

## Educator Kit

## ED-NET

### COMPREHENSIVE LABORATORY BASED EDUCATIONAL PACKAGE IN FIBRE OPTIC NETWORKS AND OTDR ANALYSIS



#### MAIN FEATURES AND BENEFITS:

- All fibre optic and optoelectronic hardware required to perform the experimental investigation
- Extensive literature support including: student and instructor's manuals with exercises, solutions & sample results
- Detailed lecture notes, tutorial examples and solutions to assist with the development of courses
- Saves considerable course, literature and hardware development effort

#### THE EXPERIMENTAL INVESTIGATION\* ADDRESSES:

- Fundamental properties and operation of OTDRs (dead zone, distance and spatial resolution, dynamic range etc.)
- Event identification and location
- Line, component, splice & bend loss measurements
- Network components and their characterisation at 1310nm and 1550nm
- Uni & bi-directional investigation of multi-branch and wavelength division multiplexed (WDM) networks
- Analysis of networks with deliberately introduced faults

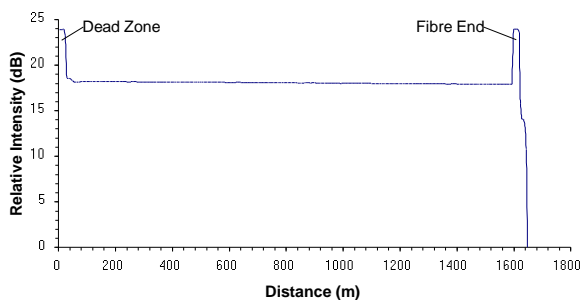
\*Full details of the experiments and equipment specifications are provided overleaf

## Laboratory Exercises

ED-NET enables students to investigate the fundamental characteristics of optical time domain reflectometry using a commercial OTDR unit and observe how these principles are applied in practice to examine the response of optical fibre links, fibre optic components and optical fibre networks. The ED-NET educator kit will allow the following experiments to be performed:

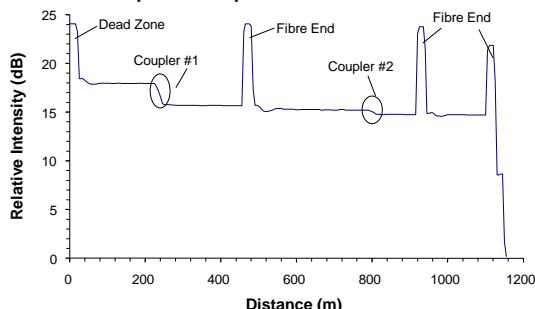
- Examination of basic principles of the OTDR instrument, such as; dead zone, distance and spatial resolution, dynamic range etc.
- Determination of event location and fibre link lengths.
- Identification and measurement of Rayleigh scattering losses along a fibre link and Fresnel end reflections at 1310 & 1550nm.

**OTDR Response of Single-Mode Fibre Length @ 1550nm**



- Measurement of fibre connector and standard splice losses.
- Examination of splices between standard and dispersion shifted singlemode fibre
- Investigation of bend losses in a fibre at different wavelengths.
- Characterisation of optical fibre components (fibre coupler and wavelength division multiplexer).
- Investigation and characterisation of multi-branched optical networks.

**OTDR Response of Optical Fibre Network @ 1550nm**



- Bi-directional OTDR measurements on optical networks
- Fault location and analysis of a series of networks with deliberately introduced faults.

## Product Description

The OPTOSCI Optical Network Analysis educator kit consists of the following hardware elements (when supplied with the OTDR and accessories):

- Network box containing 3 test singlemode optical fibre networks suitable for uni & bi-directional interrogation. The test networks include various elements, such as; optical fibre directional couplers, simulated faults, fibre splices, standard and non-zero dispersion shifted singlemode fibre, extra fibre lengths, different connectors and a wavelength division multiplexer.
- A 2km reel of connectorised single mode optical fibre.
- Connectorised fibre patchcords.
- Bend loss devices.
- Series of network fault traces for analysis either, as a paper study, or using the trace analysis software, as appropriate.

\* The following items are only supplied if ordered with the ED-NET educator kit. Further details regarding the specifications required for the OTDR instrument and its associated accessories are available directly from OPTOSCI. For those purchasing ED-NET without the OTDR and trace analysis software, then the OTDR unit must have similar specifications to those noted below to enable the operator to perform the full range of ED-NET experiments.

- A commercial OTDR\* instrument operating at 1310nm and 1550nm, with SC connectorised singlemode fibre output, internal trace storage and USB memory stick or PC connection facility.
- Trace analysis software\* to allow the students to analyse the traces acquired on the OTDR remotely on a PC.

In addition, a comprehensive literature package accompanies each educator kit:

- Student laboratory manual, describing the background theory and experimental procedure, with associated exercises to encourage the student to discuss the implications of their results.
- Instructor's manual dealing with all aspects of using the equipment and providing sample results for the experiments and exercises.
- Extensive lecture notes on optical time domain reflectometry and fibre optic components detailing the principles of all the issues explored in the laboratory exercises.
- A comprehensive set of tutorial examples and their solutions.

## Ordering Information

**ED-NET Optical Network Analysis w/o OTDR unit**

**OTDR Dual wavelength OTDR + accessories**

Since OPTOSCI are committed to continuously improving the design and performance characteristics of our products, these specifications are subject to change without notice.

Date: March 2018