



FIBER OPTIC FAULT FINDER FOR OPTICAL NETWORK SAFEGUARD™

Features and Benefits

- Low cost and compact
- Monitors and reports network health status in real time 24 hours/day, 365 days/year
- Reduces revenue loss due to damaged fiber
- Reports fault location with time stamp
- Escalates faults to tiered operational support system
- Lowers network operating and maintenance expenses
- Improves network and services availability
- User friendly interface via USB, RS-232, or Ethernet
- Cellular phone, Email, IM, SMS, text message for outages or early alert reporting

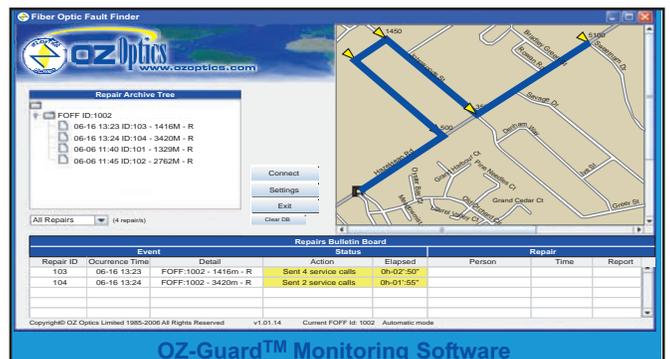
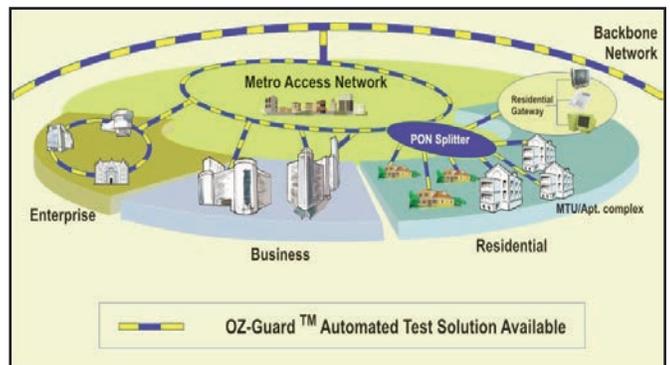
Preliminary



OZ Fault Finder

Applications

- Network fiber infrastructure health monitoring and fault reporting
- Backbone and Metro transport network monitoring
- FTTX Access Network monitoring
- MSO HFC networks
- Enterprise, private, campus fiber network monitoring
- Mission critical fiber link monitoring
- Performance monitoring subsystem for protection switch or route diversity
- Field technician test and trouble shooting tool for access or building network
- Real-time inline test and measurement
- Fiber network long term performance data collection and analysis

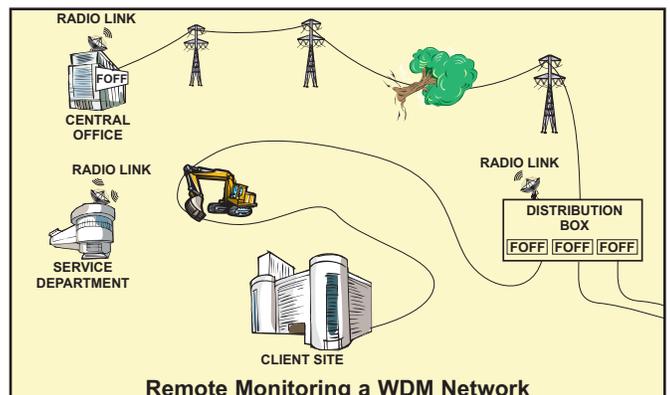


OZ-Guard™ Monitoring Software

Description

The OZ Fiber Optic Fault Finder is a cost effective, easy-to-use OTDR-type device that provides continuous monitoring of fiber optic network health. The device detects and pinpoints bad connections, fiber bends, broken fibers and other problems that can lead to reduced network performance or service failure. The Fiber Optic Fault Finder combines powerful fault detection and communications capabilities in a compact package. Remote access capability allows secure monitoring of network operating conditions using a computer from virtually anywhere.

The OZ Fiber Optic Fault Finder can be bundled with an optional software package capable of gathering raw fault location data, transforming that data into actionable information and serving it up via text message, email, instant message and the web. Escalating alarms, starting with the field engineer and rising to any level specified by the network operator, are a standard feature of the software. The software is available as a hosted web service or for integration into customer NOCs.



Please **Contact OZ** with your fiber optic network monitoring and fault detection requirements.

The OZ Fiber Optic Fault Finder enables fiber optic network operators to increase field engineer efficiency, improve network and service availability and achieve a higher overall return on investment (ROI) from fiber optic networks. Networks suitable for monitoring by the Fiber Optic Fault Finder include FTTX access networks, backbone and metro transport networks, enterprise fiber networks, and multi-service operator (MSO) networks including hybrid fiber/coax (HFC) networks.

Ordering Information For Standard Parts:

Bar Code	Part Number	Description
31780	FOFF-100-1310-9/125-S-3A-0-0-U	Fiber Optic Fault Finder operating at 1310 nm, configured for USB communication. The optical connection is a receptacle style FC/APC, with 9/125 micron fiber.
28925	FUSED-12-1300/1550-9/125-WDM-3AXX-1-1	Fused WDM coupler for combining 1300 and 1550 nm wavelengths. The 3 fibers are 1 meter long, 0.9 mm jacketed corning SMF 28 fiber. The 1300 nm port is terminated with an FC/APC connector, while the other two ports are unterminated.

Standard Product Specifications:

Optical Specifications		
Parameter	Value	Comments
Wavelength	1310 or 1550 nm	Other wavelengths are also available
Fiber type	9/125 Singlemode fiber	Other fiber types are also available
Optical connector	FC/APC	Other connector types are available
Dead Zone	10 m	To a reflective event
	40 m	To a non-reflective event
Smaller Dead Zones are also available		
Sampling resolution	2.5 m	Better resolutions are also available
Distance accuracy	5 m + (3x10 ⁻⁵ x distance)	Does not include errors from index of refraction.
Maximum measurement distance (Using a 50 ns pulse)	60 km	Reflective event
	25 km	Non-reflective event
Longer distances are also available		

Electrical Specifications		
Power requirements	12 to 15 volts	AC Adaptor provided
Operating current	500 mA (max)	
Data Interface	RS232, USB, or Ethernet	

Environmental Specifications		
Operating Temperature	0 to 40 °C	
Storage Temperature	-20 to 60 °C	
Operating Humidity	0 to 95% (non-condensing)	

Software Specifications (Optional OZ-Guard™ Software)		
Hosted Web Services	Available	
User Interface	Configurable, includes map location	
Alarm Types	Email, IM, SMS standard	
Alarm Information	Time-stamped event location standard	
Database	Standard	

Ordering Information For Custom Parts:

OZ Optics welcomes the opportunity to provide custom designed products to meet your application needs. As with most manufacturers, customized products do take additional effort so please expect some differences in the pricing compared to our standard parts list. In particular, we will need additional time to prepare a comprehensive quotation, and lead times will be longer than normal. In most cases non-recurring engineering (NRE) charges, lot charges, and a minimum order will be necessary. These points will be carefully explained in your quotation, so your decision will be as well-informed as possible. We strongly recommend buying our standard products.

Questionnaire:

1. What is the wavelength being used by the data stream?
2. How long is the fiber?
3. What type of fiber is being tested?
4. What resolution is required?
5. Do you need to detect reflections, losses, or both?
6. What type of communication interface do you need?

Description

Fiber Optic Fault Finder

Part Number

FOFF-100-W-a/b-F-X-JD-L-I

W = Operating Wavelength in nm:
1310 = 1310 nm
1550 = 1550 nm
Contact OZ Optics for other wavelengths.

a/b = Fiber core/cladding in microns:
9/125 for standard corning SMF-28 fiber.

F = Fiber Type:
S = Singlemode
P = Polarization maintaining

I = Communication Interface:
R = RS232
U = USB
E = Ethernet
Contact OZ Optics for other interfaces.

L = Fiber length in meters (0 = Receptacle style FOFF)

JD = Jacket Diameter:
1 = 1 mm OD loose tube
3 = 3 mm OD loose tube Kevlar reinforced
PVC
0 = Receptacle style FOFF

X = Connector types:
3A = Angled FC/PC
X = no connector (unterminated fiber pigtail)

Description

Fused Coupler:

Part Number

FUSED-12-W1/W2-a/b-WDM-XYZ-JD-L

W1/W2 = Wavelengths to combine (nm):
1300 = 1300 nm
1550 = 1550 nm
Contact OZ Optics for other wavelengths.

a/b = Fiber core/cladding in microns:
9/125 for standard corning SMF-128 fiber.

L = Fiber length, in meters, on each arm.

JD = Jacket Diameter:
1 = 1 mm OD loose tube
3 = 3 mm OD loose tube Kevlar reinforced PVC

XYZ = Connector types for short, long, and combined wavelength ports:
3A = Angled FC/PC
X = no connector
These parameters refer to the connectors for the shorter input wavelength, the longer input wavelength and output connector respectively.

See table 6 of the Standard Tables for other connector types.

Ordering Example For Custom Parts:

A customer is transmitting data at 1550 nm along a fiber, and needs to be able to monitor the line for breaks or losses at the same time. He would like to have a pigtail-style FOFF operating at 1310 nm, with a USB interface to a computer. The part number for the FOFF would be FOFF-100-1310-9/125-S-3A-3-1-U.

To combine the signal from the FOFF with his data fiber, he can use the following fused coupler, which he will fusion splice into his data fiber: FUSED-12-1300/1550-9/125-WDM-3AXX-1-1.

Customers who are interested in purchasing the OZ-Guard™ software should contact OZ Optics. This software will be customized, based on the needs of the installation.

Frequently Asked Questions (FAQs)

Q: How is the FOFF signal connected to a fiber carrying data?

A: A WDM (Wavelength Division Multiplexer) can be used to combine the data signal with the FOFF signal, since the two signals operate at different wavelengths. Any reflected FOFF signals will be returned to the FOFF, through the same multiplexer. A filter, just before the 2nd transceiver, separates the data from the combined signal stream.

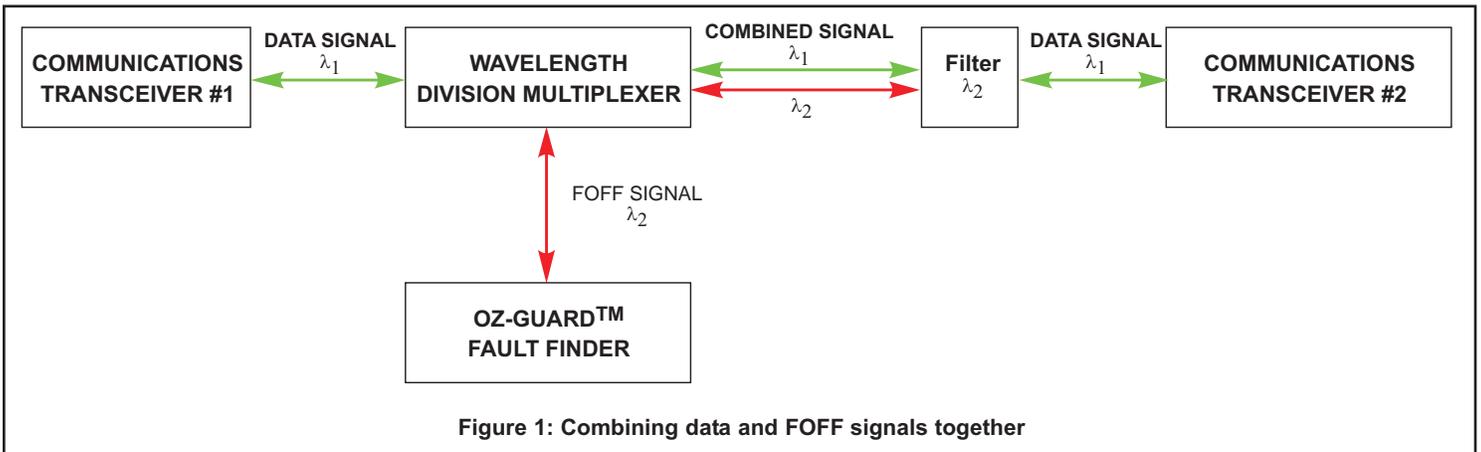


Figure 1: Combining data and FOFF signals together

Q: What will happen if the FOFF and data are both operating at the same wavelength?

A: The data stream will interfere with the measurements, and the measurement signal may corrupt the data. The FOFF must have a different wavelength from the data for the system to work properly.

Q: Can the FOFF detect more than one event?

A: Yes. It can detect and report the position of multiple events, as well as identify the type of event (attenuation event or reflective event).

Q: I know that I have one fault in my fiber, but the FOFF is reporting several events. Why?

A: The signal may be bouncing back and forth between the real fault and the fused splitter. Each time this happens, part of the signal reaches the FOFF and is reported as an event, while another part of the signal bounces back towards the fault, where it will be reflected again and appear to be another fault. Events like this are easy to identify, since they appear at regularly spaced intervals.

Q: Can the FOFF detect faults that are located after a splitter?

A: The FOFF is intended as a tool to find faults within a single fiber path, such as a continuous fiber, or fibers connected in series. If a problem is detected beyond a splitter, it will not be possible for the FOFF to determine which optical path has the fault, as the test results will be ambiguous. If a signal is split, there should be a FOFF monitoring the fibers connected to each leg of the splitter to ensure complete monitoring coverage. Similarly, the FOFF cannot be used to monitor a signal path beyond a filter or WDM that might block the FOFF signal.

