Passive Component Environmental Test System

IQ-12003

Temperature- and humidity-based environmental testing for

- Insertion loss
- Loss drift over time
- Optical return loss
- Polarization-dependent loss

Fiber-optic test, measurement and monitoring instruments

EXFO

Integrated Solutions For Environmental Testing

Perform environmental tests based on temperature and humidity changes such as extended thermal age, extended humidity and thermal cycle as well as temperature humidity cycle with the IQ-12003 Passive Component Environmental Test System. This automated test system monitors IL, ORL and PDL performance during passive component environmental stress tests.

The IQ-12003 Passive Component Environmental Test System monitors temperature and humidity with standard probes. Six thermocouples and one hygrometer send environmental data to the test application, which compiles these results along with performance data about the device under test (DUT). The result: valuable correlation between environmental stress conditions and the behavior of the DUT.

Key Features

- Accurate, repeatable results
- Complete environmental characterization
- Comprehensive data management
- Supervisor and operator access levels

Scalable and future-proof

The IQ-12003 Passive Component Environmental Test System is based on EXFO's flexible IQ-200 Optical Test System platform and powerful Visual IQ software. Assembling different configurations for the IQ-12003 is easy with EXFO's wide variety of test modules. Start with a basic system and expand to a more sophisticated setup without having to modify or upgrade the software.

Customize Your System

The IQ-200 Optical Test System is EXFO's flexible, system-based approach to optical test and measurement. It combines PC benefits with seamless module interaction to make complex, integrated systems work like a single instrument.

Platforms

Control Unit—Oversee the measurement process, data interpretation and data storage IBM PC.
LAN connectivity is standard.

IQ-206 Expansion Unit—House the test instruments you need in the IQ-206 Expansion Unit. Up to four expansion units may be connected to the IBM PC.

Modules

IQ-2400 WDM Laser Source

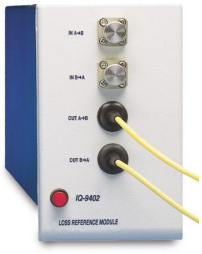
Execute all the defined tests with the IQ-2400 WDM Laser Source. Measure insertion loss and return loss by modulating and depolarizing the output signal. Measure PDL by modifying the polarization state with the IQ-5100 Polarization Controller.

IQ-9700 Depolarizer

Condition the IQ-2400 or IQ-2100-ORL laser signal with the IQ-9700 Depolarizer while performing IL and ORL measurements.

IQ-5100 Polarization Controller

Scan the entire Poincaré sphere and produce all states of polarization to determine PDL with the IQ-5100 Polarization Controller. PDL is determined from the minimum and maximum loss levels via the measurement performed during the scan.



IQ-9402 Loss Reference Module

Perform numerous functions with the IQ-9402 Loss Reference Module. Measure transmitted power, provide a continuous dynamic power reference, ensure measurement accuracy and perform ORL and PDL measurements.

IQ-9100 Optical Switch

Use the IQ-9100 Optical Switch to direct a signal through the system's optical conditioning to the IQ-9402 Loss Reference Module. Then, direct the signal through each of the device channels as defined during the test setup phase.

Internal System Bus

The automated test system's components communicate through the internal system bus, a faster and more efficient method than GPIB, DAQ and other data-transfer interfaces.

Visual IQ Software Benefits

Visual IQ software controls all instrument functions from start to finish. Ensure repeatable results with this comprehensive, systematic test procedure software. Features include automatic Pass/Fail flags, a device database and flexible test configurations that simplifies passive component qualification. Protective barriers ensure test results are saved; in case of power failure or accidental shutdown, simply restart the test where you left off. Even the most complex and time-consuming environmental test is quickly configured and set in motion. Retrieve, analyze, monitor and print data at anytime during the test.

Configure

Configure a component database, including all the different devices to undergo environmental qualification, from your desktop workstation by completing two easy screens:

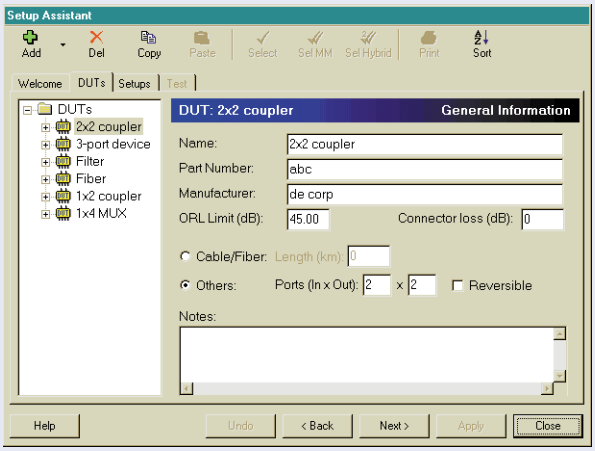
1. DUT
- physical description of the DUT
- part number
- required Pass/Fail limits for each parameter to be tested

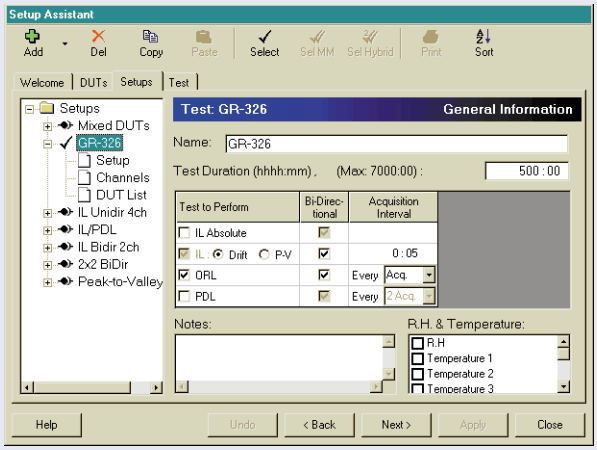
2. Setups
- number of devices
- test duration
- delay between cycles
- parameters to be measured
- measurement direction (end-to-end or bidirectional)

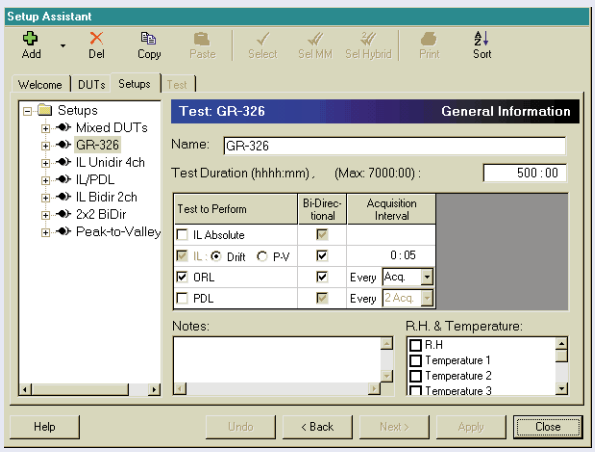
A customer database is also available

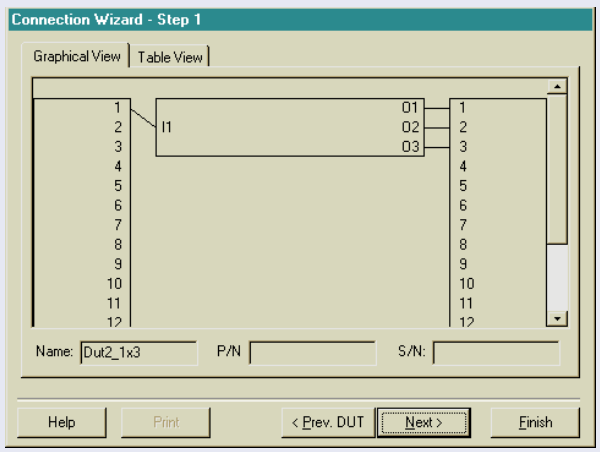
Select

Simply select the test to be performed. Connect the devices according to the previously established instructions. Start the test.





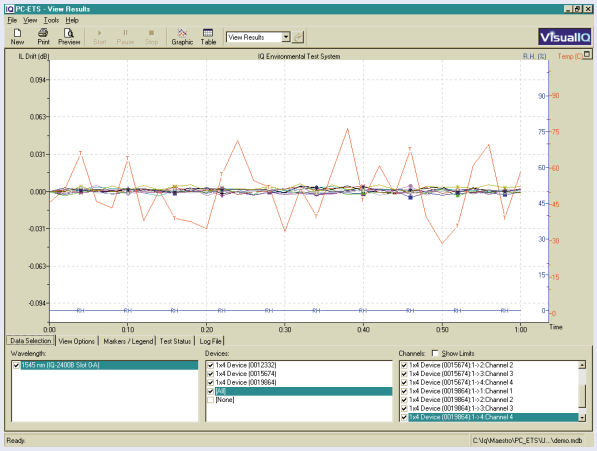


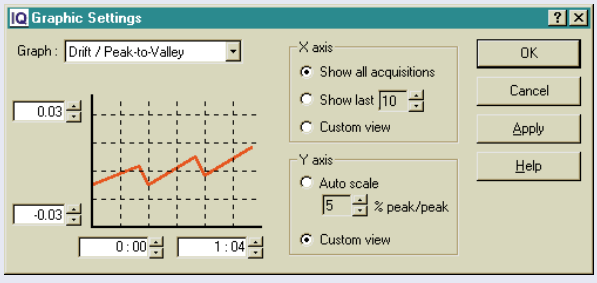


Test

Automatically perform tests for the defined duration with the IQ-12003. Results are updated after each acquisition cycle and the Pass/Fail indicator provides instant DUT performance status.

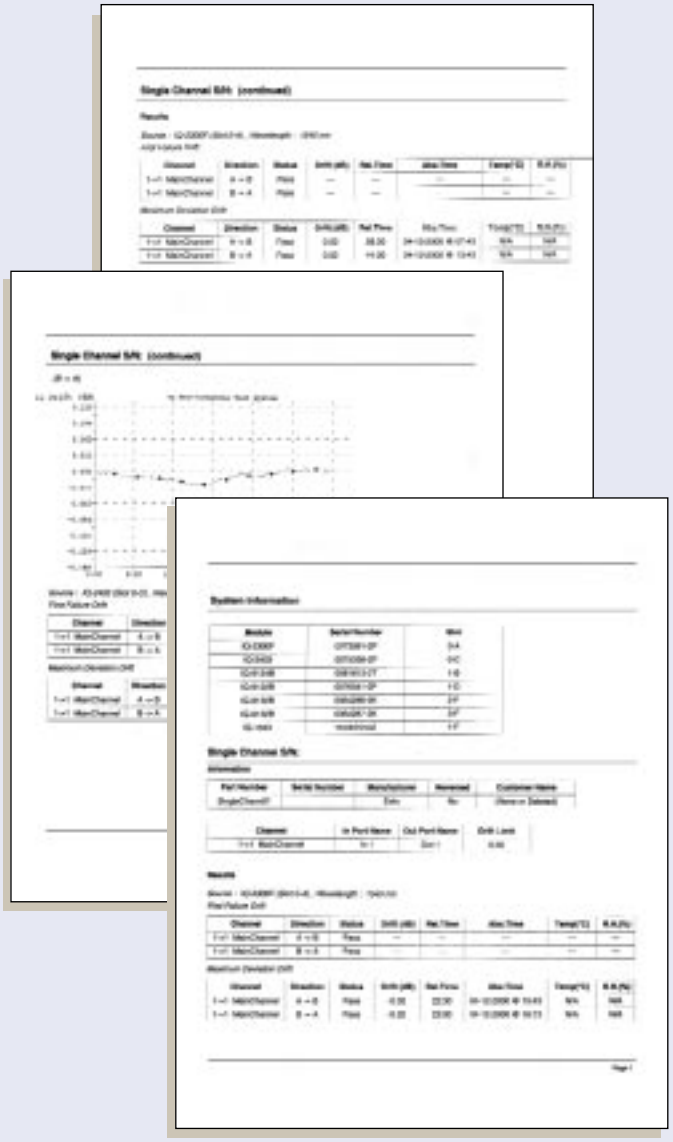
Obtain additional details for better interpretation of the graphical test results with the Graphic Settings tool. Drift, ORL and PDL values, along with their correlated temperature and humidity values, are presented as a function of time. View variable scales and markers on the graphical display; customize the display for a channel, a group of channels or with respect to wavelength.





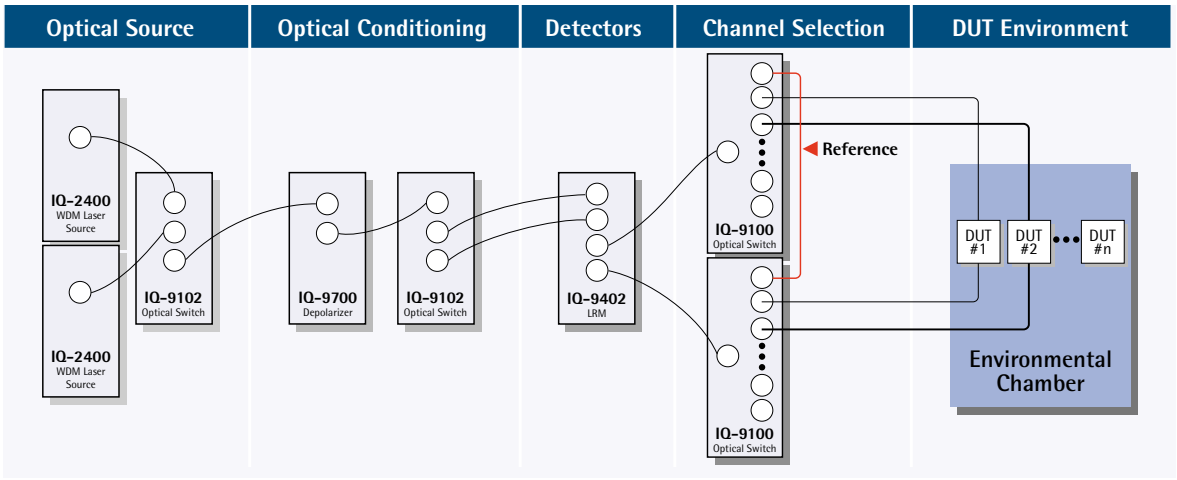
Manage Data

Use the Microsoft database (MDB), an Access™-compatible automated application, to store results in a separate database for each system. Store databases on each test station or connect to a LAN for storage on any network drive. Test data can also be exported to delimited .TXT format, which is compatible with several storage and analysis programs.

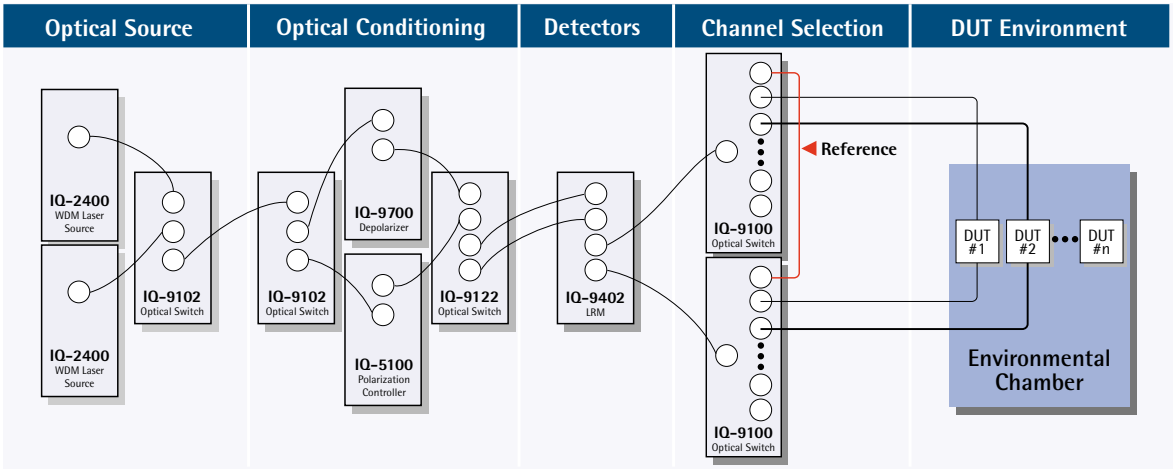


System Overview

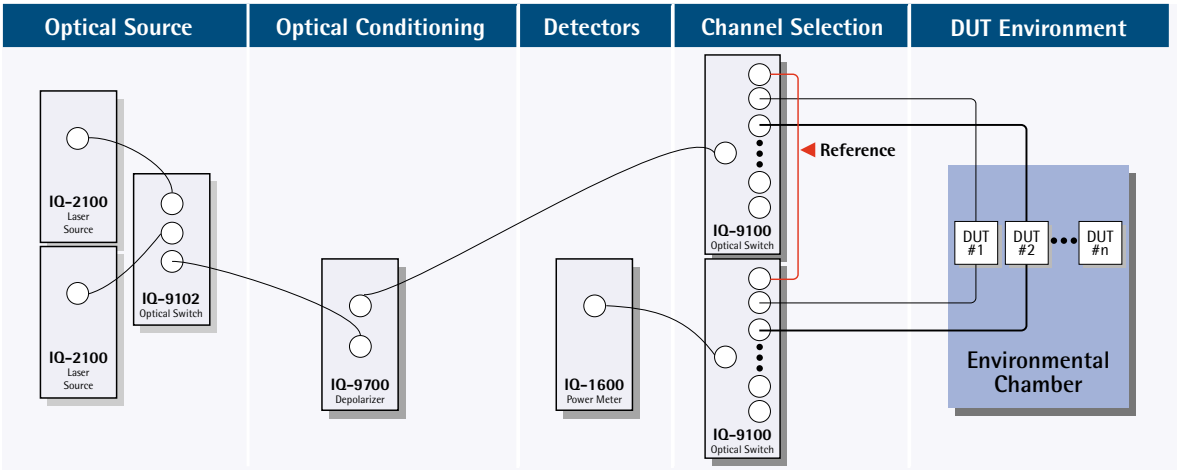
Prior to entering the DUT environment, the signal passes through a number of different stages. EXFO has obtained high system stability by channeling the signal through optical conditioning, then a first detection stage. Three measurement configurations address all environmental testing requirements. Whether you require a drift-only setup or a PDL setup, EXFO delivers the high-quality measurements you've come to expect.



IL, drift and ORL measurement setup



IL, drift, ORL and PDL measurement setup



IL and drift measurement setup

Measurements

Measurement	Details
IL	Insertion loss is calculated at the central wavelength. Using the cutback method, splice and connector loss may be accurately calculated at the end of the test.
Drift	Insertion loss variation for each channel is measured as a function of time and correlated to temperature and humidity variations.
ORL	ORL measurements for each channel need no device manipulations. An initial calibration stage is necessary to obtain accurate results.
PDL	PDL measurements are performed at the selected wavelength using the polarization scanning method. Device manipulations are not required for the measurement.
Temperature	Temperature measurements are made through the provided thermocouples. Up to six temperature channels can be monitored at the same time. Thermocouple uncertainty is ± 0.7 °C over the –100 °C to +100 °C temperature range.
Humidity	The state-of-the-art hygrometer offers a reading uncertainty of ± 3 % over the 0 % to 100 % relative humidity range and the -40 °C to 125 °C temperature range.

Specifications

System	
Testing time	~3 seconds for IL measurements, including channel selection, calculations and storage time.
Loss measurement uncertainty[1, 2, 3, 4]	± 0.1 dB (0 to 45 dB loss)
Loss measurement stability (2σ)[1, 2]	± 0.05 dB over 100 hours
ORL range[4, 5]	> 55 dB
ORL measurement uncertainty[1, 2, 3, 4]	± 1 dB from 15 to 55 dB
ORL measurement stability (2σ)[1, 2, 4]	± 0.05 dB over 100 hours from 15 to 50 dB
PDL measurement uncertainty[3, 4, 6]	± 0.2 dB
PDL measurement stability (2σ)[4, 6]	± 0.03 dB over 100 hours
Wavelength[5]	850 nm, 1300 nm, 1310 nm, 1550 nm
Detectors dynamic range	> 85 dB
Temperature uncertainty	± 0.7 °C
Humidity uncertainty	± 3 %

General Specifications

Dimensions (HxWxD)	188 cm x 61 cm x 81 cm	(71 in x 24 in x 32 in)
Weight	136 kg	(300 lb)
Environmental conditions	Working temperature range: 15 °C to 27 °C Relative humidity: 0 to 80 % non-condensing, at working temperature Storage temperature: -20 °C to 60 °C	

Options

Low ORL option for switches
Environmental chamber integration
Wavelengths in the 1510 nm to 1612 nm range
Multitasking capability, sharing hardware with up to three environmental chambers
External source (XS) working in the 1270 nm to 1350 nm and 1529 nm to 1565 nm ranges

Notes

1. Does not include connector or connector-adapter uncertainties.
2. Obtained with a depolarized IQ-2400 source and EXFO switches.
3. Reported with a 95 % confidence level.
4. For 0 dBm input power.
5. Splice and connector ORL must be better than 55 dB.
6. At 1550 nm using EXFO switches, for a 10 W loss (< 5 dB) component and PDL < 1 dB.

Ordering Information

For the system:

IQ-12003-01-Y-ZZ for IL only

Y is the fiber type
B = 9 µm (SM)
C = 50 µm (MM)
D = 62.5 µm (MM)

ZZ is the wavelength
01 = 850 nm (MM)
02 = 1300 nm (MM)
12 = 850/1300 nm (MM)
03 = 1310 nm (SM)
04 = 1550 nm (SM)
34 = 1310/1550 nm (SM)
XS = External source

IQ-12003-02-YY-ZZ for IL/ORL with or without PDL

YY is
P0 = Without PDL
P1 = With PDL

ZZ is the wavelength
03 = 1310 nm (SM)
04 = 1550 nm (SM)
34 = 1310/1550 nm (SM)
XS = External source

For the switch:

Specify the number of channels
12, 24, 32, 48, 64, 100, 120, 140, 180

the fiber type
9 µm, 50 µm or 62.5 µm

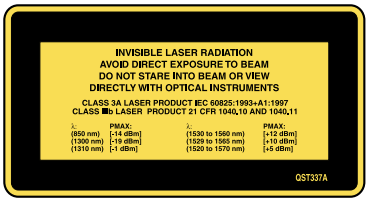
the connector type
Bulkhead FC/APC[1, 4]
Bulkhead FC/UPC[1, 5]
Pigtail 5 m with FC/APC connectors[2, 4]
Pigtail 5 m with FC/UPC connectors[3, 5]
Pigtail 5 m without connectors[6]

Notes
1. Includes one test jumper per channel.
2. Includes one connector per APC channel.
3. Includes one connector per UPC channel.
4. For APC: PDL test is possible but specifications are not guaranteed.
5. For UPC: ORL test is not possible.
6. For IQ-12003-01, IL system only.

Standard Accessories

Laser Safety Interface (LSI4)
Mainframe unit with keyboard, mouse, network card, OS
Expansion units as required
IQ-12003 software
TempBook/66 with 6 thermocouples and 1 hygrometer
Temperature-controlled rackmount
Connector cleaning kit: including Video Fiber Inspection Probe, FOMS Fiber-Optic Microscope, Reel CLEANER and carrying case
2 days on-site installation and training, all expenses included
Instruction manual
Interconnecting patchcords
Acceptance test plan
Certificate of Compliance

Safety



21 CFR 1040.10 Class IIIb Laser Product
IEC 60825-1 : Ed. 1.1 1998 Class 3A Laser Product

CORPORATE HEADQUARTERS	465 Godin Avenue	Vanier (Quebec) G1M 3G7 CANADA	Tel.: 1 418 683-0211 . Fax: 1 418 683-2170
EXFO AMERICA	1201 Richardson Drive, Suite 260	Richardson TX 75080 USA	Tel.: 1 800 663-3936 . Fax: 1 972 907-2297
EXFO EUROPE	Le Dynasteur, 10/12 rue Andras Beck	92366 Meudon la Forêt Cedex FRANCE	Tel.: +33.1.40.83.85.85 . Fax: +33.1.40.83.04.42
EXFO ASIA-PACIFIC	151 Chin Swee Road, #03-29 Manhattan House	SINGAPORE 169876	Tel.: +65 333 8241 . Fax: +65 333 8242
TOLL-FREE (USA and Canada)	Tel.: 1 800 663-3936	www.exfo.com • info@exfo.com	

SPIQ12003.5AN

Printed in Canada 01/12