

# LED STROBE UNIT

N99-A05-7846



**Manual of Operations**

**IMPORTANT!**  
**Read the following before using this equipment:**  
Carefully follow all instructions and observe all precautions given in this manual

## CAUTION

- \* There is a risk of personal injury or property damage if the equipment is mishandled.
- \* Do not disassemble or modify. Abnormal heating or transistor rupture may cause an injury or accident. Never disassemble or modify the equipment.
- \* Do not subject to strong shocks or vibration. The equipment uses precision parts.
- \* Do not drop the equipment, particularly into water. The unit will break.

## CONTENTS OF THE PACKAGE

- \* One (1) LED strobe unit
- \* One (1) connecting cable for the frequency measuring instrument

## EQUIPMENT SPECIFICATIONS

- \* Light source: High-output white LED (350mA, 1W max)
- \* Variable frequency range: 2.5 to 250 Hz; continuous fine adjustment in 4 ranges
- \* Flash pulse width: Fixed for each frequency range (4-step fix)
- \* Power source: Eight (8) R03 (AAA) batteries (not included).
- \* Input/output: external LED connection terminal and frequency measuring terminal
- \* Use high-performance alkaline batteries (oxyride batteries recommended)



## DESCRIPTION OF THE EQUIPMENT

Flash frequency is adjusted with a combination of two switches and a knob. The flash pulse width becomes shorter as you select a higher frequency range, requiring no user adjustment. The equipment is not provided with an instrument to display flash frequency. It is recommended to prepare a digital multi-meter with a frequency measuring range. Use the provided cable to connect a frequency-measuring instrument to the strobe unit.

## MEASURING MODE

- \* DCV: 400mV/4/40/400V
- \* DCA: 400uA/2/40/200mA
- \* Resistance: 400/4k/40k/400k/4M/40M

- \* Frequency: 10/100/1k/10k/100k/1M/10MHz
- \* ACV: 4/40/400V
- \* ACA: 400uA/2/40/200mA
- \* Capacitance: 40nF/400nf/4uF/40uF

Table 1. Setting Flash Rate

Switch combination	Flash frequency (Hz)	Measuring range (rpm)	Flash pulse width (us)
R2, R4	2.6 ~ 50	156 ~ 3000	724
R2, R3	3.4 ~ 65	204 ~ 3900	540
R1, R4	6.0 ~ 120	360 ~ 7200	311
R1, R3	15.0 ~ 250	900 ~ 15000	127

\* Due to the inherent errors of the electronic components of the circuit board, the values shown in the above table may vary slightly depending on individual units. The flash pulse widths are the design values.

## HOW TO USE

### INSERTING THE BATTERIES

- Identify two notches between the rear of the strobe unit and the cover. Insert the tip of a flat screwdriver into one of the notches and carefully pry the cover open.
- Identify the battery box at the rear of the strobe unit. Insert eight (8) batteries into the box.  
NOTE: Use new high-performance R03 (AAA) alkaline or oxyride (recommended) batteries and do not mix new and old batteries. For best results use batteries of a major brand.
- Replace the cover after inserting the batteries.

### BASIC OPERATIONS

- Toggle the power switch to the Power ON position on the control panel at the upper right-hand corner. The LED lights up and the system is ready to start.
- Adjust the LED flash rate (light emitting speed). The flash rate is adjusted using two switches of R1-R2 and R3-R4, and a knob. The lowest flash rate range is obtained by setting the switches to positions R2 and R4, respectively. The lowest flash rate in the selected range is achieved by turning the knob to the extreme left. The flash rate increases as you turn the knob to the right. Table 1 shows the relationship between the combination of the two switches and the LED flash rate.

### MEASURING LED FLASH RATE

This unit is not provided with a display panel to indicate the measured LED flash rate. To measure motor speed, etc., connect a frequency counter or a digital multi-meter with the appropriate frequency measuring range to the frequency measuring terminal on the right-hand side of the strobe unit. The flash rate is read by the frequency (number of flashes per second).

## EXAMPLES OF EXPERIMENTS

### MEASUREMENT OF SPEED OF THE PROPELLER MOTOR

Adjust the flash rate of the LED so that the three propeller blades look stationary. **Note that the three propeller blades look stationary at flash rates of other than the correct speed.** Mark one of the three blades with a black circle. When the three blades look stationary, check for the mark on the blade. If you see the mark on all three blades, the LED flash rate is three times the motor speed. When you see the mark on just one of the blades, the motor speed is synchronous with the LED flash rate. To start with, select the R1 and R3 switch combination and set the highest flash rate with the knob. Gradually slow down the speed until you see the black mark on just one blade, and then read the frequency (Hz). The correct speed may be obtained with a switch combination other than R1 and R3, but the blades are blurred.

### STORAGE PRECAUTIONS

Remove the batteries from the equipment when not using for a long period of time. If left in the equipment, the batteries may leak and damage the electronic circuits, causing the equipment to malfunction.

## ACCESSORIES (SOLD SEPARATELY)

### WIDE-ANGLE LED MODULE

The wide-angle LED Module is designed with a 110 degree radiation angle to permit the observation of wide-range objects. By connecting this module to the external terminal of the Strobe Unit, you can easily conduct and observe wide-range experiments.



### LED STROBE ADAPTER

Low-frequency transmitters are generally available in high school science classrooms. By connecting the LED Strobe Adapter to a low-end frequency transmitter, you can use it as a Strobe Unit. The AC adapter with three wide-angle high output LED's supplies power to provide a bright wide-range flash.

