Hands-On

Fiber Characterization and Advanced Fiber Optic Testing

Course Description

This Hands-On Advanced Fiber Optic course will give technicians in-depth knowledge of testing and troubleshooting procedures in the long haul and Metro optical networks.

Attendees will gain a detailed understanding of the ITU G.650.3 Fiber Characterization standard and the requirements for Fiber Characterization in todays networks. This course provides an understanding of important aspects of fiber optics and focuses on the equipment used to test and troubleshoot fiber systems.

This course involves advanced fiber optic theory and is intended for engineers and technicians involved with equipment or outside plant where fiber characterization is required. Specifically, networks running >10Gbp/s, DWDM and OTN.

Our instructors have actual field experience and have faced the same obstacles as your team. Our Real World Experience allows us to provide the participants with the answers and the skills to overcome their daily challenges.

Students Will Learn

- **Fiber Review of Fiber Optics And Light Transmission**
- **Overview of Basic Fiber Optic Testing Practices**
- **The Proper Set-Up, use, and Interpretation of Results Using an OTDR (Optical Time Domain Reflectometer) On a Fiber Circuit.**
- **Over-All Length of Fiber Circuit Under Test. Length Of Each Segment Of Fiber In-Circuit.**
- **Acceptable vs. Unacceptable Splice /Connector Loss**
- **dB Loss in Each Segment of Fiber in Circuit.**
- **Understanding Loss vs. Power Budgets.**
- **Effects of Micro Bending On Waveform.**
- **Broken Fiber in Circuit.**
- **Wavelength of Laser Setting.**
- **Understanding OTDR Laser Pulse Widths.**
- **Index of Refraction and How it Affects Fiber Testing.**
- **Distance Scale Setting.**
- **Review of Decibel Ratios and dB Scale Setting.**
- **Chromatic and Polarization Mode Dispersion**
- **Reflectance and the Contributions to Optical Return Loss (ORL)**
- **And More...**

Target Audience

Technicians, installers, splicers, contractors, telecom managers, engineers, and anyone involved in repairing, installing, maintaining, designing, evaluating, or provisioning active and passive WDM, DWDM and OTN systems.

Prerequisites

A firm understanding of telecommunications and basic fiber optic splicing, termination, and testing are required prior to taking this course. This training is available in additional BTS courses.

Course Outline

Module I: Fiber Optic Systems

Advanced Fiber Optic Systems
Active network design features
WDM technology and how its used in FTTH

Module II: Testing and Troubleshooting Fiber Systems

Understanding attenuation
Causes of attenuation
Testing attenuation at different wavelengths
Understanding back reflection
Understanding optical return loss (ORL)
APC (Angled Physical contact) connector versus UPC connectors
Dispersion characteristics and pulse spreading issues
Loss budgets and power requirements, Engineered vs. Actual Measured Loss (EML/AML)
Testing CD and PMD (Equipment for hands-on should be provided by the customer so technicians will learn on equipment that will be used in the field)

Module III: G.650.3 Fiber Characterization

Understand the G.650.3 Standard
Required test equipment
Setup of the OTDR

Analyzing OTDR traces
CD and PMD Testing
2-point and 4-point measurements
Testing at different wavelengths
Attenuation Profile (AP)
Measure fiber length, loss and back reflection
Measure to events and how to add template events
Setup of the power meter and light source
Interpreting PM and light source results
Using visible light sources (VFL)

Delivery Method

Instructor led with numerous Hands-On labs and exercises.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

3 Days