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IQ-3400

PDL/Optical Loss Meter



- Complete loss analysis solution
- High resolution: 0.001 dB
- Impressive measurement speed
- Acquisition rate: up to 2500 samples per second
- Wide spectral range:1200 - 1625 nm
- Single- (1310 nm, 1550 nm) and dual-wavelength (1310/1550 nm) configurations.

EXFO

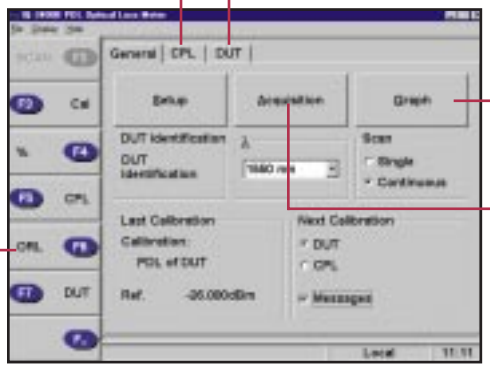
Complete PDL/Optical Loss

Complete Loss Analysis

In today's competitive fiber-optic industry, quick and easy-to-use solutions are necessary for component characterization in wide-bandwidth, high-speed applications. With the touch of a single button, the IQ-3400 can perform complete component characterization with the following measurements: polarization dependent loss; insertion loss; optical return loss; excess loss; coupling ratio; polarization dependent coupling ratio; and reference power. Standard deviation, averaging and a graphical interface allow for complete component characterization.

Coupler test mode allows for complete characterization of optical couplers through the following measurements: coupling ratio, polarization dependent coupling ratio, excess loss, reference power, and insertion loss. This setup permits easy one connection testing of 1 x 2 and 2 x 2 couplers.

ORL characterization of optical components is made possible through ORL test mode. The IQ-3400 is ideal for component reflectance measurements in manufacturing.



Main Window

DUT test mode allows for complete PDL/PDG characterization of optical componentsincluding insertion loss and referen-ce power. Average PDL/PDG and standard deviation PDL/PDG are provided for a complete DUT analysis.

Powerful graphical interface for statistical PDL/PDG measurements

Different data acquisition modes, averaging and sampling periods offer flexibility for many applications, including statistical data collection; component pass/fail testing; quality control; and design testing.

The IQ Solution

EXFO has combined component loss and PDL/PDG testing into the IQ-200 Integrated Test System. The IQ-3400 PDL/Optical Loss Meter incorporates highly precise power measurement technology with a highly rapid polarization controller to provide you with a user-friendly module designed for rapid and flexible loss measurements. The IQ-3400 comes complete with Windows™ software for accurate source reference power and complete component loss measurements. A powerful graphical interface allows for easy statistical measurements over time. Different data acquisition modes, averaging and sampling periods offer flexibility for many applications, including statistical data collection, component pass/fail testing, quality control, and design testing.



IQ PDL/OL Meter Setup

Integrated Test System

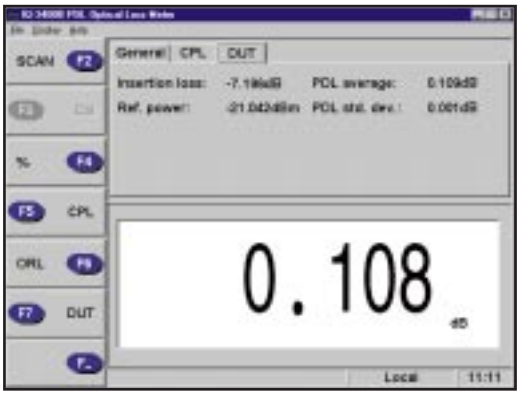
What is PDL?

Polarization dependent loss (PDL) consists of the maximum optical component insertion loss variation caused by changes in the polarization state of input light.
Accumulation of component PDL produces wide variations in a system's optical power. These variations are caused by changes in the environmental conditions under which the optical system works.
In addition, the cumulative system attenuation is not equivalent to the sum of component polarization dependent losses. The first component of the system changes the polarization state of the second component, thus affecting its loss. In some cases, the changes in the state of polarization may create what is called polarization dependent gain (PDG) for certain components of the optical system. Therefore, the PDL or PDG of the second component will depend, in part, on the relative orientation of both components and on the rotation of the polarization state created by the connecting fiber.

Why is PDL Important?

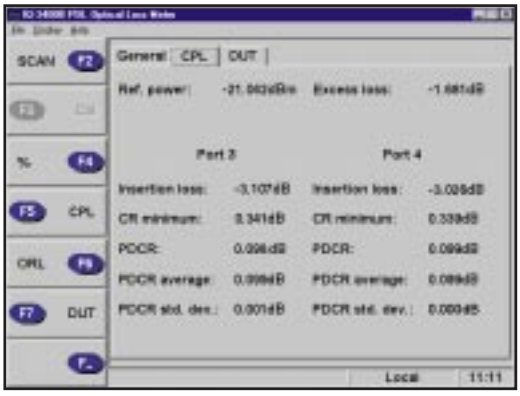
Variation in system attenuation caused by PDL/PDG affects the characterization of optical components in light systems. Lightwave systems with optical amplifiers, for example, are vulnerable to performance degradation caused by PDL or PDG.
PDL may be caused by optical components such as attenuators, isolators, or couplers, whereas PDG maybe caused by polarization hole burning in optical amplifiers. PDL and PDG cause a polarized signal to be attenuated or amplified differently from the unpolarized noise. This difference changes the signal-to-noise ratio (SNR) at the system output and results in performance degradation.

Furthermore, since the state of polarization of the transmitted light is changed randomly, PDL and PDG may cause system performance to fluctuate over time.



DUT Mode

Measurements available are:
- Insertion Loss
- Polarization Dependent Loss
- Reference Power
- Average and Standard Deviation



Coupler Mode

Measurements available are:
- Coupling Ratio
- Polarization Dependent Coupling Ratio
- Excess Loss
- Insertion Loss
- Reference Power
- Average and Standard Deviation

SOURCE SPECIFICATIONS[4]

Type	LED Singlemode Polarized, DFB or External Source[5]
LED option (nm)	1310 +20/-25, 1550 +10/-40, 1310/1550 +20/-25 +10/-40
Wavelength DFB option (nm)[1]	1310 ±10 or 1550 ±10

GENERAL

Wavelength range (nm)	1200 to 1625
Resolution (dB)	0.01/0.001
Fiber (µm)	9/125

PDL/PDG Measurements

PDL absolute accuracy	± 0.015+ 5% of PDL
PDL repeatability	±0.0025+ 5% of PDL
Measurement speed (sec)	5 (typical)
Measurement rate	2500 per second
PDL range (dB)[2]	0.015 to 5 (0.015 to 20 with DFB option)

Polarization Dependent Coupling Ratio (PDCR) Measurements

PDCR absolute accuracy (dB)	± 0.005+ 10% of PDCR
PDCR repeatability (dB)	±0.001+ 10% of PDCR
Measurement speed (sec)	5 (typical)
Measurement rate	2500 per second
PDCR range (dB)[2]	0.005 to 5 (0.005 to 20 with DFB option)

Insertion Loss and Reference Power Measurements

Insertion loss accuracy (dB)[6]	± 0.05
Reference power accuracy (dBm)	± 0.2 (±5%)

ORL Measurements[3]

Dynamic range (dB)	0 to -45
Absolute accuracy (dB)	< ± 0.25[7]
Polarization sensitivity (dB)	0.01

Environmental Specifications

Operating temperature	32° to 122°F / 0° to 50°C
Storage temperature	-40° to 158°F / -40° to 70°C
Relative humidity	0 to 95% non-condensing

ORDERING INFORMATION

IQ-34-XX[8]

Connector Code

58 = FC/APC 88 = SC/APC
91 = SC/UPC 89 = FC/UPC

STANDARD ACESSORIES

- 1 Reference Jumper
- IQ-3400 Instruction Manual
- Certificate of Quality

EXFO has made every effort to ensure that the information contained in this brochure 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.

NOTE

1. DFB with spectral width ≤ 0.2 nm at -3 dB.
2. Higher ranges are achieved with acuracy degradation or the use of a DFB laser.
3. ORL specifications require FP-ORL Source.
4. Source specifications for PDL/PDG or PDCR measurements.
5. External source with spectral width ≤ 0.2 nm at -3 dB.
6. For Insertion Loss measurements in coupler mode IL accuracy is ±0.05 + PDCR of measured coupler.
7. For 0 to -25 dB range.
8. C_1 connector requires APC finish;
   C_2 and REF connectors require UPC finish.

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