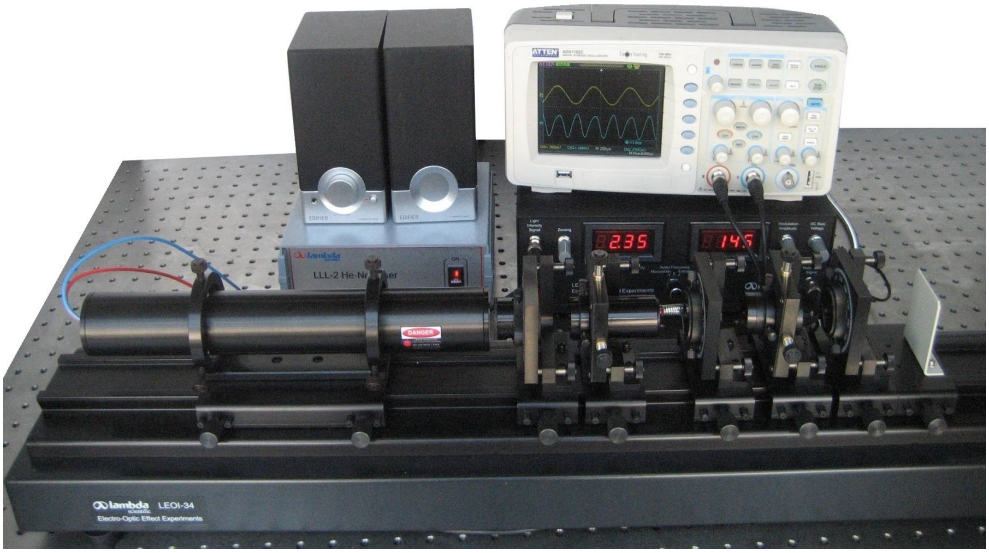
lambda scientific

Construct, Conduct & Comprehend Physics Experiments

LEOI-34 Experimental System for Crystal Electro-Optic Effect

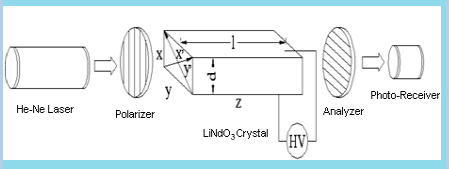
- *Including He-Ne laser with power supply*
- *Precise optical alignment*
- *Observe and measure electro -optic modulation waveform*
- *High sensitivity photoreceiver for stable waveform output*
- *Detailed instruction manual*



Note: oscilloscope not included

Electro-optic effect is a change in the refractive index of a crystal as induced by an electric field. By using a laser amplitude modulator employing the transverse electro-optic effect of a typical $LiNbO_3$ crystal, students can conduct the following experiments:

1. understand electro-optic effect and its applications.
2. be able to measure the half-wave voltage and electro-optic coefficient of crystals.
3. observe a change in optical properties of crystals due to electro-optic effect.
4. observe the interference of focused polarized light as caused by electro-optic effect.
5. conduct experimental demonstration of laser communication.



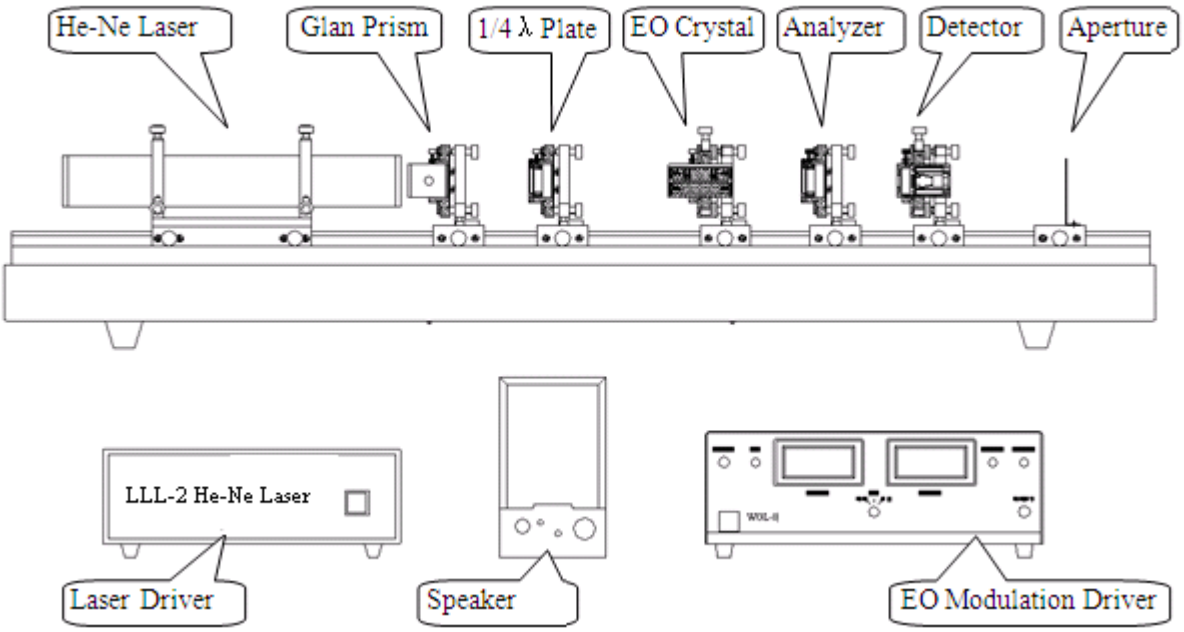
Schematic of transverse electro-optic effect

Experimental Contents

1. Display electro-optic modulation waveform
2. Observe electro-optic modulation phenomenon
3. Measure half-wave voltage of electro-optic crystal
4. Calculate electro-optic coefficient
5. Demonstrate optical communication using electro-optic modulation technique

Parts & Specifications

Power Supply for Electro-Optic Modulation	
Output Sine-Wave Modulation Amplitude	0 ~ 300 V (Continuously Adjustable)
DC Offset Voltage Output	0 ~ 600 V (Continuously Adjustable)
Output Frequency	1 kHz
Electro-Optic Crystal ($LiNbO_3$)	
Dimension	5×1.7×50 mm
Electrodes	Silver Coating
Flatness	< λ/8 @633 nm
Transparent Wavelength Range	420 ~ 5200 nm
He-Ne Laser	>1.0 mW @ 632.8 nm
Rotary Polarizer	Minimum Reading Scale: 1°
Photoreceiver	PIN Photocell



Schematic of system

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