled detector

Delivering Accurate Power Measurements

Enjoy exceptional performance, flexibility, ease of use and extensive integration capabilities with EXFO's IQS-1500 Calibration Power Meter. Like all IQS products, this module features PC-based software and a standardized graphical user interface (GUI). What's more, the IQS-1500 offers very low uncertainty ($\pm 2\%$ to 3%) and high-performance linearity (± 0.01 dB). The Q1 model is calibrated at the National Institute of Standards and Technology (NIST), providing an uncertainty of as little as 0.9% for three user-selected wavelengths.

The IQS-1500 comes with a 5 mm cooled germanium detector (750 nm to 1800 nm), delivering high accuracy—even at unstable temperatures—over a wide dynamic range.



Enabling In-House Verification and Calibration of Power Meters

Combine the IQS-1500 with the IQS-2400 WDM Laser Source (DFB laser) to perform in-house power-meter verification and calibration. The NIST-calibrated IQS-1500-Q1 model provides $< \pm 0.9\%$ uncertainty at reference conditions, which enables local calibration of all optical power meters.

Because its central wavelength can easily be pinpointed, a DFB laser source such as the IQS-2400 is ideal for calibrating both at 1310 nm and 1550 nm. Use its coherence control setting to modulate the signal, therefore minimizing interference.

The IQS Solution: The Easy Way to First-Class Calibration

Housed in the IQS-500 Intelligent Test System, the IQS-1500 Calibration Power Meter features user-friendly, flexible, Windows-compatible software. Easily select all configuration parameters from a single setup window.

Choose from two operation modes: standard power measurement or calibration. A complete step-by-step procedure guides you through the power-meter calibration operation, resulting in systematic, repeatable and scientifically valid results. Experienced users can access individual steps directly from the main window.

This procedure yields a detailed calibration report (in HTML format), with total calibration uncertainty for each calibrated wavelength. Data can be saved on a floppy disk, the system's hard drive or a remote controller station, making storage space practically limitless. Thanks to Windows-based software, the IQS-1500 can work with any compatible system.



A typical power-measurement setup.

Calibration Mode

The IQS-1500's Windows-compatible, highly intuitive GUI allows easy control via mouse, touchscreen or keyboard. Also, it lets you save multiple user configurations and access the instrument's online user guide.

A Start

Allows the user to select the calibration mode, start a new calibration sequence with template file or view a report file.

B Information

Allows the user to enter general and specific information about current measurement conditions. This information will be included in the calibration summary.

C General

Contains user and module information currently used to perform calibration.

D Conditions

Contains all the information pertaining to the conditions at which the calibration is performed: source wavelength, power and bandwidth, temperature and humidity.

E Device under Test (DUT)

Contains all the information pertaining to the DUT under calibration.

F Uncertainties

Allows the user to enter specific information pertaining to the calculation of the calibration uncertainty.

G Null

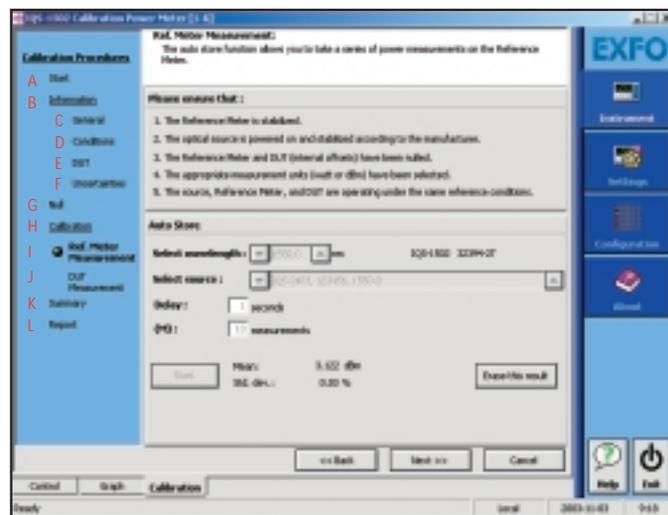
Allows the user to eliminate electronic offsets and dark currents to ensure accuracy.

H Calibration

Allows the user to perform calibration measurements and calculation.

I Ref. Meter Measurement

This auto-save function allows the user to select the number of measurements and the intervals between readings for automated measurements on the reference power meter (IQS-1500).



J DUT Measurements

Allows the user to enter DUT power measurements.

K Summary

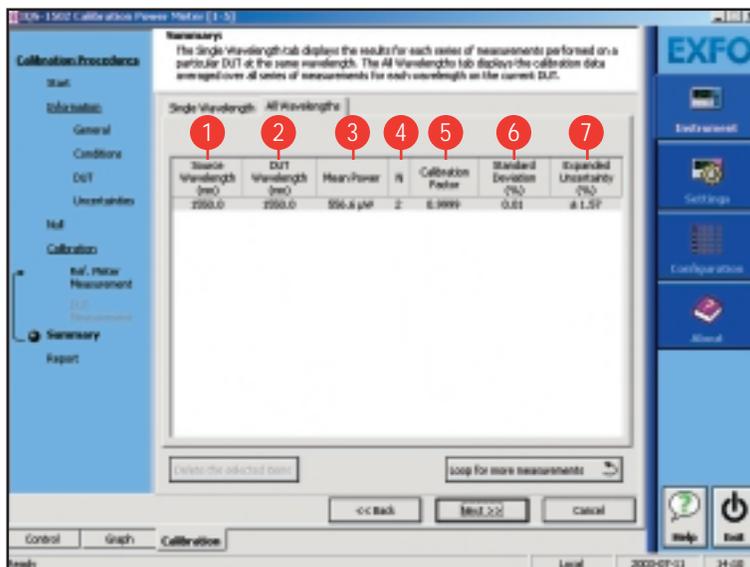
Displays complete calibration results, including mean power, calibration factor and total uncertainty.

L Detailed calibration reports

Generates detailed calibration reports that include instrumentation identification, environmental information, reference conditions and a calibration summary for each wavelength.

The IQS-1500's Summary Window

- 1 Source wavelength
- 2 Wavelength setting of power meter under test
- 3 Mean power measured by the IQS-1500
- 4 Number of calibration measurements



- 5 Calibration factor for DUT readings (in W)
- 6 Standard deviation of the calibration factor
- 7 Expanded uncertainty of corrected DUT readings

SPECIFICATIONS¹

Model	IQS-1502-Q0	IQS-1502-Q1
Detector type	Ge	Ge
Detector size (mm)	5	5
Power range ¹ (dBm)	+5 to -60	+5 to -60
Wavelength range (nm)	750 to 1800	750 to 1800
Linearity ^{1,2} (dB)	± 0.01 (+5 dBm to -50 dBm)	± 0.01 (+5 dBm to -50 dBm)
Uncertainty ⁶	± 2 % ³ (at 1310.0 ± 0.1 nm and 1550.0 ± 0.1 nm) (0 dBm to -10 dBm CW)	≤ ± 0.9 % ⁴ at 3 λ (-10 dBm CW)
	± 3 % ³ (750 nm to 1700 nm) (-30 dBm to -40 dBm CW)	± 3 % ⁴ (750 nm to 1700 nm) (-30 dBm to -40 dBm CW)
Power resolution (dB)	0.001	0.001
Wavelength resolution (nm)	0.1	0.1
Applicable fiber type (μm)	9/125 (B); 50/125 (C); 62.5/125 (D)	9/125 (B); 50/125 (C); 62.5/125 (D)
Connector type ⁵	B: 89	B: 58; 88; 89; 90; 91 C/D: 50; 54; 74

GENERAL SPECIFICATIONS

Size (H × W × D)	12.5 cm × 3.6 cm × 28.2 cm	(4 ¹⁵ / ₁₆ in × 1 ⁷ / ₁₆ in × 11 ¹ / ₈ in)
Weight	0.63 kg	(1.4 lb)
Temperature operating	23 °C ± 5 °C	(73 °F ± 9 °F)
storage	-40 °C to 70 °C	(-40 °F to 158 °F)
Relative humidity	0 % to 80 % non-condensing	

ORDERING INFORMATION

IQS-150X-XX-X-XX

Model

IQS-1502-Q0-B = 5 mm TEC-Ge detector, 2 % uncertainty at (1310 ± 0.1) nm and (1550 ± 0.1) nm, Singlemode 9/125 μm⁷

IQS-1502-Q1-B = 5 mm TEC-Ge detector, 0.9 % uncertainty calibrated at NIST, Singlemode 9/125 μm

IQS-1502-Q1-C = 5 mm TEC-Ge detector, 0.9 % uncertainty calibrated at NIST, Multimode 50/125 μm

IQS-1502-Q1-D = 5 mm TEC-Ge detector, 0.9 % uncertainty calibrated at NIST, Multimode 62.5/125 μm

Test jumper connector

50 = FC/PC⁹

54 = SC/PC⁹

58 = FC/APC narrow key⁸

74 = ST/PC⁹

88 = SC/APC⁸

89 = FC/UPC narrow key⁸

90 = ST/UPC⁸

91 = SC/UPC⁸

Example: IQS-1502-Q1-B-89

STANDARD ACCESSORIES

User guide, fiber-optic adapter (FOA), one reference test jumper and Certificate of Calibration

Notes

- At 1310 nm and 1550 nm.
- At a ± 1 °C constant temperature.
- Q0 option, uncertainty at EXFO reference conditions:
 - ± 2 % uncertainty at (1310.0 ± 0.1) nm and (1550.0 ± 0.1) nm, with 9/125 μm (B) fiber, and source spectral width (FWHM) < 10 nm.
 - ± 3 % uncertainty from 750 nm to 1700 nm, with 62.5/125 μm (D) fiber, and source spectral width (FWHM) ≤ 12 nm.
 - FC/UPC connector (ceramic ferrule) with FOA-322.
- Q1 option, calibration at NIST
 - ≤ ± 0.9 % uncertainty at three user-specified wavelengths within the following ranges at NIST reference conditions:
 - 786 nm ± 0.5 nm
 - (840 to 860) nm ± 0.25 nm
 - (1280 to 1330) nm ± 0.25 nm
 - (1520 to 1625) nm ± 0.25 nm
 - 9/125 to 62.5/125 μm (B to D) fiber.
 - FC, ST or SC connector.
 - Fiber-optic adapter (FOA) used at NIST.
 - Source spectral width (FWHM) < 10 nm.
- ± 3 % uncertainty from 750 nm to 1700 nm, 62.5/125 μm (D) fiber, source spectral width (FWHM) < 12 nm, and FC/UPC connector (ceramic ferrule) with FOA-322.
- See Ordering Information for details.
- All uncertainties are valid on the day of calibration after a warm-up time of 20 minutes, and specified with a 95 % confidence level.
- Test jumper FC/UPC only
- Singlemode only
- Multimode only

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EXFO is certified ISO 9001 and attests to the quality of these products. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. EXFO has made every effort to ensure that the information contained in this specification sheet is accurate. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics and products at any time without obligation. Units of measurement in this document conform to SI standards and practices. Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor. For the most recent version of this spec sheet, please go to the EXFO website at <http://www.exfo.com/specs>. In case of discrepancy, the Web version takes precedence over any printed literature.