

OTDR Testing Deep Dive Workshop

Intermediate

This two-day instructor-led course focuses on field testing and troubleshooting fiber optic spans/links and explains the various types of equipment and tools needed for acceptance testing, documenting performance, and finding problems in a fiber physical plant. The emphasis is on understanding proper OTDR settings, overall testing, and evaluating results.

Audience: Installers, OSP technicians, maintenance techs, field supervisors, or senior technicians

Prerequisite: Any Light Brigade foundational level course such as Fiber Optics 1-2-3, Broadband Fiber Optic Technician Level 1, Fiber Optics for Utilities Level 1, or equivalent field experience



Credentialing



Light Brigade Digital Badge

Complete this course and receive a Credly digital badge.



Continuing Education Credits (CECs)

12 BICSI CECs



Click or scan for
detailed course information
and upcoming training locations.

Did you know – OTDR Testing Deep Dive and Emergency Restoration are often offered back-to-back in the same week?

“This course was very helpful in learning about the OTDR test equipment. Recommend to anyone using this equipment.”

–Tom McLaughlin, Anoka County Highway Department

OTDR Testing Deep Dive

Detailed Course Outline

In this two-day course, students will learn best practices associated with the preparation and testing of installed fiber links. Students will develop expertise using optical time-domain reflectometers (OTDRs) and gain understanding of proper cleaning, inspection, and troubleshooting techniques and tools.

This course will have a maximum ratio of six students per instructor. Although the class is fully equipped, students are encouraged to bring their own test equipment to class as well.

Prerequisites: Any Light Brigade foundational level course such as Fiber Optics 1-2-3, Broadband Fiber Optic Technician Level 1, Fiber Optics for Utilities Level 1, or equivalent field experience.

Certifications and Credits: BICSI Continuing Education Credits
Light Brigade Digital Credentialing

Course Content

Light and Fiber Basics

- Basic signal communication
- Digital communications
- The binary system
- The electromagnetic spectrum
- What is an optical fiber?
- Multimode fiber
- Single-mode fiber
- Fiber comparison
- Total internal reflection
- What is a mode?
- Lightwave transmission
- The dBm and dB scales
- Typical power levels
- Intrinsic and extrinsic attenuation
- ITU-T G.657 bend-insensitive fibers
- Fresnel reflection
- Advanced single-mode impairments
- Typical fiber specifications
- Subscriber connectors
- LC connectors
- Connector color identifiers
- Fiber profile versus reflection
- Optical connector performance
- ORL/reflectance performance guidelines

Connector Endface Cleaning and Inspection

- Connector inspection criteria
- Dust dimensions
- Reflection issues
- Fiber optic connector polishes
- Connector cleaning kits

Instructor Demonstration

- Connector endface inspection and cleaning

Basic Fiber Test Tools

- Connector endface inspection tools
- Optical power meters
- Optical light sources
- Optical loss test sets
- Certification test sets
- Fiber identifiers
- Optical talk sets
- Visual fault locators
- Visual tracers

Power, Loss Budgets, and Testing Basics

- Optical power and link loss budgets
- Testing link loss
- One, two, and three-jumper methods for spans
- ORL versus reflectance
- OTDRs versus dedicated testers



OTDR Introduction

- How an OTDR works
- OTDR traces
- Trace versus schematic displays
- Icon-based reporting
- Choosing the proper OTDR
- Dynamic range
- OTDR dead zones

OTDR Configurations and Uses

- Compact or handheld OTDRs
- OTDR modules
- Fiber monitoring systems
- Portable OTDRs
- Reel acceptance testing
- Checking splices
- Fiber link characterization
- Proactive maintenance
- Fault location
- Emergency restoration
- Specialty OTDRs
- System OTDRs for monitoring
- Key issues for OTDRs

Key Setup Parameters

- Auto versus manual operation
- Schematic display/test options
- Wavelength
- Display range
- Pulse width
- Real time
- Averaging
- Index of refraction
- Backscatter coefficient

Instructor Demonstration

- OTDR launch levels

OTDR Challenges

- Launch levels
- Ghosts (echoes)
- Managing OTDR dead zones
- Attenuation vs. event dead zone
- Resolution – pulse width selection
- Launch and receive fibers
- Gainers

Proper OTDR Setup

- Pre-testing setup
- Date, time, and file directories
- Establish good connectivity
- Optimizing test settings
- Matching settings
- Validation and testing
- Backing up test results

OTDR Trace Analysis

- Event signatures
- Fiber tolerances
- Fiber mismatches and gainers
- Micro- and macrobending
- Link ORL and reflectance data
- Proper manual cursor settings
- Connector pass/fail
- Event tables
- OTDR loss summary acceptance reports

Hands-on: Trace Analysis

- Analysis and discussion of multiple OTDR traces

Hands-on: OTDR Lab Exercises

- Test a fiber route through all steps:
 - Admin/file setup
 - File naming
 - OTDR settings
 - Preliminary shots
 - Testing
 - Saving results
 - Recording and analyzing results
- Teams to rotate through various setups
 - Front haul antenna scenario
 - FTTx feeder/distribution scenario
 - Metro or data center scenario
- Complete simulations and report findings to group

Post-test Analysis

- Trace post-processing software
- Viavi FiberCable 2
- EXFO FastReporter 3

Instructor Demonstration

- FiberCable software

Wrap-up and Review