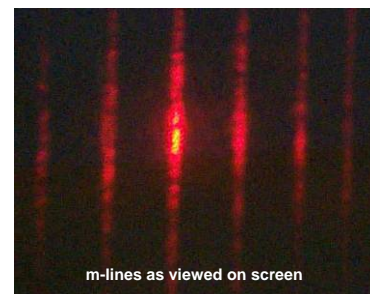
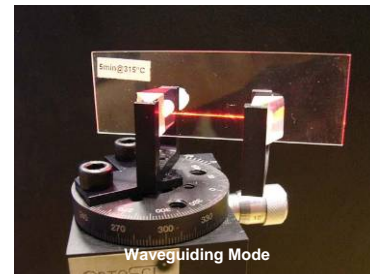


Educator Kit

WAVE

COMPREHENSIVE LABORATORY BASED EDUCATIONAL PACKAGE INVESTIGATING MODE PROPAGATION IN OPTICAL WAVEGUIDES



MAIN FEATURES AND BENEFITS:

- All optical, optoelectronic and opto-mechanical 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 significant course, literature and hardware development effort

THE EXPERIMENTAL INVESTIGATION* ADDRESSES:

- Prism coupling and waveguide measurements
- Step and graded index waveguides
- Measurement and analysis of mode spectra
- Mode effective indices and index profile determination
- Design of single mode waveguides

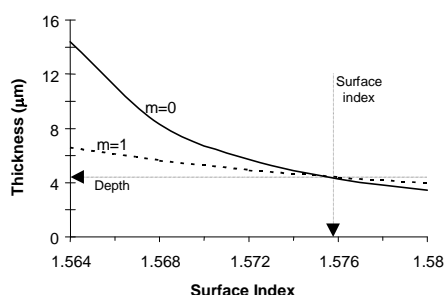
*Full details of the experiments and equipment specifications are provided overleaf

Laboratory Exercises

The WAVE module enables the student to investigate mode propagation in, and characterise, multi mode and single mode planar waveguides. The experimental investigations include:

- Selective launch of modes (TE or TM) into step index and graded index multimode planar waveguides using prism coupling techniques and threshold conditions for the excitation of specific modes.
- Measurement of the mode spectrum, modal effective indices, and the polarisation dependence of various designs of multimode (step and graded index) planar waveguides using prism coupling techniques and m-line investigations.
- Estimation of the refractive index profile and depth of the multimode waveguides under study (see sample results below).

Determination of Surface Index and Depth of Graded Index Waveguide



- Design of a single mode waveguide from an appreciation of mode cut-off concepts, and measurements of waveguide depth and modal effective indices.
- Experimental confirmation of single mode operation in a pre-fabricated waveguide which closely matches the student's design.

Product Description

The OPTOSCI Optical Waveguiding module consists of the following hardware elements:

- An optical rail bench fitted with a visible semiconductor diode laser with integral drive electronics plus mount, a polariser with a graduated rotational mount, a mounted lens and a precision graduated rotation stage with y- and z- translation mounts.
- The rotation stage is fitted with a high index prism coupling assembly into which the waveguide is mounted.
- A selection of multimode and single mode step index waveguides fabricated by thin film deposition.
- A variety of graded index multimode and single mode waveguides fabricated by glass ion exchange.

In addition, a comprehensive literature package accompanies the module:

- 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 basic optics and waveguiding phenomena detailing the principles of all the issues explored in the laboratory exercises.
- A comprehensive set of tutorial examples and their solutions.

Related Modules and Kits

- A separate Reflection & Refraction module (R&R) is also available examining the conditions under which optical waveguiding occurs in dielectric media (including Snells Law, Fresnel equations, total internal reflection, etc).
- Note that our ED-WAVE, Principles of Optical Waveguiding educator kit (see separate datasheet for details) includes all of the hardware and literature to perform the R&R and the WAVE experiments sequentially.

Waveguide Analysis Software

- **SWAN(MIC)**: Excel based optical waveguide analysis software for use with WAVE allowing the user to study planar optical waveguides experimentally and theoretically (see separate datasheet for full details).

Ordering Information

WAVE	Optical Waveguiding Module
R&R	Reflection & Refraction Module
ED-WAVE	Principles of Optical Waveguiding
SWAN(MIC)	Waveguide Analysis Software

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