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# Advanced OTDR testing (telecoms networks)

2 days

### Purpose

An OTDR is a powerful tool for acceptance testing and for fault diagnosis of fibre optic cabling. This course is designed specifically for those who want to build an in-depth knowledge of OTDR testing for telecoms networks.

We'll briefly review routine testing issues before looking at the basic capabilities & limitations of an OTDR. You'll learn to set up the OTDR correctly, carry out testing efficiently and effectively, using methodical file naming & checking that results are valid. You'll learn how to manage & control the complete testing process successfully from correctly interpreting test specifications, successful data acquisition, analysis & interpretation of results.

This course is suitable for test engineers responsible for the acceptance testing and fault diagnosis of fibre optic cabling within the telecoms environment. It is also suitable for managers, and technical support staff responsible for analysis of test results & production of test reports.

### Features

- small, informal groups to provide the best learning experience
- hands-on experience with the equipment
- realistic practical exercises using specially constructed test rigs
- comprehensive course manual for reference
- access to supporting online resources

### Key outcomes

Be able to:

- ✓ carry out inspection of fibre optic connectors and adaptors with a video probe
- ✓ carry out continuity and insertion loss testing
- ✓ explain why you are carrying out OTDR testing on fibre optic cabling
- ✓ interpret and evaluate test specifications
- ✓ optimise OTDR test parameters and measurement conditions to enhance the acquisition of the required information
- ✓ speed up data acquisition using automatic routines & other features of your OTDR
- ✓ interpret and analyse OTDR traces, event tables and icon based link maps
- ✓ recognise and deal with any problems/issues you might encounter when using an OTDR
- ✓ explain the parameters that you are testing and recognise the range of results that you might expect
- ✓ make an assessment of the quality of the fibre infrastructure

### Pre-requisites

The course assumes a basic knowledge of fibre optic technology, & the terminology used in telecoms networks. It also assumes some previous knowledge of fibre testing.

If you are new to fibre or fibre testing then you might like to consider the three day OTDR-TT course instead, or attend a COFI course first.





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## ROUTINE TESTING BRIEF REVIEW

### INSPECT+CLEAN CONNECTORS

- Why do we inspect & clean?
- Inspection standards
- Inspection equipment
- Cleaning equipment
- Connector care
- ✓ Hands-on practical: cleaning and inspecting connectors

### CONTINUITY & POLARITY TESTING

- Continuity & polarity checking
- ✓ Hands-on practical: continuity and polarity

### TESTING TELECOMS LINKS

- Optical power & loss budgets
- Equipment
- Insertion loss measurements
- Reporting
- ✓ Hands-on practical: ILM

## OTDR TESTING

### PREPARING FOR OTDR TESTING

- Specification of parameters
- Resources checklist
- Management of test results
- ✓ Hands-on practical session

### OTDR INTRODUCTION

- What is OTDR testing?
- What can it do for us?
- How does it work?

### OTDR CAPABILITIES

- Distance measurements
- Fibre loss measurements
- Bending losses
- Splice loss measurement
- Connector losses
- Link return loss (ORL)

### OTDR LIMITATIONS

- Dynamic range
- Dead zone
- Resolution

### TEST CONFIGURATIONS

- Cable on a drum
- Installed cable before termination
- Connectorised systems

## USING THE OTDR

- Step by step guide
- Manipulating the trace
- Measurement parameters
- ✓ Hands-on practical: setting up the OTDR and testing simple links

## OTDR ISSUES

- Poor launch conditions
- Interfacing with bare fibres
- Ghosts
- Fibre mismatches
- ✓ Hands-on practical: testing more complex links and channels

## OTDR TRACE ANALYSIS

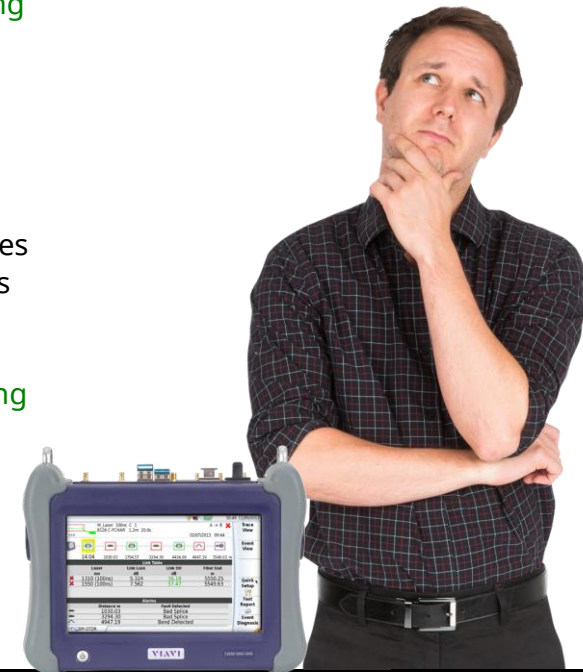
- What info do we want?
- Analysis of a single trace
- Multiple wavelength traces
- Analysis of multiple fibres
- Bi-directional analysis
- ✓ Hands-on practical: bi-directional OTDR testing
- OTDR trace comparison
- ✓ Hands-on practical: trace analysis exercises, basic and advanced

## USING OTDR SOFTWARE

- OTDR viewer software
- Automatic event detection
- Comparing OTDR traces

## PON TESTING OVERVIEW

- Designing PONs to be testable
- When and what should we test?
- PON test equipment
- PON test methods





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CommsLearning, founded by Andy Edwards in 2002, specialises in providing training in ICT and Telecommunications, to a broad range of clients around the World spanning the banking, retail, utilities, telco, military, airline, technology and media industries. Now based in the Asia Pacific region, Andy is the CEO and Head of Technical Delivery and is focussed on instructor-led technical training, delivering training in New Zealand, the Pacific Islands and Australia; a role that his 40+ years of telecommunications experience qualifies him well for. Andy also works with local partners across the Asia Pacific region who are able to help with specific requirements.

Andy is licensed by Optical Technology Training to teach the OTT CONA, CFCE, CONE and Advanced OTDR courses.

