

# FTB-5700 Single-Ended Dispersion Analyzer

AUTOMATED CD AND PMD MEASUREMENTS  
IN ONE EASY-TO-USE MODULE



 EXFO Connect  
Compatible



Feature(s) of this product is/are protected by one or more of US patents 6,612,750 and 8,373,852, and US patent 7,957,436 and equivalent patents pending in other countries.

The ultimate CD/PMD characterization solution.

Standards  
Compliant

CD: EIA/TIA FOTP-175B  
PMD: EIA/TIA FOTP-243

## KEY FEATURES

Polarization mode dispersion (PMD) and chromatic dispersion (CD) measurements for all types of networks

Standards-compliant approach delivering first-time-right results

Fully automated, highly intelligent interface

One test solution for all dispersion testing—for reduced CAPEX

Single-ended testing of multiple links from one location—for fewer truck rolls and reduced OPEX

EXFO Connect-compatible: automated asset management; data goes through the cloud and into a dynamic database

## APPLICATIONS

Accurate, complete 10 Gbit/s, 40 Gbit/s and 100 Gbit/s qualification

Metro, core and long-haul network testing

Effective fiber-type identification using lambda zero, CD slope and coefficient in Raman deployments

## PLATFORM COMPATIBILITY



Platform  
FTB-500



Compact Platform  
FTB-200



# 🔗 New Market Reality Requires a New CD and PMD Testing Approach 🔗

The high-speed networking market has been trying to reconcile two conflicting objectives: deliver the faster data rates—10G, 40G and 100G—demanded by subscribers, and keep OPEX down to maintain profitability. Most network operators are well on their way to achieving the first objective, thanks to new fiber deployments and new technology advances such as coherent detection, DPSK/DQPSK and ROADM-based mesh networks. However, the additional field work—installation, activation as well as the greater dispersion granularity now required—can push operation expenses in the wrong direction. These new requirements force operators to retain the services of more field crews, potentially reducing the average expertise level of technicians and increasing the rate of repeat jobs.

In a nutshell, network operators are having to absorb more CAPEX to equip their additional technicians, and even more importantly, they are also having to absorb more truck rolls and OPEX.

The good news is the aforementioned technology advances are making next-generation high-speed networks increasingly tolerant to dispersion, shifting the focus of the test instrument toward built-in intelligence, simpler setups and automated test sequences that generate results that are immediately accurate. EXFO's FTB-5700 was designed to deliver exactly that, adding an exclusive, game-changing feature—single-endedness, which in itself dramatically cuts truck rolls.

## CD AND PMD TESTING COMBO—THE BENEFITS

Single lightweight unit that:

- › Enables single-ended testing, a market-exclusive feature
- › Allows one technician to test both CD and PMD
- › Fully automated, highly intelligent interface—no training required
- › Minimizes manual intervention for fail-safe results
- › Reduces required connections to just one
- › Leads to faster time to revenue



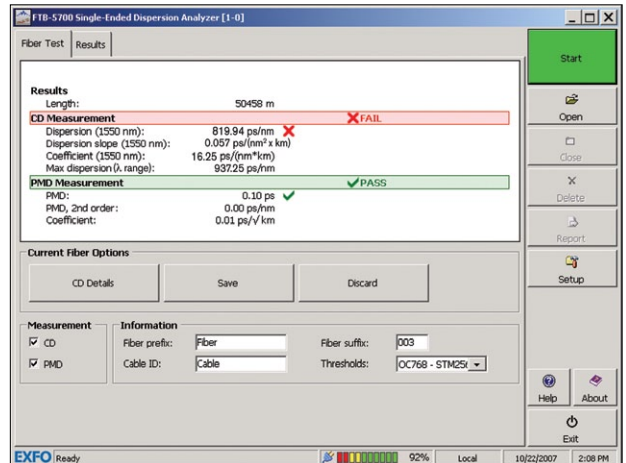
## THE ONLY SINGLE-ENDED PMD AND CD ANALYZER ON THE MARKET

The ongoing race to develop high-speed transmission systems and increase available bandwidth is facing certain limitations. Thanks to reconfigurable optical add/drop multiplexers (ROADMs), carriers and service providers are able to upgrade their systems to higher transmission rates and longer routes, but chromatic dispersion measurements are becoming more and more critical. Polarization mode dispersion, which has always been a real threat to both legacy and next-generation networks, is also becoming a more important matter as high-speed services are being massively deployed. And then, there is the lingering concern about OPEX.

Combining PMD and CD into one test solution that enables technicians to characterize multiple links from a single location, the FTB-5700 is built specifically for today's high-speed network reality. Its highly intelligent interface and functionalities **ensure that test parameters are automatically optimized, whatever the link.**

### FTB-5700 KEY FEATURES

- › Groundbreaking single-ended testing technology reduces both the testing time and operational expenses (OPEX)
- › Highly robust technology for underground and aerial fiber
- › Network recognition: unit automatically adopts the proper parameter setups
- › Link-length measurement
- › Complies with ITU G.650.3 fiber testing standard and FOTP-243 and FOTP-175B standards



The FTB-5700 features a highly intuitive user interface presenting straightforward pass/fail results.



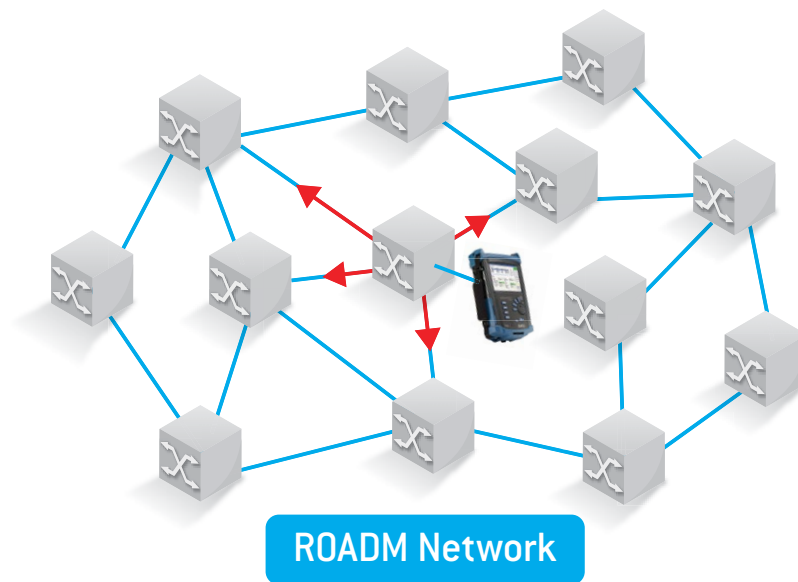
## CHROMATIC DISPERSION TESTING IN RAMAN DEPLOYMENTS

Raman is now an integral part of most coherent system deployments. To optimize Raman gain and efficiency, the fiber type of the effective area must be known. While it is known in most greenfield deployments, the same cannot be said for brownfield. When in doubt, the fiber type can be determined using the FTB-5700: lambda zero, CD slope and coefficient at 1550 nm. The FTB-5700 is uniquely positioned to take these measurements, and since it is single-ended, you will save on OPEX. Plus, the unit will calculate the fiber length for an accurate slope and coefficient measurement.

## SINGLE-ENDED TESTING: DRIVING OPEX DOWN IN A HURRY

As bandwidth demand grows, more and more links are being upgraded to speeds at which dispersion testing becomes essential. Very often, only a pair of fibers at each point of presence (PoP) require testing. In such a scenario, the time-consuming aspect has to do with the engineers' transit time from one PoP to another.

EXFO's single-ended solution speeds up the process in two ways. First, engineer A does not have to wait for engineer B to arrive at the other end of the link with the light source. And second, fibers can be tested in multiple directions, turning a job that could take hours into one that takes minutes while reducing truck rolls and OPEX.



*In a typical mesh network, unless several sections can be tested from a single node, technical crews are in for a lot of traveling.*

Typically, single-ended testing allows full network characterization in 66% less time than any other traditional test method. Here is the impact on truck rolls for the mesh network illustrated above:

Test type	Number of technicians	Total number of truck rolls
End-to-end	2	19
Single-ended	1	6
		<b>In this case, 68% less truck rolls</b>

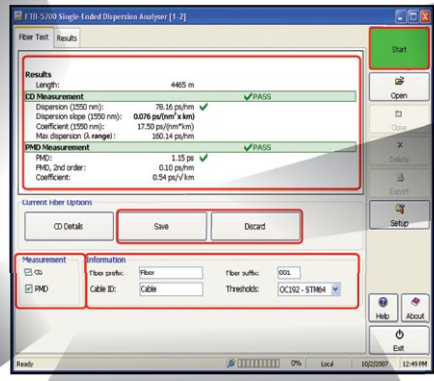
*In addition to driving down OPEX, fewer truck rolls also mean faster delivery of new services—for faster time to revenue.*

## FULLY AUTOMATED, WITH BUILT-IN INTELLIGENCE

Featuring easy-to-read pass/fail results and providing a view of all key parameters and values on one screen, the FTB-5700's user interface is all about field-testing simplicity and efficiency.

### Simple as 1-2-3

Results	
Length:	4465 m
<b>CD Measurement</b> <span style="float:right">✓PASS</span>	
Dispersion (1550 nm):	78.16 ps/nm ✓
Dispersion slope (1550 nm):	0.076 ps/(nm <sup>2</sup> x km)
Coefficient (1550 nm):	17.50 ps/(nm <sup>2</sup> km)
Max dispersion (Δ range):	160.14 ps/nm
<b>PMD Measurement</b> <span style="float:right">✓PASS</span>	
PMD:	1.15 ps ✓
PMD, 2nd order:	0.10 ps/nm
Coefficient:	0.54 ps/√km

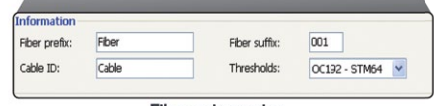


Start

2. Start all tests automatically

Save Discard

1. CD/PMD testing



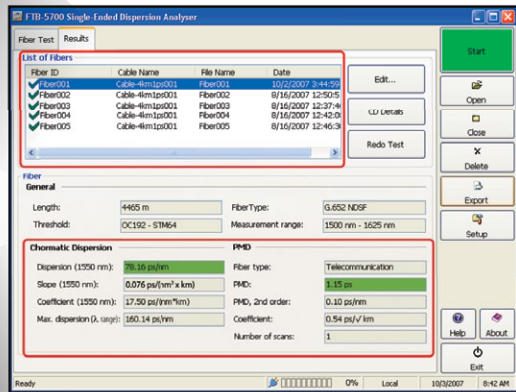
Fiber autonaming

Fiber ID	Cable Name	File Name	Date
✓Fiber001	Cable-4km1ps001	Fiber001	10/2/2007 3:44:59
✓Fiber002	Cable-4km1ps001	Fiber002	8/16/2007 12:50:55
✓Fiber003	Cable-4km1ps001	Fiber003	8/16/2007 12:37:41
✓Fiber004	Cable-4km1ps001	Fiber004	8/16/2007 12:42:01
✓Fiber005	Cable-4km1ps001	Fiber005	8/16/2007 12:46:39

3. See your results

Chromatic Dispersion		PMD	
Dispersion (1550 nm):	78.16 ps/nm	Fiber type:	Telecommunication
Slope (1550 nm):	0.076 ps/(nm <sup>2</sup> x km)	PMD:	1.15 ps
Coefficient (1550 nm):	17.50 ps/(nm <sup>2</sup> km)	PMD, 2nd order:	0.10 ps/nm
Max. dispersion (Δ range):	160.14 ps/nm	Coefficient:	0.54 ps/√km
		Number of scans:	1

View critical info on selected test



### Start with CD or PMD then Upgrade

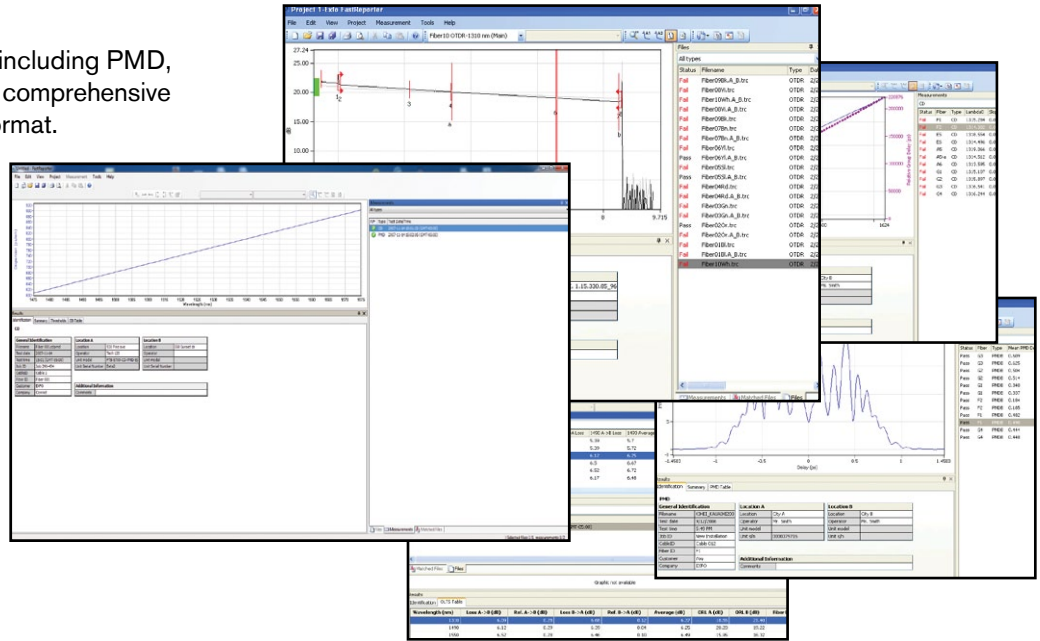
The FTB-5700 unit can be initially equipped with either the CD or PMD test features (FTB-5700-CD or FTB-5700-PMD). As your testing requirements evolve, you can then upgrade to a combined solution (FTB-5700-CD-PMD) through our service centers. This makes the purchase of this 40/100 Gbit/s-ready single-ended dispersion analyzer a truly safe and valuable investment.

## FAST-TRACK DATA POST-PROCESSING WITH FASTREPORTER SOFTWARE

The optional FastReporter software package provides you with the post-processing tools and functionalities you need to optimize your test cycles, whatever the application. Designed for offline analysis of field-acquired data, FastReporter offers a truly intuitive graphical user interface, which contributes to boosting productivity.

### Flexible Reporting

Choose from various report templates, including PMD, CD and fiber characterization. Generate comprehensive cable reports in PDF, Excel or HTML format.



## ENSURE CONNECTOR SUITABILITY WITH CONNECTORMAX SOFTWARE

Delivering fast pass/fail assessment of connector endfaces, EXFO's ConnectorMax Analysis Software is designed to save both time and money in the field. The industry's first platform-based, automated inspection application, ConnectorMax, eliminates guesswork and provides clear-cut connector endface analysis.

ConnectorMax enables field technicians to analyze defects and scratches, and measure their impact on connector performance. Results are then compared to pre-programmed IEC/IPC standards or user-defined criteria, leading to accurate pass/fail verdicts generated directly on-site.

ConnectorMax therefore helps avoid two time- and money-consuming situations: undetected connector defects that force technicians to later return to the site, and unnecessary replacement of connectors whose slight defects are not enough to get a "fail" verdict.

- › Delivers clear-cut pass/fail verdicts, eliminating guesswork in the field and saving time and money
- › Lightning-fast: results in 4 seconds through simple one-touch operation
- › Full test reports for future referencing



## EXFO Connect

EXFO | Connect

AUTOMATED ASSET MANAGEMENT. PUSH TEST DATA IN THE CLOUD. GET CONNECTED.

EXFO Connect pushes and stores test equipment and test data content automatically in the cloud, allowing you to streamline test operation from build-out to maintenance.

## EXPERT TEST TOOLS ON THE FTB-200 PLATFORM

Expert Test Tools is a series of platform-based software testing tools that enhance the value of the FTB-200 platform, providing additional testing capabilities without the need for additional modules or units.

## EXpert TEST TOOLS

**EXpert** | VoIP  
TEST TOOLS

EXpert VoIP generates a voice-over-IP call directly from the test platform to validate performance during service turn-up and troubleshooting.

- › Supports a wide range of signaling protocols, including SIP, SCCP, H.248/Megaco and H.323
- › Supports MOS and R-factor quality metrics
- › Simplifies testing with configurable pass/fail thresholds and RTP metrics

**EXpert** | IP  
TEST TOOLS

EXpert IP integrates six commonly used datacom test tools into one platform-based application to ensure that field technicians are prepared for a wide range of testing needs.

- › Rapidly performs debugging sequences with VLAN scan and LAN discovery
- › Validates end-to-end ping and traceroute
- › Verifies FTP performance and HTTP availability


**EXpert** | IPTV  
TEST TOOLS

This powerful IPTV quality assessment solution enables set-top-box emulation and passive monitoring of IPTV streams, allowing quick and easy pass/fail verification of IPTV installations.

- › Real-time video preview
- › Analyzes up to 10 video streams
- › Comprehensive QoS and QoE metrics including MOS score

TECHNICAL SPECIFICATIONS <sup>a</sup>	
Measured wavelength range (nm)	1475 to 1626
Dynamic range (dB)	25 (32 with reflector)
Distance uncertainty (km)	±(0.01 + 1 % x distance)
<b>Chromatic dispersion</b>	
Number of test points	8
CD uncertainty (ps/nm) <sup>b</sup>	±10
Test time (s)	40
<b>PMD <sup>c</sup></b>	
PMD display range (ps)	up to 50
PMD range (strong mode coupling) (ps)	0.1 to 20
PMD uncertainty (strong mode coupling) (ps) <sup>d</sup>	± (0.2 + 5 % x PMD)
Test time (s)	<180

GENERAL SPECIFICATIONS			
Temperature	operating	0 °C to 50 °C	(32 °F to 122 °F)
	storage	-40 °C to 70 °C	(-40 °F to 158 °F)
Relative humidity	0 % to 95 % non-condensing		
Size (H x W x D)	96 mm x 50 mm x 281 mm	(3 ¾ in x 2 in x 11 in)	
Weight	1.3 kg	(2.8 lb)	

LASER SAFETY	
	21 CFR 1040.10 AND IEC 60825-1:2007 CLASS 1 LASER PRODUCT

- Notes**
- a. Typical.
  - b. At 1550 nm, on 100 km of G.652 singlemode fiber.
  - c. For a fiber length ≥100 m.
  - d. For strong mode coupling PMD (telecom fiber) up to 15 ps, with averaging.

ORDERING INFORMATION	
<b>FTB-5700-XX-XX</b>	
<p><b>Model</b></p> <ul style="list-style-type: none"> <li>FTB-5700-<b>CD-PMD</b> = Single-ended CD and PMD analyzer</li> <li>FTB-5700-<b>PMD</b> = Single-ended PMD analyzer</li> <li>FTB-5700-<b>CD</b> = Single-ended CD analyzer</li> </ul>	<p><b>Connector</b></p> <ul style="list-style-type: none"> <li>EI-EUI-<b>28</b> = UPC/DIN 47256</li> <li>EI-EUI-<b>76</b> = UPC/HMS-10/AG</li> <li>EI-EUI-<b>89</b> = UPC/FC narrow key</li> <li>EI-EUI-<b>90</b> = UPC/ST</li> <li>EI-EUI-<b>91</b> = UPC/SC</li> <li>EI-EUI-<b>95</b> = UPC/E-2000</li> <li>EA-EUI-<b>28</b> = APC/DIN 47256</li> <li>EA-EUI-<b>89</b> = APC/FC narrow key</li> <li>EA-EUI-<b>91</b> = APC/SC</li> <li>EA-EUI-<b>95</b> = APC/E-2000</li> </ul>
Example: FTB-5700-CD-PMD-EI-EUI-89	

**Specialized Tests**

For ultra-long-haul, submarine and amplified network applications, EXFO also offers the FTB-5800 CD Analyzer and FTB-5500B PMD Analyzer. For these modules, the above connector choice applies, but the FLS-5834A light source is required.

Locating high-PMD fiber spans can save a significant amount of time and OPEX. Conversely, failure to do so can result in substantial costs. Building on EXFO's proven PMD measurement expertise, the FTB-5600 Distributed PMD Analyzer, which breaks down link assessment to pinpoint high-PMD sections, enables cost-effective, targeted upgrades.

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EXFO serves over 2000 customers in more than 100 countries. To find your local office contact details, please go to [www.EXFO.com/contact](http://www.EXFO.com/contact).

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