

## SIGNAL GENERATOR – ‘tri-mode’

Cat: LB3758-001 signal generator ‘Tri Mode’. Output: 0.5A

### DESCRIPTION:

The IEC ‘Tri-Mode’ Signal Generator is a multi purpose instrument for the electronics laboratory. It provides the technician or student with a very convenient multi purpose instrument. It provides a high power output up to 10V p/p at a current of 0.5 amp.

The ‘Tri-Mode’ is a ‘3 in 1’ instrument. A well regulated power source, a broad range and high power signal generator and an audio amplifier with inbuilt speaker. The signal generator output is selectable to be sine, triangular or square in shape and it will supply high currents directly to loads which makes an external amplifier unnecessary.

**LB3758-001 signal generator ‘Tri-Mode’ 0.5A output**



Physical size: 325x170x105mm LxWxH

Weight: 2.9 kg

**NOTE:** It is planned to upgrade this instrument and to provide a sloping front panel and a more modern appearance.

The newer curricula requires basic electronics to be taught including the application of ‘Photonics’. To provide this equipment, IEC will soon have a lower cost and more basic equivalent to this useful instrument. It is called the ‘Mini-Lab’ (LB3759-001) and can be used for general electronics but particularly for the new IEC ‘Electronics and Photonics’ trainer (EM1765-001).

**POWER SUPPLY:**

For general electronic work, both AC and DC power outputs are provided.

**AC. Output:** 6 & 12 Volt AC at 1 amp. continuous. The outlets are fully floating and are protected by automatic self-resetting devices against overload and short circuit

**DC. Output:** Regulated and metered positive and negative outputs, each fully adjustable from +/- 1.2 to 20 Volts DC at 250mA. continuous (300mA max)

OR

+2.4 to 40 Volts DC when load is connected across the outer terminals. The meter will monitor voltage of only one half of the output (0 - 20 Volt) and the actual output will be double the voltmeter reading.

**Regulation:** Better than 20mV from no load to 250mA.

**Ripple:** Better than 10mV RMS.at 250mA.

**SIGNAL GENERATOR:**

**Range:** Very wide range: 0.1 Hz. to 100kHz. over 6 ranges.

**Modes:** Sine, Triangular, Square (pos.& neg. excursions), Square (pos. only).

**Distortion:** Sine. Within 2% under 20kHz.

Triangular. Linearity within 1% under 20kHz.

Square. Rise time less than 1 microsecond at 5V. peak to peak.

**Outputs:** **x1 range:** 0-1 Volt peak or 0-2 Volt peak/peak

**x10 range:** 0-10 Volt peak or 0-20 Volt peak/peak.

The output is current limited by the impedance of the applied load up to a maximum of 500mA. Current limit is automatic by reducing the output voltage as the current rises.

**NOTES:** Peak to peak voltage is the addition of both the positive and the negative peak voltages of the AC waveform. Most waveforms have both positive and negative going voltage peaks but notice that the "Square Wave (pos.only)" selection has a positive direction only and there is no negative going voltage.

The output voltage can be controlled smoothly from zero to 10V peak on the output but since the output is automatically current limited, a short circuit on the output will draw 500mA but will not damage the instrument.

If the impedance of the load is so low that it demands in excess of 0.5 Amp, the current limiting feature causes waveform distortion. To avoid waveform distortion, when connecting to very low impedance loads like speakers etc., be sure that the output voltage is set so that the output current does not exceed 0.5 Amp. peak.

**AUDIO AMPLIFIER:**

The IEC 'Tri-Mode' is complete with a useful inbuilt speaker and is provided with a muting switch for when an oscilloscope is connected and sound is not desired.

If the waveform from the amplifier is to be observed, to prevent waveform distortion caused by the inductance of the speaker coil, it is always better to mute the speaker whilst observing waveforms on the oscilloscope, especially at high output settings.

**Inputs:** 15mV. max. via 3.5mm phone jack. Or 150mV max. via 4mm socket terminals.

**Output:** To oscilloscope (CRO) via an internal capacitor.

**NOTE:** For external speakers, the signal may be taken directly from the signal generator output which can supply up to 500mA into any load at up to 10 Volt peak.

**Mains Input:** 220/240V.AC. 50/60 Hz. at 0.5A max.

**Protection:** Internal mains fuse. 500mA.

**IMPORTANT NOTE::** If the gain control of the amplifier is turned to 'full gain', a small signal may be heard from the speaker that changes with the signal generator frequency. This very faint sound is caused by very small and unwanted 'noise' signal within the wiring of the instrument. Please be advised that there is no internal electrical connection from the signal generator to the audio amplifier.

**If it is intended for the amplifier to monitor the output of the signal generator, the input to the amplifier must be connected with cables to the output of the signal generator.**

When this is done, to prevent distortion in the amplifier, the output level from the signal generator **should be a very low level** (almost zero) so that the input of the amplifier is not over-driven. Using a very small input signal from the signal generator, set the output gain control of the audio amplifier to obtain the desired signal volume.

Be sure the sound from the internal speaker sounds 'clean'. Do not over-drive the internal speaker into distortion either by overdriving the input to the amplifier or by overdriving the speaker with the amplifier's volume control.

**Designed and manufactured in Australia**