

Xenon Stroboscope IPC-2816-L

Internal triggering

With the switch set to INT, the xenon discharge tube can be made to flash at any rate from 1 to 300 flashes per second.

The required range should be set on the three-position switch and the fine control should be adjusted until the desired flash rate is achieved. This can then be read from the three-digit display.

External Triggering

When the trigger switch is set to EXT, a flash is triggered each time the pair of 4mm sockets marked EXT on the rear panel are short-circuited. This can be done by means of a reed switch, photodiode, etc.

Alternatively, the stroboscope can be triggered by the output from a signal generator or TTL circuit. When using a signal generator, a signal amplitude of 5V is required. For maximum brightness when using a signal generator or TTL output, set the range switch to the range covering, or nearest to, the triggering frequency.

If necessary, the flash rate can be phase-locked with the motion of a vibrating object by driving both the stroboscope and the object from the same signal generator. External attenuation of the vibrations may be required (eg by using a rheostat) because the signal amplitude for the stroboscope must not fall below 5V.

Suggested applications

The uses of stroboscopes are numerous but the following are a few typical examples.

1. To measure the speed of a rotating wheel

Initially, it may be helpful to mark a white dot on the rim of the wheel. With the trigger switch on the stroboscope set to INT, direct the stroboscope flash towards the rotating wheel. Increase the flash rate to the highest at which the dot appears stationary. The flash rate is then equal to the rotational speed of the wheel in revolutions per second.

Care must be taken to avoid anomalous results, for the stroboscope can give misleading effects, as the following example shows:

A dot on the rim of a wheel rotating at a speed of 30 revolutions per second will appear stationary when the stroboscope is set to 5, 6, 7.5, 10 and 15 flashes per second. Under these conditions, the dot will be illuminated every sixth, fifth, fourth, third or second revolution respectively and, in consequence, the image of the dot will appear to flicker.

When set to 60 flashes per second, two stationary dots will appear on either side of the wheel. At 90 flashes per second, three dots will be visible, spaced around the rim of the wheel etc.

However, when the stroboscope is correctly set to 30 flashes per second, one bright, stationary image of the dot will be seen.

2. To set a rotating or vibrating object to a required frequency

Set the trigger switch on the stroboscope to INT and the flash rate to the desired frequency. Regulate the frequency of motion of the object to find the lowest at which light from the stroboscope makes the object appear stationary. Again, it may be of help to make a reference mark on the object.

3. Stroboscopic photography

With the trigger switch set to INT, select a suitable flash rate; 10 per second is a good optimum value. For best results, bright reflective objects should be used against a dark background in a darkened room.