



### DESCRIPTION

The CL-SIP375, a high-technology Optoelectronics Trainer, is designed to demonstrate the use of optoelectronic devices in a wide range of applications including office copy machines, biomedical instruments, telephone communications, aircraft equipment, consumer products and motor vehicles. The course covers the latest state-of-the-art devices used in applying opto-devices to electric power, digital communications, telecommunications and consumer applications. Course participants will learn from laboratory exercises and theoretical information how to use modern light emitter/sensor circuits and hardware in information flow circuits.

The Optoelectronics Trainer includes discussions on the operation and application of light emitters, detectors, Fibre optic cables and their hardware, along with applicable circuits in power, telecommunications, data transfer, bar code scanning and contact less switching. The trainer consists of two insertion panels, a components kit, a polishing kit, a wire jumper kit, and a laboratory manual. Most experimental circuits are prewired, while others must be constructed. A stereo audio cassette can feed two channels of the multiplexer. At the output of the panel, stereo amplified speakers are required.

### FEATURES

- A variety of practical applications of light and infrared emitters and photosensors;
- The use of opto-couplers in power control circuits;
- Applications of fibre optic cable in the transfer of signals and data;
- Circuits and optical components of insertion panels provide for a more rapid assimilation of knowledge;
- Practical components and applications for evaluating and/or designing circuits; and,
- Comprehensive laboratory manual includes self-study procedures and detailed explanations.

### EXPERIMENTAL TOPICS

#### PART 1: INTRODUCTION TO OPTOELECTRONICS

- Defining Optoelectronics;
- Applications and Innovations;
- Control and Communications;
- The Electromagnetic Spectrum;
- Communications by Wireless;
- Early Uses of Light Systems;
- Exciters, Detectors, and Couplers; and,
- Fibre Optics and Hardware.

#### PART 2: THE PHOTO/PIN DIODE, SENSOR, PHOTO-TRANSISTOR, DARLINGTON PHOTOTRANSISTOR AND OPTOCOUPLER/ISOLATOR

- Characteristics and Structure;
- Diode/Diode and Diode/Transistor Coupler;
- Measuring the Current Transfer Ratio;
- Pulse and AC Linear Couplers; and,
- The Optical Coupler.

#### PART 3 LASER AND TRIAC COUPLERS: CIRCUIT APPLICATIONS--POWER

- The Isolated On-Off Controller;
- The Flame-Out Monitor;
- The Optical Logic Controller;
- The Triac Power Controller;
- The Automatic Night Lighting Controller;
- The Automatic Night Flasher;
- Solid-State AC/DC Power Relays; and,
- Power Control with Logic Gates.

#### PART 4: EXCITERS, DETECTORS AND COUPLERS

- Solid-State Exciters---LED;
- The Visual Spectrum;
- The Incandescent Lamp;
- Red and Infrared Exciters;
- Optical Flux Output; and,
- Evaluating Light Emitters.

#### PART 5: PHOTORESISTORS AND SOLAR CELLS: CIRCUIT APPLICATIONS—ANALOG

#### PART 6 : OPTICAL APPLICATIONS—ANALOG

#### PART 7: REFLECTIVE/TRANSMISSIVE APPLICATIONS

- Reflective/Transmissive Sensing; and,
- Bar Code Wand.

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**BASIC EQUIPMENT INCLUDED:**

- One (1) CL-SIP375-1P, Optoelectronics Insertion Panel
- One (1) CL-SIP375-2P, Fibre Optics Communications Panel;
- One (1) CL-S377-CB, Fibre Optic Cable, 3 meters;
- One (1) CL-S377-CF, Fibre Optic Cable, 18 inches;
- One (1) CL-S377-CG, Fibre Optic Cable;
- One (1) CL-S377-CH, Fibre Optic Cable;
- One (1) CL-S378K, Polishing Kit;
- One (1) CL-S300-9, Wire Jumper Kit; and,
- One (1) CL-SIP375M, Laboratory Manual.

**OTHER EQUIPMENT REQUIRED:**

- One (1) CL-S300B, Master Builder; or,
- One (1) CL-S300PSB, Power Supply Base.

**OPTIONAL EQUIPMENT**

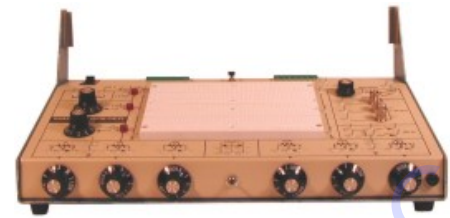
- One (1) CL-SIP375-3, Transmitting and Receiving Circuit Panel for Four-Channel Multiplexing;
- One (1) CL-S300-14A Stereo Speakers and Amplifiers (2);
- One (1) CL-S375 Photometer, Visual;
- One (1) CL-S376 Fibre Optics Cable Inspector;
- One (1) CL-S377K Fibre Optics Components Kit; and,
- One (1) CL-S378K Fibre Optics Polishing Kit.

**SPECIFICATIONS****PANEL 1 (CL-SIP375-1P) - Optoelectronics Insertion Panel**

- ✓ Contains an optical transmitter using visual light;
- ✓ Biasing the LED;
- ✓ Optical transmitter, capable of 1Mb, NRZ code transmission;
- ✓ Flameout monitor (triggering NSCR);
- ✓ Optical receiver;
- ✓ Power circuit control using the DIAC and TRIAC;
- ✓ Night flasher for lighting control of towers; and,
- ✓ Digital receiver.

**PANEL 2 (CL-SIP375-2P). Fibre Optics Communications Panel**

- ✓ Optical transmitter with FM modulation;
- ✓ FM receiver;
- ✓ AM transmitter and AM receiver; and,
- ✓ Pulse-width modulation and pulse-width receiver.

**TOTAL WEIGHT:** 8 lb – 3.64 kg**CL-S300B****CL-S300PSB****Consulab Éducatech, Inc.****5100, rue des Tournelles, Suite 500****Québec, QC Canada G2J 1E4****Phone: 418-688-9067/ 800-567-0791 Fax: 418-688-9526****Email: info@consulab.com Internet : http://www.consulab.com**

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