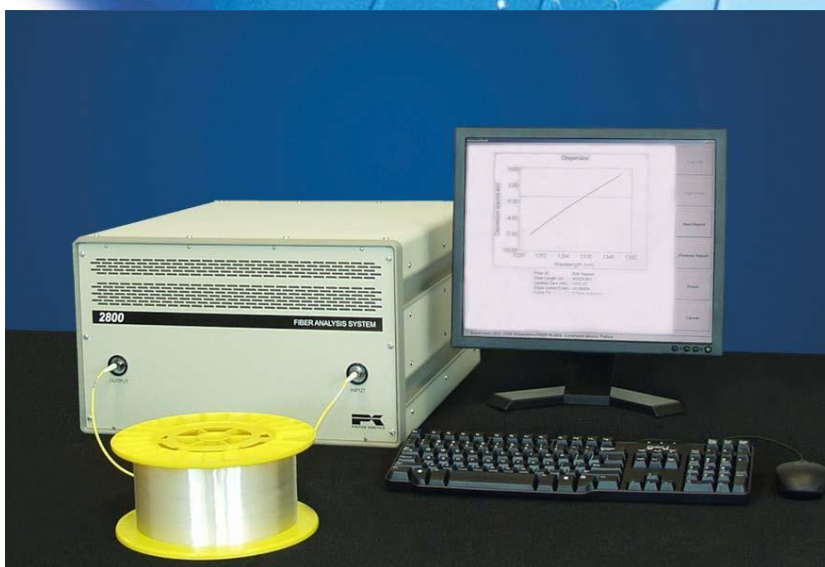


2800 Optical Fiber Analysis System



**A high performance platform
for single-mode and multimode fiber
measurements**

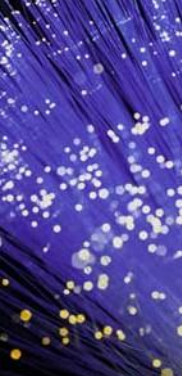
Chromatic Dispersion

Polarization Mode Dispersion

Fiber Strain

Skew

Bending Loss



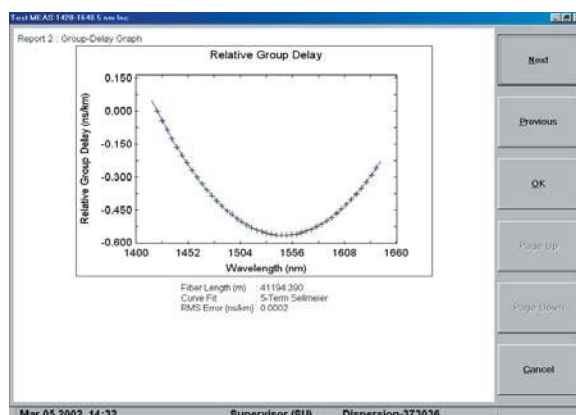
The 2800 Fiber Analysis System is a factory-proven fiber characterization platform that provides fiber and cable manufacturers with fast, accurate, reliable measurement of key multimode and single-mode fiber parameters including: chromatic dispersion, polarization mode dispersion, fiber length, strain, bending loss and cable skew. This range of measurement capability not only enables comprehensive fiber and cable testing, but measurement configurability allows manufacturers to deploy the right combination of measurement capability at every test station. The 2800's industry-leading measurement performance also makes it possible for manufacturers to obtain test results faster and more reliably than other test systems, facilitating both maximum production output and reduced manufacturing costs.

Features and Benefits

- Versatile platform expands deployment options
- High performance maximizes testing throughput, minimizes cost
- Factory-proven design ensures reliable operation

High Performance, Automated Measurements

The 2800 Fiber Analysis System combines the phase shift reference measurement technique with high dynamic range optical design to enable high speed acquisition of optical fiber group delay data, faster than any other chromatic dispersion measurement system. High speed data acquisition not only reduces measurement time, but it also allows users to configure the 2800 to acquire more group delay data in order to maximize CD measurement accuracy and repeatability without significantly increasing measurement time.



Group delay data from which chromatic dispersion is calculated.

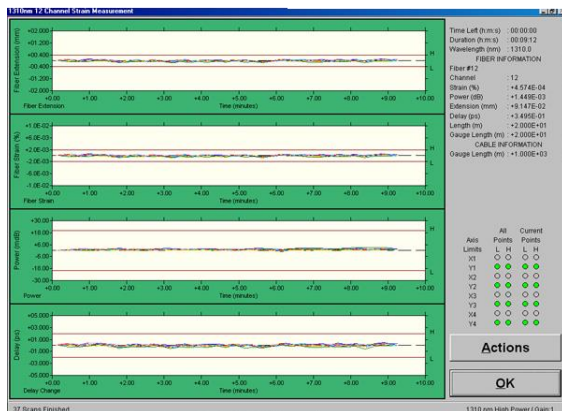
Whether you're measuring only chromatic dispersion or performing a variety of tests, the 2800 automated measurement sequence capability ensures that high speed data acquisition actually results in short measurement times and lower measurement cost. Measurements sequences are easily defined and modified to perform any combination of tests, with the specific measurement settings that you need in order to satisfy your particular measurement requirements.

More Than Chromatic Dispersion

The 2800 has established its ability to perform single-mode chromatic dispersion more quickly and with greater precision than competitive products. But chromatic dispersion measurement performance is just one of the 2800's industry leading capabilities. The 2800 also offers high performance measurement of other critical fiber parameters such as optical length and optionally, polarization mode dispersion. These three critical single-mode fiber properties can be measured with the same fiber setup - eliminating redundant fiber preparation and connection time. And, with the ability to accommodate up to 4 light sources, the 2800 offers this measurement capability across all standard single-mode telecommunications transmission bands from 1240 to 1650 nm, as well at specialty wavelengths such as 980 and 1060 nm.

In addition to characterizing standard single-mode fibers, the 2800 platform can also be configured to test multimode and even specialty single-mode fibers. The chromatic dispersion and length of glass or plastic multimode fibers, as well as "low cutoff" single-mode fibers can be characterized in the 650 nm, 850 nm or other wavelength regions of interest, with overfilled, underfilled or even customer-defined launch conditions.

The 2800 is also capable of performing measurements critical to cable manufacturers. Its Strain and Transmitted Power Monitoring Option is essential for the environmental and mechanical testing of both single and multimode fiber cables. The option is able to perform both discrete and continuous measurement of the strain and transmitted power of a single fiber, while also recording the voltage outputs from temperature, pressure, tensile or compressive load sensors. The strain and transmitted power of multiple fibers (up to 99) can be monitored automatically with the Multiplexed Strain Measurement Option.



2800 fiber strain and power option results screen

An Upgradeable Platform

Some test applications require a test instrument with specialized capability, such as a PMD-only test system. For other applications, or as your fiber characterization needs change, a multi-parameter test system that offers two or more 2800 measurement capabilities, such as PMD and chromatic dispersion, might be more useful.

With the 2800 Optical Fiber Analysis System you can have both. Any 2800 configuration, even single parameter configurations, can be upgraded at any time to add any missing 2800 test capability. You can acquire the test capability you need, only when you need it.

Factory-Proven Reliability

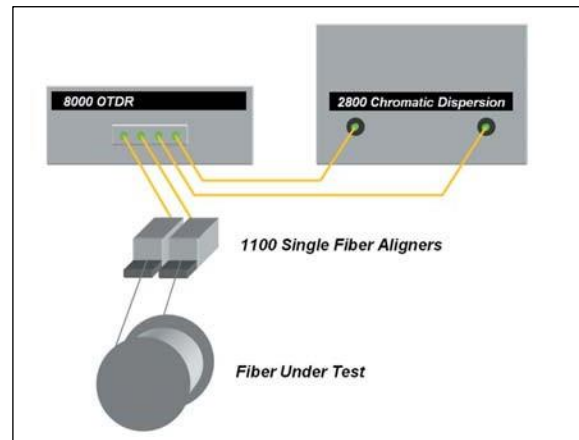
A measurement workstation can only be productive if it is up and running virtually 24/7. And this is only possible if the test equipment at the station has been designed and manufactured to achieve the highest possible reliability in the manufacturing environment. The 2800 was designed with this objective in mind and this has been proven by reliable operation in fiber and cable production for over 20 years.

Calibration of the 2800 is fully automatic. Just connect a suitable chromatic dispersion calibration artifact (available as an option with the 2800) and the calibration function will verify system calibration to maintain maximum measurement accuracy.

Ultra-high Performance Options

Options are available for the 2800 to increase measurement performance and the output of the test station. For example, the Extended Range Option utilizes ultra-high performance optical components to increase the typical 2800 chromatic dispersion measurement range to over 125 km in the 1300 nm window.

If your 2800 is to be used at a test station that includes an 8000 OTDR, the 80008 Chromatic Dispersion Pass-Through Switch Option for the 8000 may be of interest. The option provides OTDR and CD optical switching without impacting OTDR measurement range. The external optical switches used in most OTDR/CD test setups decrease OTDR dynamic range by 0.75 dB or more, doubling OTDR measurement time. But with the 8000's unique optical design, the 80008 option is able to provide this productivity-enhancing optical switching capability with no loss and no increase in OTDR measurement time.



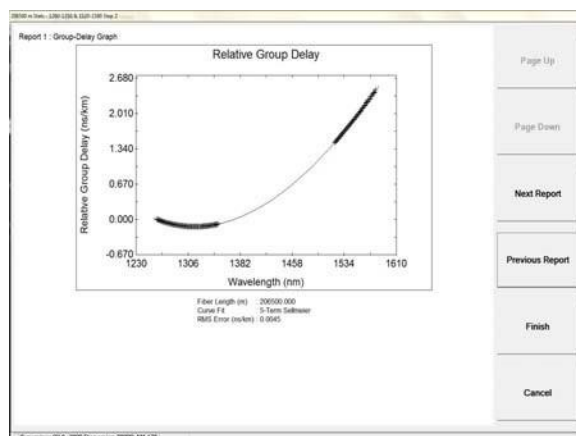
CD/OTDR test station enabled by 80008 option for the 8000 OTDR

Chromatic Dispersion and Fiber Length Specifications

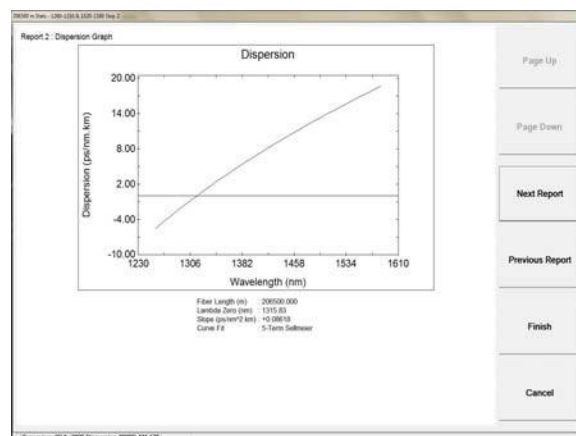
Measurements and Applicable Standards	
Chromatic Dispersion	ITU-T G.650.1, IEC 60793-1-42, TIA FOTP-175
Length	TIA FOTP-133, IEC 60793-1-22
Source Characteristics	
Wavelength Range ¹ 1310 nm LED 1550 nm LED	1240-1360 nm 1440-1630 nm
Spectral Width	< 5 nm FWHM
Wavelength Increment	User-selectable
Measurement Speed	4 wavelengths per second, user-selectable
Measurement Specifications	
Chromatic Dispersion Repeatability ² Zero Dispersion Wavelength Slope at Lambda Zero Chromatic Dispersion	< 0.005 nm < 0.05% < 0.0006 ps/nm.km
Chromatic Dispersion Accuracy ³ Zero Dispersion Wavelength Slope at Lambda Zero Chromatic Dispersion ⁴	< 0.2 nm < 1.5% ± 0.05 ps/nm.km or $\pm 1\%$ of the measured value, whichever is greater
Chromatic Dispersion Dynamic Range ⁵	> 60 dB
Length Repeatability ²	< 250 μ m
Length Accuracy	± 5 mm $\pm$ (fiber length (m) * (6×10^{-6} + group index uncertainty))
General ⁶	
Operating Temperature	15 to 30 °C
Relative Humidity	< 80%
Physical Dimensions	47.1 cm x 58.2 cm x 30.5 cm (18.5" x 22.9" x 12.0")
Weight	33 kg (72.6 lbs)
Power Requirements	100, 120, 220 (+10%, -15%), 230 (+15%, -10%) VAC, @ 50/60 Hz, 250 W
Optical Interface	FC/PC bulkhead connectors

Notes:

1. Standard wavelength range. Other wavelengths (e.g. 980 and 1060 nm) or wavelength ranges are available upon request.
2. Typical system repeatability (1-sigma) with data acquired using standard LED sources at fastest measurement speed. Based on 20 measurements of a 50 km length of standard single-mode fiber with a loss of 0.35 dB/km @ 1310 nm.
3. Accuracy limited by currently available CD calibration artifacts, not by instrument capability.
4. Accuracy of group delay measurement.
5. SNR=1, at LED peak intensity. Contact factory for higher power source availability.
6. Excluding controller.



Relative group delay of a 206 km standard un-shifted single-mode fiber.
(Extended Range Option)



Chromatic dispersion of a 206 km standard un-shifted single-mode fiber.
(Extended Range Option)

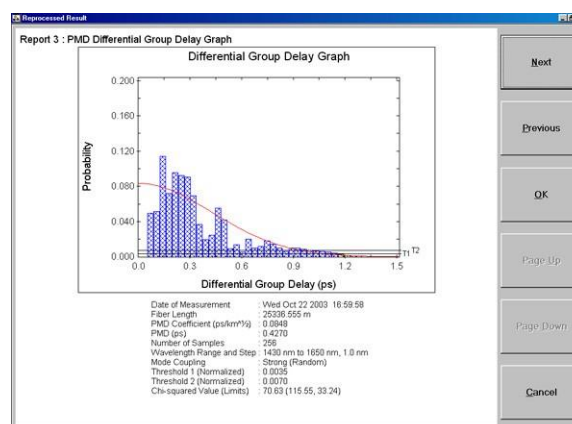
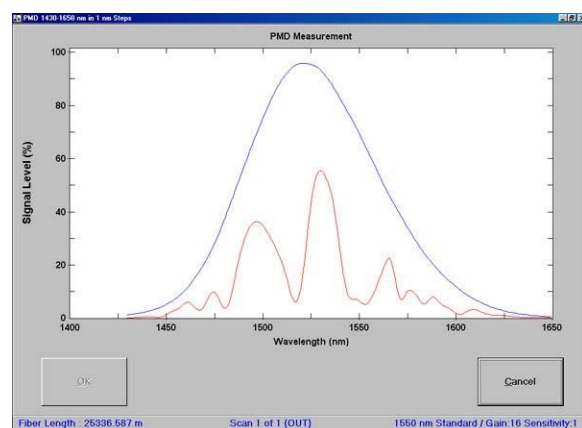
Polarization Mode Dispersion Option

Measurements and Applicable Standards	
Polarization Mode Dispersion	ITU-T G.650.1, IEC 60793-1-48, TIA FOTP-113 Fixed Analyzer Method
Source Characteristics	
Wavelength Range ¹	1200-1650 nm
Spectral Width	< 5 nm FWHM
Wavelength Increment	User-selectable
Measurement Speed	4 wavelengths per second, user-selectable
Measurement Specifications	
Minimum Measurable PMD ²	0.008 ps
PMD Repeatability ³	< 0.0008 ps

Notes:

1. Standard wavelength range. Other ranges available upon request.
2. Lower minimum measurable PMD available. Contact factory for details.
3. Measuring a PM fiber artifact (weakly mode-coupled device). Typical repeatability (1-sigma) of 5 repeat measurements (fiber not moved).

The standard PMD system/option is capable of measuring over 50 km of standard telecom-grade single-mode fiber. Longer length measurement capability is available. Contact the factory for details.



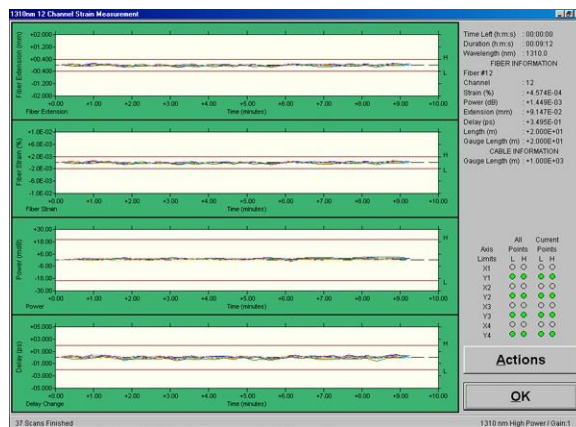
FFT analysis of the power plot data with fitted PMD result.

Strain and Power Option

Measurements and Applicable Standards	
Fiber Strain	ITU-T L.14, IEC 60793-1-22, TIA FOTP-38
Source Characteristics	
Wavelength Range ¹	1240-1360 nm 1440-1630 nm
Spectral Width	< 5 nm FWHM
Wavelength Increment	User-selectable; 0.5 nm minimum
External Input Voltage	
Range	+/- 10 VDC
Resistance	10 k ohms
Resolution	< 0.0005 V
Single Channel Option ^{2,3,4}	
Incremental Measurement Repeatability	
Length	< 20 μ m
Power	< 0.003 dB
Multiplexed Option ^{2,4,5,6}	
Incremental Measurement Drift	
Length	< 500 μ m
Power	< 0.01 dB

Notes:

1. Standard for 2800-C-OC strain and power option. Other wavelength ranges available upon request. 2800-S "strain and power only" systems utilize filtered LEDs in the 1310, 1490, 1550 and/or 1625 nm windows. Contact factory for wavelength range and spectral width.
2. Based on a measurement of a 100 m single-mode fiber sample, fusion spliced to the instrument pigtails and tested at 27 $\pm$ 0.1 $^{\circ}$ C.
3. All repeatability specifications are one standard deviation of 5 repeat measurements.
4. For optimum performance, fibers under test should be fusion spliced to the instrument pigtails. Or, in the case of connectorized fibers, they should be connected directly to the instrument bulkhead connectors.
5. Requires external fiber switch.
6. Maximum deviation from initial value over a one hour period, with normalization via a reference channel.



Multi-channel strain and power measurement results screen

Bending Loss Option

Measurements and Applicable Standards	
Macrobanding	IEC 60793-1-47
Microbanding	IEC 62221
Change in Optical Transmittance	IEC 60793-1-46, TIA FOTP-20
Source Characteristics	
Wavelength Range ¹	1200-1650 nm
Spectral Width	< 5 nm FWHM
Wavelength Increment	User-selectable in 1 nm steps; 0.5 nm minimum
Measurement Speed	User-selectable from 0.25 to 1.0 sec per wavelength
Measurement Specifications	
Dynamic Range ²	> 60 dB
Repeatability	< 0.006 dB (<0.003 dB typical)

Notes:

1. Depends on LEDs fitted.
2. SNR=1, at LED peak.

Cable Skew Option

Measurements and Applicable Standards	
Fiber Skew	Phase shift technique
Source Characteristics ¹	
Wavelength Range 1310 nm LED 1550 nm LED	1240-1360 nm 1440-1630 nm
Launch Conditions	Standard single-mode fiber
Measurement Specifications	
Repeatability ²	< 0.5 ps

Notes:

1. Standard. Other wavelengths and launch conditions available upon request.
2. Typical. Single-mode fiber.



Optical skew measurement results screen



Photon Kinetics includes products formerly branded as York Technology, PK Technology, GN Nettest and NetTest.

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