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LIGHT TO SOUND CONVERTER

Instrument for Detecting and Listening to Light

1m Fiber Optics Light Probe included with equipment

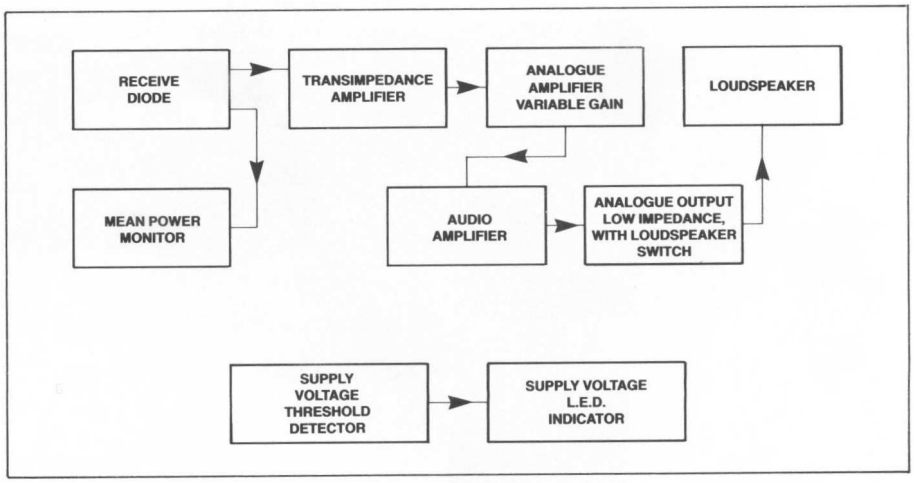
The Ellmax Light to Sound Converter, based on the Ellmax Fibre-Optics Monitor Receiver, is a versatile portable product that has been designed for general light detection and measurement applications, and in particular for light to sound conversion. Visible or infrared light falling onto the sensitive area of the optical diode, which is mounted in an SMA connector housing at the side of the box, is detected and magnified by a variable gain amplifier, and the signal is then connected through an audio amplifier to a loudspeaker. A fiber optics light probe is included with the equipment, although the unit may be used without the probe. The included light probe is based on a 1m length of 1mm core polymer fiber optics cable terminated at one end with an SMA connector for connecting to the unit. Longer lengths of fiber optics cable are available for the light probe.

Applications of the Ellmax Light to Sound Converter include giving an audible indication of the presence of visible or infrared light (i.e. converts light into sound, listening to light, or light to sound conversion) if audio tones are present in the light signal (e.g. an LED with audio-modulated output, mains hum from a light bulb powered by mains electricity, the output of an infrared LED remote control, or any audio-modulated light). A very sensitive receiver circuit enables the detection of optical levels below 100pW.

The audio signals may be measured or monitored at the analogue (analog) output socket of the Light to Sound Converter. Unmodulated optical signals may also be detected by connecting a digital voltmeter (set to DC) to the mean power monitor socket.

The Light to Sound Converter consists of an optical receiver, with loudspeaker analogue output, low impedance audio bandwidth analogue output, and a variable analogue gain control; a mean power monitor output; and a silicon PIN diode mounted in an SMA connector receptacle on a PCB behind an access hole in the case side. Power is from an internal battery (included with equipment) controlled by an on/off switch, or the unit may be powered by a single external DC power supply (9V to 15V), with an LED indicating adequate battery or external supply voltage. The unit is housed in a strong aluminium box.

The following block diagram shows the electronics functions of the Light to Sound Converter in simplified form:



Specifications of the Light to Sound Converter

Photodiode type: Silicon # PIN, sensitive area 1mm^2 (1 x 1mm square) centred and with optical distance of 0.7mm, 400 to 1100nm spectral range for response greater than 10% of peak, with 850nm peak

Optical Connector: SMA *

A fiber optics light probe is included with the Light to Sound Converter. This light probe is based on a 1m length of 1mm core diameter polymer fiber optics cable terminated at one end with an SMA connector for connecting to the equipment, and terminated at the probe end with an AMP DNP connector for general ease of handling. Longer lengths of fiber optics cable are available.

Analogue output (3.5mm mono socket. Connection to this socket automatically disconnects the loudspeaker):
Analogue frequency response at minimum analogue gain:
for output impedance greater than 36Ω: 20Hz to 25kHz
for 8Ω output impedance: 90Hz to 25kHz
Analogue output impedance: less than 1Ω
Maximum power into 8Ω (and at loudspeaker) from analogue output: 0.25W with 15V power supply
Maximum signal at analogue output at zero load current: 3Vpp
Typical response at 850nm wavelength at analogue output: 2.5V/µW to 82V/µW (over analogue gain range), inverted signal relative to optical input
Analogue gain range: 30dB
Minimum optical power for 40dB Signal to Noise ratio: 12nWpp at 850nm

Mean power monitor (3.5mm mono socket):
Output impedance: 150kΩ
Typical response at 850nm: 50mV/µW
Phase of signal: non-inverted relative to optical input
Frequency response: DC response, 0.1s time constant
Maximum signal without overload: 0.5V DC

Optical overload at 850nm:
AC overload: 1.5µWpp
DC overload: 10µW
(at overload, the noise level increases significantly)

Power Supply:
9V PP3-type battery (included with equipment), contained in battery holder at side of case
Optional external DC supply (2.5mm mono socket): + 9V to + 15V (current is 25mA typical at 9V)
Front panel LED indicates adequate supply voltage
Front panel on/off switch is for battery supply only (it does not control optional external supply)

Physical characteristics (the Light to Sound Converter is housed in a strong aluminium (aluminum) box):
Dimensions: 128 x 97 x 75mm approx.
Weight: 500g approx.

Operating Temperature Range: 0°C to 70°C

#silicon or other photodetector option
*SMA or other connector option

CE This Light to Sound Conversion Equipment complies with the EMC (Electromagnetic Compatibility) directive of the European Community and meets or exceeds the following technical standards: EN 50081-1 - "Electromagnetic compatibility generic emission standard Part 1: residential, commercial and light industry."
EN 50082-1 - "Electromagnetic compatibility generic immunity standard Part 1: residential, commercial and light industry."

While the information is true at the time of printing, small production changes in the course of the company's policy of improvement through research and design might not be indicated in these Light to Sound Conversion Equipment specifications.

For further details on this Light to Sound Conversion Equipment contact:
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