



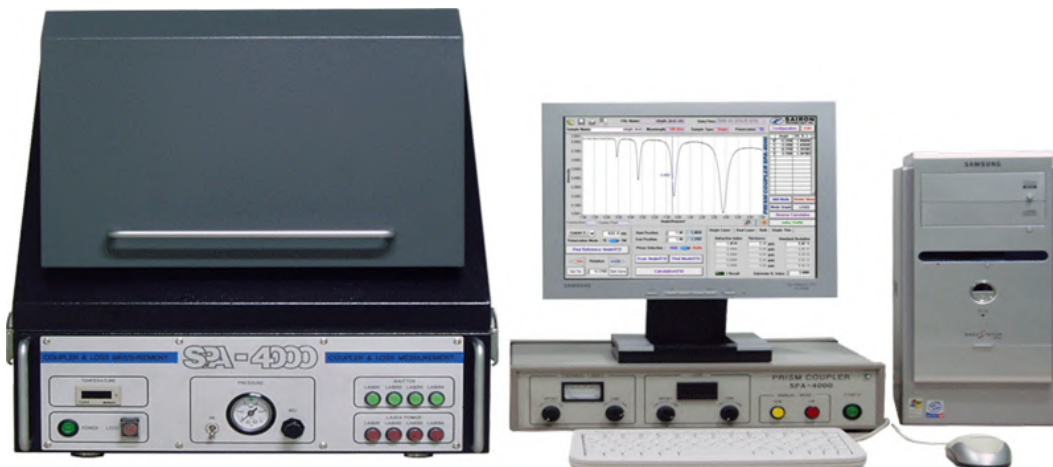
## Ottamagation

NARVA MNT 5  
10117, Tallinn, Estonia  
+3726027968  
<https://ottamagation.com>

# Sairon Prism Coupler

## Refractive Index & Propagation Loss Measurement

Sairon Prism Coupler has been supplied mainly with leading companies, research institutes, and universities in Asia including Korea, Japan, China, Taiwan, Singapore, Malaysia, etc. Now this excellent technology is available to all our EU customers.





## Key Features

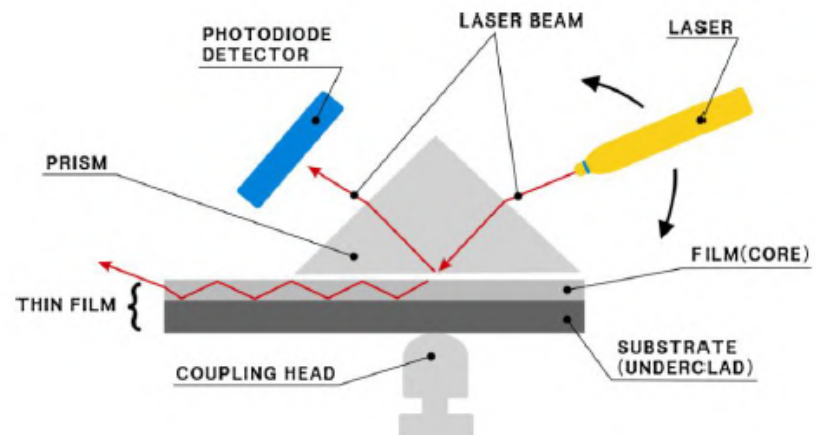
- High resolution measurement for both refractive index and thickness of thin film
- Highly precise propagation loss measurement ( $\sim 0.05\text{dB/cm}$ )
- Accurate refractive index measurement of bulk or substrate materials
- Thermo optic coefficient ( $dn/dT$ ) measurement
- VAMFO Measurement for thick film
- Dual layer film measurement
- Birefringence measurement (TM mode)
- Rapid & Easy measurement
- Up to 4 lasers mountable (405 nm  $\sim$  1550 nm)
- Index profile for the film with graded index
- No information requirement of lower layer for dual layer film
- Sample rotation system (-90  $\sim$  90 degree)
- Unrelated film / Substrate combinations

## Applications - for R&D or Inspection

- Polymer (film, polyimides, photoresists, etc)
- High performance films/plastics
- Optical Waveguides research
- Refractive index measurement for bulk/substrate
- Optical components for optical communication
- Plastic Optical Fiber (POF)
- Photonic devices

## Principle of Prism Coupler

The technique consists of measuring the angles at which a prism will couple light from a laser beam into the sample film. The thickness and refractive index of the film are calculated from the measured angles. Measurements are made by loading the sample against the prism and rotating the

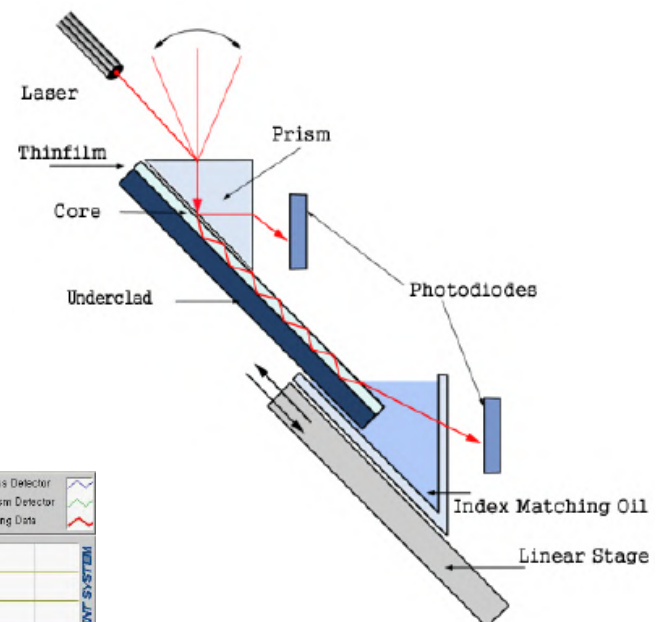




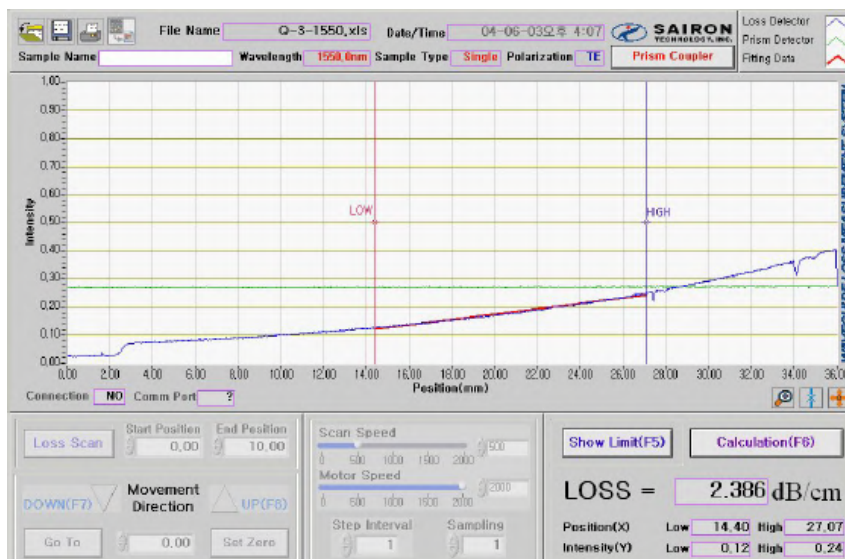
laser light until a coupling mode occurs as shown by a minimum output from the photo detector. The angle is measured and the rotation continues until the next coupling mode is observed. Typically, the first two coupling modes are measured; however, as many as eleven modes have been measured on some of the thicker films. By measuring those angles, refractive index and thickness of film can be mathematically calculated and determined.

## Propagation Loss Measurement

When a thin film is immersed into a matching oil with slightly higher refractive index than the film, guided beam comes out of the waveguide. By detecting the outgoing beam through the matching oil and recording the intensity of it, loss can be calculated as a function of propagation distance.



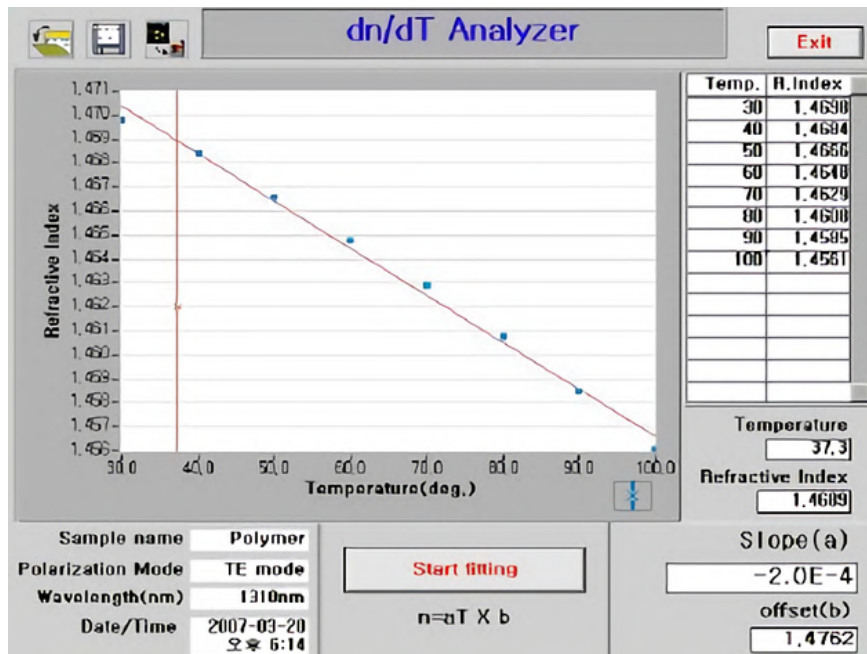
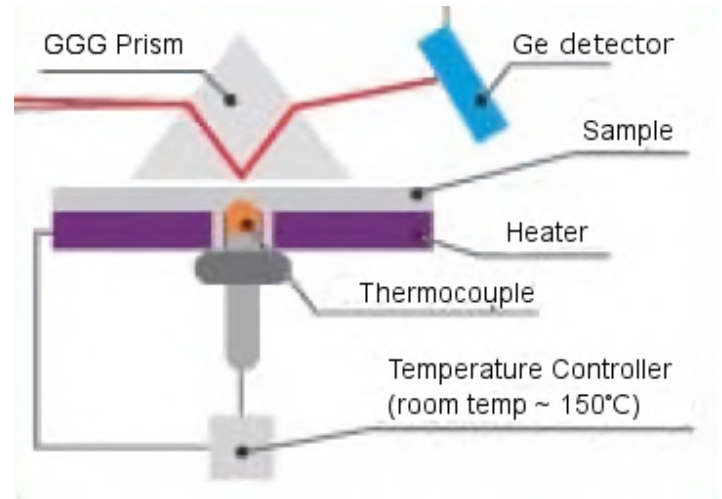
### Highly precise measurement below 0.05dB/cm





## Thermo Optic Coefficient (dn/dT) Measurement

With optional temperature control unit, thermo optic coefficient (dn/dT) of sample can be measured in the range between room temperature and 150°C. Thermo optic effect is defined as a change in refractive index as a function of temperature change (dn/dT). Innovative thermo coupling method realizes the optimal thermal conduction from heater to sample achieving sample temperature accuracy as good as +/- 1°C (~100°C) and +/-2°C (100~150°C).

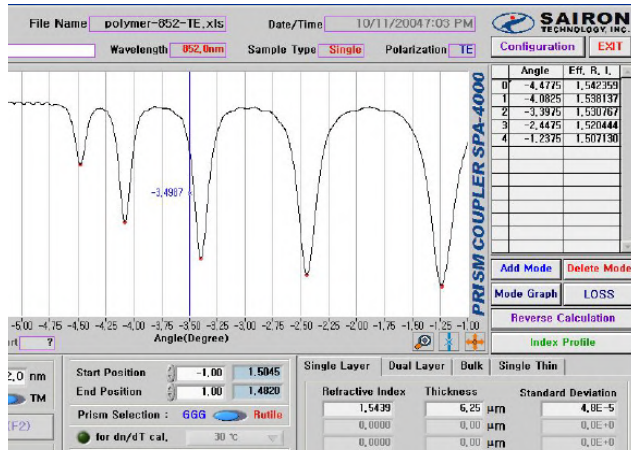




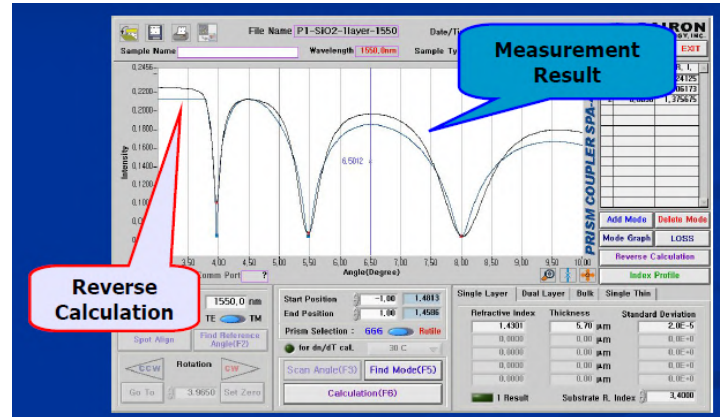
## Analysis software

Easy-to-use, Intuitive, with convenient tools, Working with any Windows computers

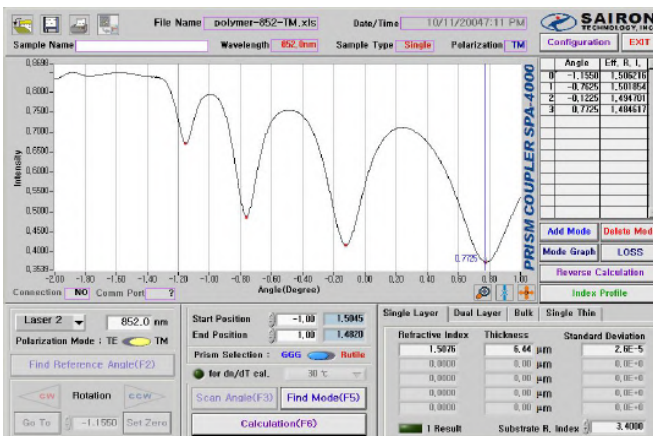
### Single layer analysis graph



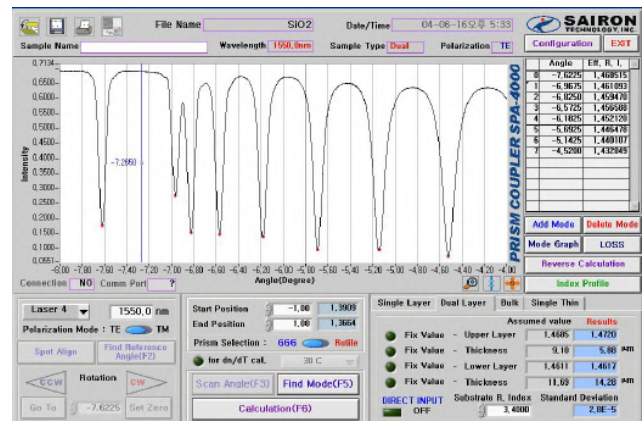
### Single layer reverse calculation graph (to check if measurement result is reliable)



### Single layer TM mode analysis graph

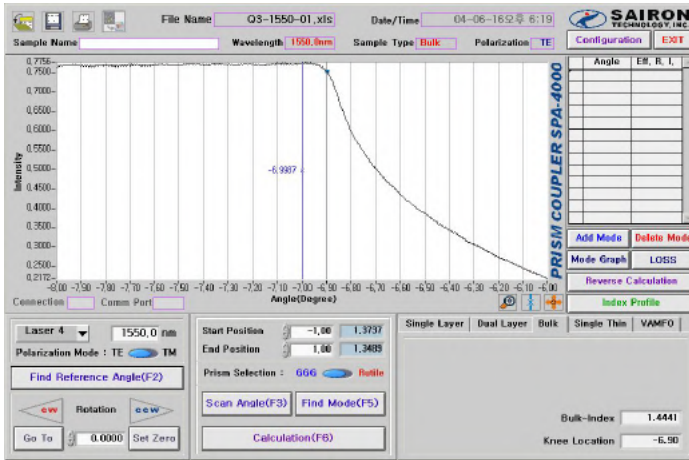


### Dual layer analysis graph

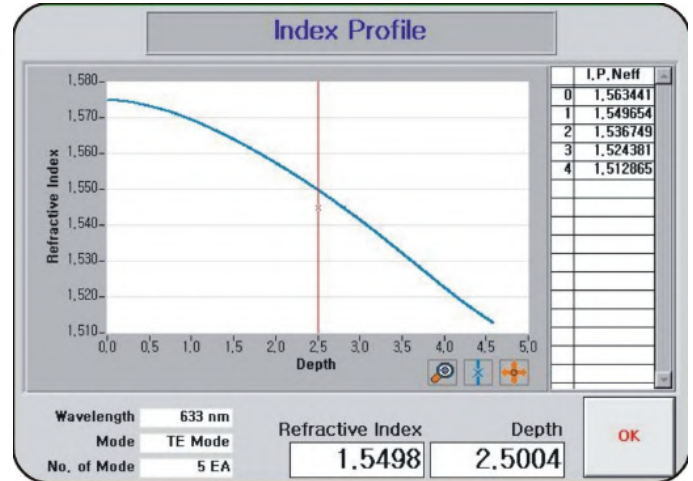




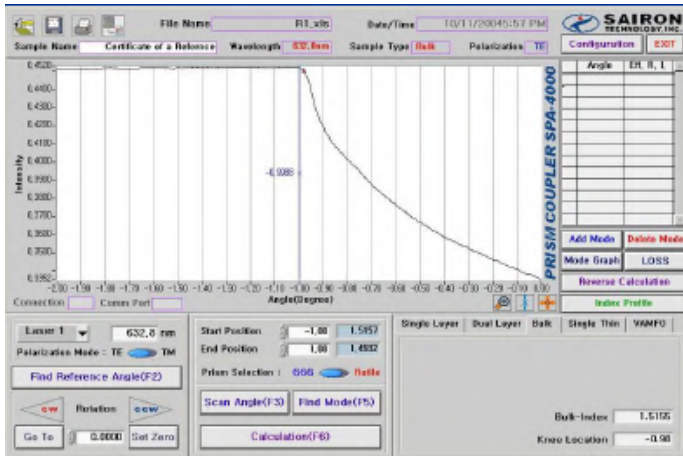
### Bulk analysis graph



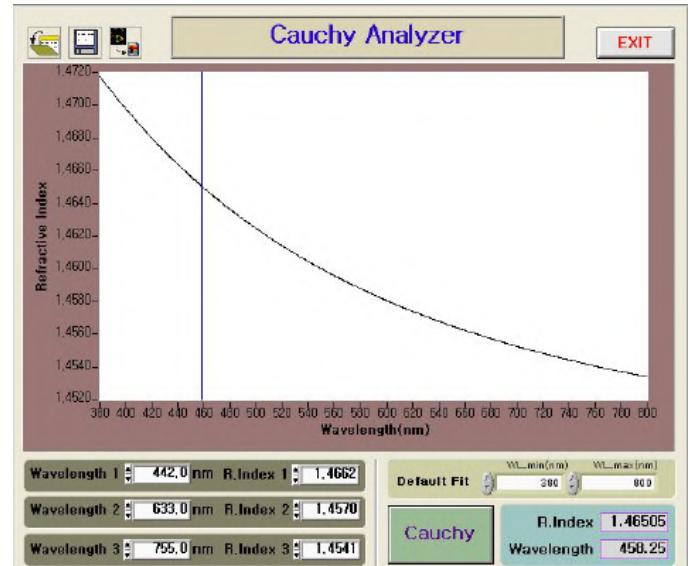
### Grade refractive index analysis graph



### Liquid analysis graph



### Cauchy analysis tool





## Specification

Measurement		Specifications
Refractive Index	Index measuring range (GGG prism)	1.0 to 1.8
	Index measuring range (Rutile prism)	1.8 to 2.45
	Index accuracy	$\pm 0.001$
	Index resolution	$\pm 0.0005$
Thickness	Thickness measuring range	0.4 to 20 $\mu\text{m}$
	Thickness accuracy	$\pm 0.5\%$
	Thickness resolution	$\pm 0.01 \mu\text{m}$
Liquid (index only)	Index measuring range	1.0 to 2.4
	Index accuracy	$\pm 0.0005$
Thermo-Optic Coefficient	Temperature measuring range	Room Temp to 150 $^{\circ}\text{C}$
Loss Measurement	Measuring limitation	below 0.05 dB/cm

## Configuration

### Basic

- 632.8 nm He-Ne Laser
- GGG( $n=1.965$ ) prism & Holder (index : $<1.8$ )
- One controller and PC interface(RS-232)
- Si-photodiode Detector
- TE measurement
- Analysis software (O/S : MS Windows)

### Options

- TM Mode option for each wavelength
- Ge-Detector for Infrared Laser
- Rutile ( $n=2.865$ ) prism for high index refraction (index:1.8~2.45)
- Laser Diode Module(405~1550 nm); user's choice
- Sample Rotation system (-90 ~ +90 degree)
- Thermo optic coefficient measurement system ( $dn/dT$ )
- Liquid measurement system
- Propagation LOSS measurement system

