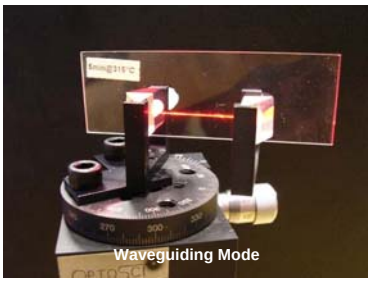
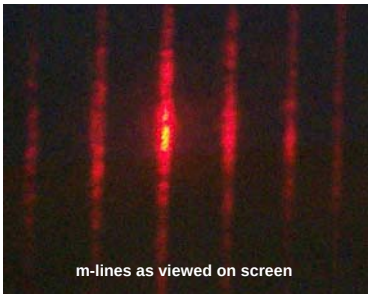
Optical Waveguiding Module

Educator Kit WAVE

COMPREHENSIVE LABORATORY BASED EDUCATIONAL PACKAGE FOR INVESTIGATING OPTICAL WAVEGUIDING





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**

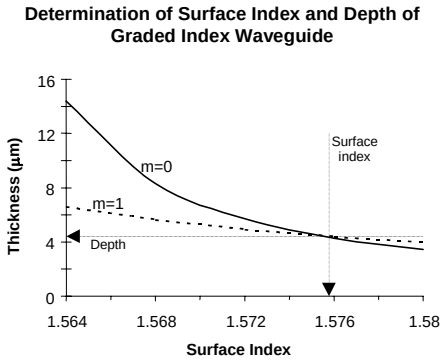
OPTOSCI Limited
9 Cambuslang Road
Glasgow G32 8NB
Scotland

Tel / Fax: +44 (0)141 641 2344
E-Mail: info@optosci.com
www.optosci.com

Laboratory Exercises

The WAVE module enables the student to investigate mode propagation in 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).



- 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:

- A set of student laboratory manuals, describing the background theory and experimental procedure, with associated exercises to encourage the student to discuss the implications of their results.
- A complete 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 WAVE and the R&R 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: June 2011

OPTOSCI Limited
9 Cambuslang Road
Glasgow G32 8NB
Scotland

Tel / Fax: +44 (0)141 641 2344
E-Mail: info@optosci.com
www.optosci.com