

Instruction Manual

Digital Stroboscope



Introduction:

The 50-005 Digital Stroboscope is also known as a revolution calibration meter as well as a stroboscopic lamp. It emits an instantaneous intense Xenon flash which can be synchronized with the speed of a target object. This procedure permits calculation of the speed of an object that has an unknown movement speed or rotational velocity. In practice, the target object will appear to be moving slowly or stationary, however, in reality it is moving at a high speed. The 50-005 Digital Stroboscope can also be used to analyze a vibrating object, an oscillating object, and the movement of any high speed target. When using the Digital Stroboscope, these events may be easily photographed using standard digital cameras.

The 50-005 Digital Stroboscope is fully portable yet highly robust in construction thus allowing the unit to be used in a wide variety of scientific and industrial applications. It features a rotating encoder to facilitate rapid frequency modulation. It incorporates a high performance microcontroller as the processing unit and it includes a specific display chip which drives the 7-segment LED to present real-time flashing frequency data. Operation is simple and convenient with complete instructions supplied.

Features:

This instrument has the following features:

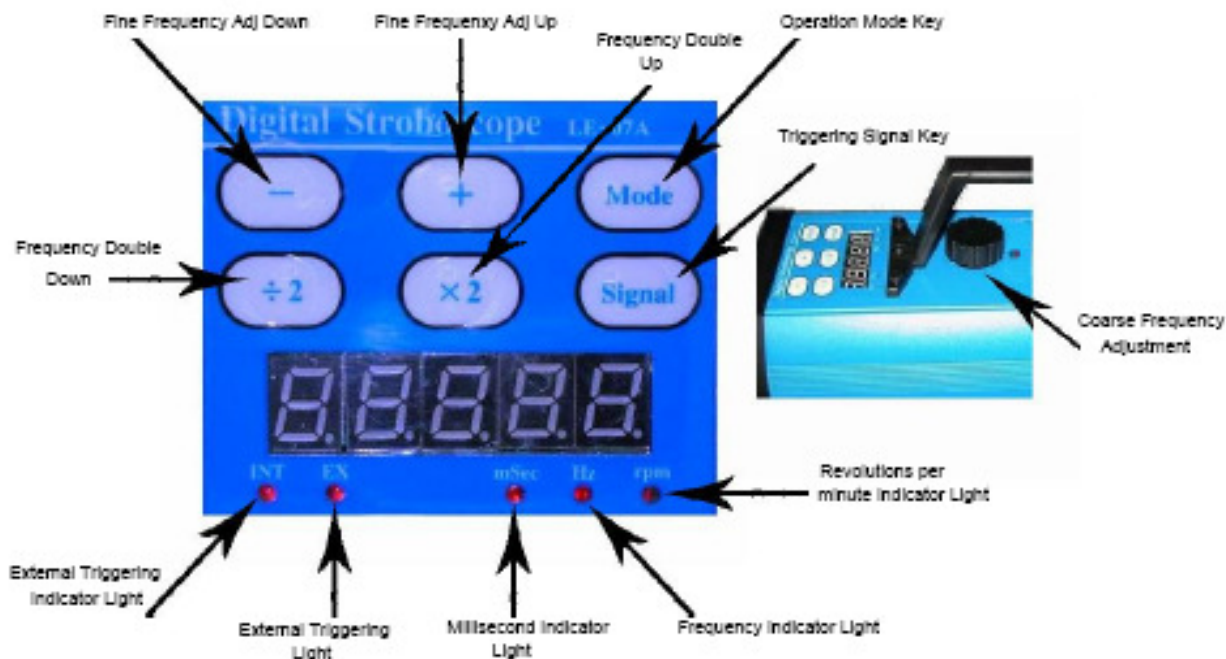
- Superior quality glass reflector and polycarbonate front cover.
- Rapid frequency modulation.
- Automatic pattern tracing when selected to the external triggering operation mode.
- Dual frequency to double current operating frequency for coarse adjustment and half frequency current reduction.
- Fine and coarse adjustment.
- Current triggering frequency trimming.
- Automatic flash stop function, which reduces power consumption and lengthens the service life of the Xenon flash tube. Also: when using frequencies from .2 to 180 Hz continuous operation is permitted as the tube is protected by internal circuitry. Note: When using high flash rates above 180 Hz, flash cycle times should be limited to 2 minutes or less to conserve Xenon flash tube life. This helps to prevent overheating and/or burn out as the ionization rates become excessive at high frequencies (>180Hz).
- Xenon flash tubes can be easily installed in the event of a tube failure.
- Efficient internal overheating protection. Power is automatically restored once the working temperature decreases to the correct temperature.

Technical Specifications:

- 1.) Power supply: AC120V \pm 5%, 1.2A
- 2.) Power Consumption: Maximum power consumption less than 8W
- 3.) Triggering Frequency Scope: 0.2~300 Hz (internal & external)
Recommended Triggering Frequency: 0.2~180 Hz
- 4.) Flash tube intensity: approximately 10000 lux
- 5.) External Triggering signal Scope: 5~12V pulse signal
Outside dimension (L x W x Ht): 215mm x 140mm x 150mm
Net Weight 2 Kg

Control Function Description

Schematic Drawing of Control Panel:



Description of Function Keys:

- **Signal** key: Switches the internal/external triggering operation mode. This mode selects the internal (INT) and external (EX) indicator lamp on the display panel when this key is pressed.
 - ▶ Internal triggering operation mode: Normal operation with the signal frequency provided by the instrument itself. In this mode, the triggering frequency can be increased or decreased by frequency up/down keys. 'x2' key doubles the triggering frequency while '+2' key halves the triggering frequency. The position of the rotary switch determines the flashing speed.
 - ▶ External triggering operation mode: Frequency signal is controlled from a photoelectric switch provided by external equipment (eg. printer, etc.) The display will read "00000" if no outside signal input is detected. Auto tracing flash can be utilized in this model.
- **Mode** key: Changes the units of the present display with the indicator light (mSec, Hz or rpm).
- **x 2** key: Internal triggering double frequency. The current triggering frequency is doubled once 'x 2' key is pressed. This is operational only when internal triggering operation mode is selected.

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- **÷ 2** key: Internal triggering half frequency. The current triggering frequency is reduced by half once '÷ 2' key is pressed. This is operational only when internal triggering operation mode is selected.
- **+** key: The digital value increases slightly once pressed. The rate the value increases depends on the amount of time that the key is pressed. The longer the key is pressed the faster the rate increases.
- **-** key: The digital value decreases slightly once pressed. The rate the value decreases depends on the amount of time that the key is pressed. The long the key is pressed, the slower the rate.

Indicator Lights

- **INT:** Internal triggering indicator light: stroboscope is in the internal triggering operation mode when this light is on.
- **EX:** External triggering indicator light: stroboscope is in the external triggering operation mode when this light is on. (The external triggering plug is above the main power switch, which is in the front panel).
- **rpm:** The indicator light for flashing speed of the stroboscope in revolutions per minute.
- **Hz:** The indicator light for the present frequency of the stroboscope.
- **mSec:** The indicator light for the time between flashes of the stroboscope.

Safety Precautions:

It is suggested that this unit should, in general, be used at a frequency less than 180 Hz. Frequencies over 180 Hz and/or extended periods of use will damage the flash tube quickly and shorten the life of the flash tube dramatically. If the unit is used above 180 Hz, please turn off within one minute. The service life of a flash lamp is about 5,000,000 flashes. This stroboscope is also equipped with a fast acting fuse, and with normal operating conditions this fuse will never break. This stroboscope also has an over-heating protection device. If the internal temperature exceeds 70°C, the over-heating protection device will cut-off the main power. **When the temperature drops below 40°C, the over-heating protection device will reset automatically.**

Warranty and Parts:

We replace all defective or missing parts free of charge. Replacement parts may be ordered using the part numbers above. We accept Mastercard, Visa and School P.O.'s. All products warranted to be free from defect for 90 days. This does not apply to accident, misuse or normal wear and tear. **Made in USA by Science First®.**

Trouble Shooting:

Problem:

The switch is on but the unit will not work and there is no LED display.

Try:

- 1.) Check whether the power supply is plugged in.
- 2.) Check whether the indicator light on the main switch is lit or not.
- 3.) Over-heat protective device has tripped. Allow unit to cool to below 40° C

If above options are all good, please contact Science First for repair.

Problem:

The switch is on, the unit will not work but the LED display is lit.

Try:

- 1.) If the LED displays "-OFF-", turn the adjustment knob.
- 2.) If the LED displays "00000", this means that outside triggering has been selected, press the "signal" key. (The INT indicator light is lit.)
- 3.) Flash tube connected with wrong polarity.



Problem:

The switch is on, the stroboscope works, but there is no display.

Try:

Please contact Science First for repair.

Problem:

The external triggering will not work.

Try:

- 1.) Check to see if "EX" indicator light is lit or not.
- 2.) Check to see if the input socket is properly connected.

Problem:

The external trigger will not display the frequency.

Try:

Please contact Science First for repair.

Problem:

Unit works, but flashes are missing.

Try:

- 1.) The flash tube is hot from running at a higher frequency for a long time. Turn off the unit for five minutes to allow it to cool down.
- 2.) The flash tube needs replacing.

When replacing the Xenon lamp, care must be taken to attach the cathode to the negative output, and the anode to the positive output. Positive output has a RED mark on the screw terminal. Please refer to the following photos to identify the lamp polarity. **Do not touch lamp with bare hands.** Use gloves or a clean dry towel to handle. Any oil transferred to the lamp from touching the lamp will decrease lamp life.



This side out

Replacement Xenon Tube - #85-0005