

# Singlemode OTDR Card

FCS-400



A dynamic range of up to 41.5 dB  
for long-haul requirements

OCX drivers for custom OTDR applications

Ideal for remote fiber test systems

High-performance OTDRs for system developers



Fiber-optic T&M,  
monitoring, manufacturing  
and assembly solutions

**EXFO**

# Versatility

Automation of today's repetitive procedures is increasing overall test performance and efficiency. Fiber manufacturers, telephone companies and system developers can take advantage of this improvement with EXFO's ready-to-use OTDR technology. Designed to fit perfectly into customized test applications, EXFO's FCS-400 provides advanced OTDR testing in a versatile PC card—making system testing even more flexible.



## Key Features

- Simplify manufacturing and process automation
- Configure multiple OTDR cards with other PC-based test cards
- Analyze results with comprehensive software and drivers
- Minimal dead zones for fiber or component manufacturing applications

## Performance in a PC Environment

Maximize fiber-optic testing with this advanced singlemode OTDR card. The flexible, modular FCS-400 can operate in a PC environment with off-the-shelf or customized testing software. Configure rack-mounted PCs to create sophisticated, extended test systems consisting of multiple OTDRs. EXFO provides comprehensive software and drivers to enable analysis and characterization of test results quickly and efficiently with minimal training.

Acquisitions yield up to 30 000 data points for a single OTDR trace—delivering outstanding accuracy and resolution. For example, during a three-minute acquisition, each point is averaged more than 120 000 times, resulting in a clean, precise trace.

## An OTDR You Control

Quickly program test procedures for your customized fiber-testing applications. EXFO's FCS-400 provides you with OTDR control and analysis OCX drivers. Software commands allow total control over all FCS OTDR functions, including:

- OTDR card initialization
- Information retrieval from card (acquisition settings, etc.)
- OTDR acquisition parameters (wavelength, pulse, range)
- Averaging mode acquisition
- Real-time mode acquisition
- Acquisition interruption
- Data transfer to computer

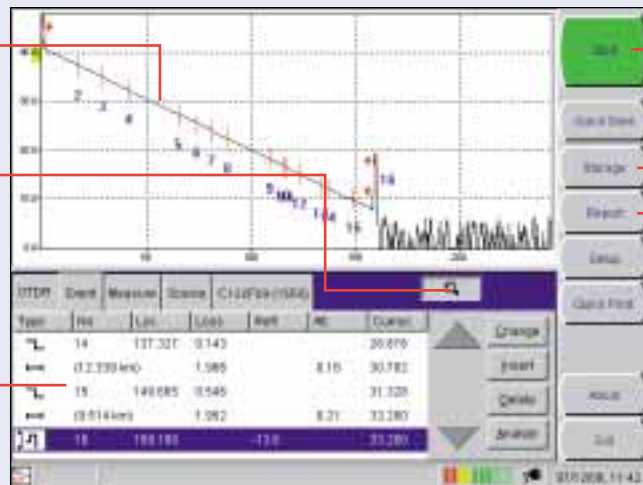
## Total Test Control with ToolBox Software

Benefit from the powerful, ready-to-use acquisition and analysis functions of EXFO's ToolBox 5 software. This user-friendly software, combined with FCS OTDR cards, is a complete turnkey solution. OTDR measurements such as two-point loss, attenuation, ORL estimation and splice loss are readily available. Other ToolBox 5 features include auto-analysis, automated dual-wavelength acquisitions, bidirectional analysis, acquisition offset, Template Trace mode, batch processing and cable report generation.

A complete OTDR trace indicates the precise location of events.

Change your view of a selected event any time with the magnification button.

A detailed event table displays event number and location, distance between events, loss in dB, reflection, attenuation, as well as cumulative loss.



Take acquisitions at one or two wavelengths automatically; they are stored in a single data file.

Automatic trace storage and trace-naming speed up repetitive testing.

Document traces and events quickly, and save time by using the report template feature.

### Auto Mode

Ideal for basic, repetitive OTDR applications, Auto mode makes OTDR measurements straightforward and is well suited to occasional users.

Simply press the Start button and Auto mode sets all test parameters, performs automatic single- or dual-wavelength OTDR testing and issues complete, detailed OTDR test results.

### Advanced Mode

Manually set all parameters with Advanced mode. Also, the ability to change the index of refraction and helix factor settings of the fiber helps to provide optimal distance measurements. To save time and enhance test results simultaneously, acquisition parameters can be fine-tuned while testing.

## Optional ToolBox Pro 5

### Batch Processor

Batch-process thousands of OTDR test results quickly and automatically.

- Save up to 90 % in data processing time
- Perform multi-operation batch-processing sessions:
  - bidirectional analysis
  - template mode
  - save and print
  - cable report
  - data format conversion

### Cable Report Generator

Avoid handling dozens of individual printouts; one simple report delivers complete information for each fiber in a cable.

- customized, Excel-compatible reports
- automatic fiber, cable and event statistics
- threshold-based, Pass/Fail test
- dual-wavelength and bidirectional cable reports

ToolBox Pro 5 is sold separately.

# Specifications<sup>1</sup>

Model	Wavelength (nm)	Dynamic range (dB) <sup>2</sup>		Event dead zone (m) <sup>3</sup>	Attenuation dead zone (m) <sup>3</sup>
		10 μs	20 μs		
FCS-402-B	1310 ± 20	40	41.5	3	10
FCS-403-B	1550 ± 20	38	39.5	3	15
FCS-403-B-ER1	1550 ± 20	40	41	3	15
FCS-423-B	1310 ± 20/1550 ± 20	40/38	41.5/39.5	3/3	10/15
FCS-404-B-ER1	1625 ± 10	36	38.5	3	20
FCS-404-B-ER2	1625 ± 10	39.5	40.5	3	20
FCS-434-B-ER1	1550 ± 20/1625 ± 10	38/36	40/38.5	3/3	15/20
FCS-434-B-ER2	1550 ± 20/1625 ± 10	40/39	41/40.5	3/3	15/20

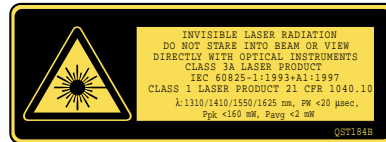
Distance range (km)	1.25, 2.5, 5, 10, 20, 40, 80, 150, 240
Pulse width (ns)	10, 30, 100, 275, 1000, 2500, 10 000, 20 000
Pulse width (m)	1, 3, 10, 27.5, 100, 250, 1000, 2000
Linearity <sup>5</sup> (dB/dB)	± 0.05
Loss threshold (dB)	0.01
Loss resolution (dB)	0.001
Sampling resolution (m)	0.08 to 10
Sampling points	Up to 30 000
Distance uncertainty <sup>4</sup>	± (1 m + 0.0025 % x distance)
Real-time refresh	< 1 second
Temperature	operating: 0 °C to 40 °C (32 °F to 104 °F) storage: -20 °C to 60 °C (-4 °F to 140 °F)
Relative humidity	0 % to 95 % maximum non-condensing
System requirements	CPU: 486 DX2-66 and higher, 8 MB RAM, compatible with Windows® 95 and 98
Power requirements	+5 VDC: 650 mA, +12 VDC: 350 mA, -12 VDC: 100 mA

## Notes

- All specifications are for a temperature of 23°C (73 °F) with FC/UPC connector, unless otherwise specified.
- Typical dynamic range with a three-minute average, at SNR = 1.
- Typical dead zone for reflectance below -45 dB, using a 10 ns pulse.
- Does not include uncertainties due to fiber index and sampling resolution.
- Does not include uncertainty due to sampling resolution.

## Laser Safety

21 CFR 1040.10 and 1040.11 CLASS 1 LASER PRODUCT  
IEC 60825-1:1993+A1:1997 CLASS 3A LASER PRODUCT



## Ordering Information

### FCS-4XX-B-XX-X-XX

#### Model

FCS-402-B = SM 1310 nm, 40 dB (9/125 μm)  
 FCS-403-B = SM 1550 nm, 38 dB (9/125 μm)  
 FCS-403-B-ER1 = SM 1550 nm, 40 dB (9/125 μm)  
 FCS-404-B-ER1 = SM 1625 nm, 37 dB (9/125 μm)  
 FCS-404-B-ER2 = SM 1625 nm, 40 dB (9/125 μm)  
 FCS-423-B = SM 1310/1550 nm, 40/38 dB (9/125 μm)  
 FCS-434-B-ER1 = SM 1550/1625 nm, 37/36 dB (9/125 μm)  
 FCS-434-B-ER2 = SM 1550/1625 nm, 40/39 dB (9/125 μm)

#### Output connector type

B = Bulkhead  
P = Pigtail

#### Connector

58 = FC/APC narrow key  
89 = FC/UPC

Example: FCS-404-B-ER1-B-58

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