

Certified Fibre Optic Specialist - Testing

COURSE DESCRIPTION:

This training program is designed to introduce the student to the process of fibre optic network testing. It is intended for those looking to acquire the FOA CFOS-T Fibre Optic Network Testing Specialist Certification, either as a contractor, installer or end user.

WHO SHOULD ATTEND:

Technicians, installation and maintenance engineers and anyone operating in a fibre testing environment.

PREREQUISITES

It is assumed that the student has a solid knowledge of fibre optics (i.e. FOA Certified Fibre Optic Technician).

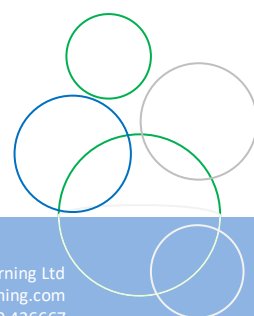
COURSE OBJECTIVES:

- What is involved in testing a fibre optic network
- Using power and loss budgets to ensure the communications systems will work over the fibre optic proposed cable plant
- How to determine what should be tested and documented
- What paperwork and documentation will be needed for the project
- How to create a test plan

FORMAT:

3-day, interactive classroom based course based on the FOA Guide to Fiber Optic Testing, with quizzes and hands on exercises.

Maximum attendees 12 per course



CONTENT:

Introduction

- What Is Fibre Optic Testing?
- Who Does Fibre Optic Testing?
- Knowledge Required To Test Fibre Optic Networks
- Why Use Fibre Optics?

Overview of Fibre Optic Testing

- Testing Comms Networks
- Industry Standards
- Measurement accuracy

Fibre Optic Jargon

- Cables
- Installations
- Terminations & Splicing
- Performance Specs
- Tools & Test Equipment

Standards For Testing

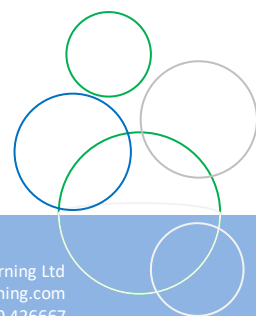
- FOA Standards
- International Standards

Test instruments

- Inspection Microscopes
- Connector cleaning kits
- Visual Fibre Tracers and Visual Fault Locators
- Optical Power Meters
- Optical Light Sources
- Optical Loss Test Sets
- Reference cables & mating adapters
- OTDR's
- Fibre Identifiers
- Dispersion measurement equipment
- Electrical to Optical Converters
- OCWR's
- Fibre Analysers
- Remote Test Systems
- Talk Sets
- Optical Attenuators

Visual Inspection and Cleaning

- Inspection with Microscopes
- Fields Inspection
- Connector Cleaning
- Protecting & Cleaning Equipment & Cables



Loss Budgets

- Understanding Power and Loss budgets
- Power Budget Calculation
- Mixing Fibres
- Comparing Measured to Actual Results

Optical Power

- Power Meters
- Power Measurement
- Understanding dB's
- Calibration & Measurement Uncertainty
- Relative Measurement Errors

Insertion Loss

- Definition
- Insertion Loss Testing
- Cutback Testing
- Cable & Plant Testing
- Patchcord Testing
- Standards for IL Testing
- Choosing Test Equipment
- Double Ended Testing
- Interpreting Optical Loss Data
- Troubleshooting Hints

OTDR Testing

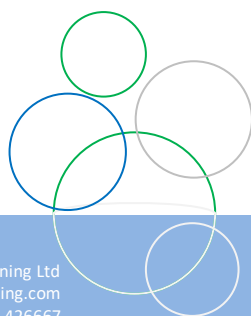
- What is an OTDR
- Information on an OTDR Trace
- Making Measurements
- Setup Parameters for Best Results
- Measurement Uncertainty
- Documentation & Records

Fibre Characterization

- Spectral Attenuation
- Chromatic Dispersion
- Polarisation Mode Dispersion

Reflectance Testing

- Reflectance and Optical Return Loss
- Measuring Reflectance



Passive Optical Network (PON) Testing

- PON's Explained
- PON Cable Plant Testing
- Insertion Loss Testing of a PON
- OTDR Testing of a PON
- FTTx Testing Issues

Testing And Troubleshooting Checklists

- Steps for Installed Cable Plants

Fibre Optic Testing Metrology - Measurement Errors

- The Science of Measurements
- Insertion Loss Measurement of Multimode Fibre
- OTDR Measurements

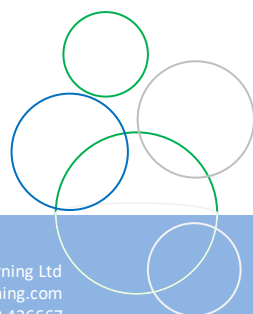
Hands-on Labs

Cleaning And Visual Inspection

Students will learn how to use fibre optic microscopes to inspect connectors for damage, dust and contamination. Students will use various methods to clean the connectors, wet, dry and wet/dry, and evaluate the effectiveness of each cleaning method.

Fibre Tracing And Visual Fault Location

Students will learn how visual tracers are used to check fibre optic system polarity and how to use visual fault locators to find breaks, bending losses and bad connectors and splices.



Insertion Loss Testing

Students will learn how to use a test source and power meter or OLTS to make insertion loss tests of fibre optic cables. They will learn how to choose and verify the condition of reference test cables by visual inspection and insertion loss testing. The lab will show the difference in single-ended testing and double ended testing, the effect of reference test methods on measurements and how mode conditioning affects multimode fibre measurements. Tests should be made on a simulated cable plant that has faults included for training in troubleshooting.

- Visual inspection of reference cables, clean and verify cleaning
- Test reference cables against each other using single-ended test, record data
- Test simulated cable plant (see below) with double-ended test using one-cable reference. Randomly connect segments of simulated cable plant for each student.
- Test simulated cable plant in the opposite direction with double-ended test using one-cable reference and compare results to other direction.
- Repeat cable plant test with two- and three-cable reference, record and compare data.
- Repeat cable plant test without and with modal conditioning (multimode mandrel wrap, singlemode single 60mm/2.5" loop), record and compare data. Check MM modal conditioning with HOML test.

OTDR Testing

Students will learn how to operate an OTDR and interpret traces. Using a simulated cable plant, they will see how OTDR parameter setup affects the trace and how to optimize the choice of parameters. They will learn how to choose appropriate launch and receive cables. They will analyze traces using both two-point and LSA methods. Labs should use the same simulated cable plant for both OTDR and insertion loss tests to allow students to understand the differences in both types of testing.

Assessment

- Students will sit a closed book exam to gain the CFOS-T qualification

