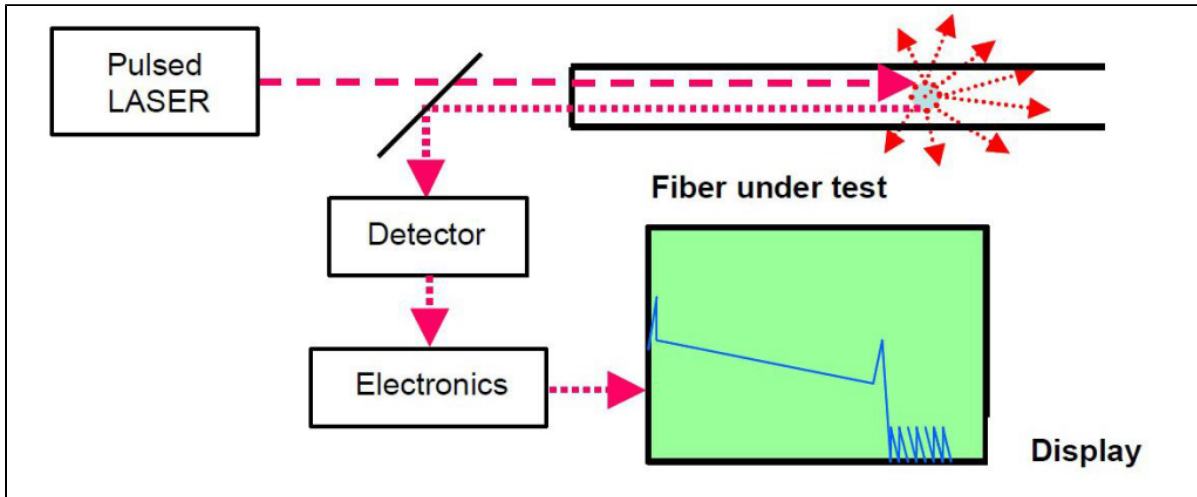# Optical: Optical Time-Domain Reflectometer (OTDR)

Summary

- Basic summary - a tool used to measure distance, loss, reflection, and other important variables on a strand of fiber. It uses pulses of laser light and detects the reflections to determine distance to events.
    - Wikipedia Link

Basics

- An OTDR test cannot be performed on a strand of fiber with light on it (a transceiver transmitting on the other end of the fiber being tested).

Conducting an OTDR test

- Contracting out OTDR testing is common and local splicers and/or fiber installers can be contacted to perform a test (for a fee)
- Purchasing your own
    - Brands such as Viavi, Fluke, AFL, and others can provide quotes or sometimes rentals
    - There are also some lower cost testers with far less detail that might work in some situations such as FlexOptix's S.OB1612.40.OD

OTDR Results Display

The OTDR will likely have an on-screen display to show you results. You should also have the option to save the results to a file for later review.

Here is an example of a WiscNet metro backbone link validated for 1550nm (with job details scrubbed):

VIAVI

Cable Id :	Fiber Id :
Location A :	Location B :
Job Id :	Technician Id :

| SmartOTDR (S/N 41120) | E126B (S/N 41120) | Date : 08/29/2020 05:36 |

Test Setup							
OTDR SMART	1550nm	30ns	10km	64cm	5.0s	1.46800(G652 G657)	-81.0 dB

Alarms

Thresholds	USER				
Connector Loss (dB)	>0.75	Splice Loss (dB)	>0.30	Reflectance (dB)	>-35
ORL (dB)	<32				

Summary

Filename	Laser nm	Link Loss dB	Link Orl dB	Fiber End m	Direction	Avg Loss	Event	Alarms
	1550	1.242	36.20	3768.47		0.330	7	✔

| -20.42 | -0.00 | 1982.83 | 1989.21 | 3744.85 | 3760.17 | 3768.47 m |

OTDR 1550nm
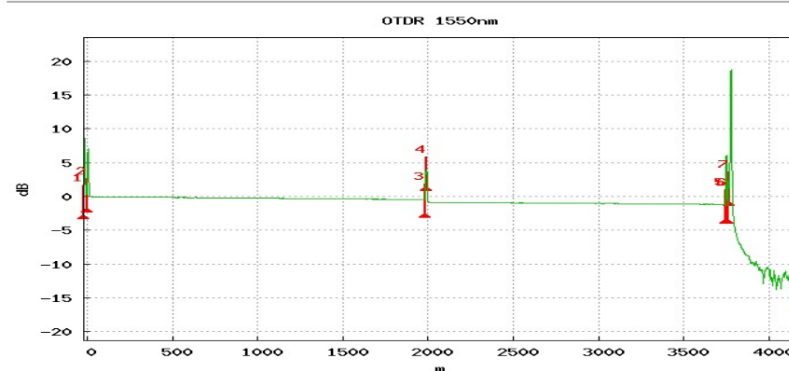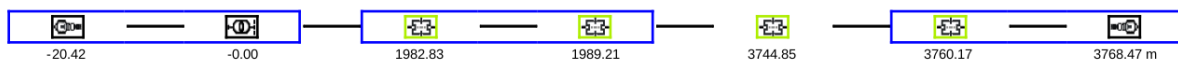
Event		Distance	Loss	Reflect.	Section Att.	Section	T. Loss
		m	dB	dB	dB	m	dB
1		-20.42	0.047	-47.71	0.000	0.00	0.000
2		0.00	0.000	-50.83		20.42	
3		1982.83	0.000	-56.78	0.390	1982.83	0.394
4		1989.21	0.404	-56.44	0.000	6.38	0.394
5		3744.85	0.088	-50.49	0.354	1755.64	1.152
6		3760.17	0.001	-56.64	0.000	15.32	1.241
7		3768.47		-24.75	0.000	8.30	1.242

More information

OTDRs: Finding the Weak Spots in Fiber Links

The FOA Quick Start Guide to OTDR

The FOA Reference: Fiber Optic Testing