Electromax International
Emax-2510 10/18/35 mW
Remote Upgrade

Opto Acoustical Laser

Microphone

Long-Distance Audio Monitoring Device

Motorized Lens/12 VDC

Remote Function

EMAX-2510 10/18/35 mW

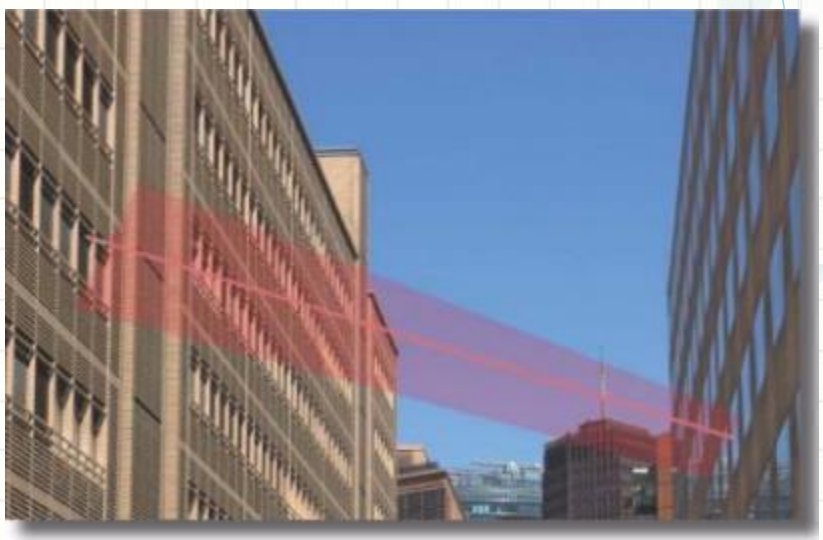
OPTO ACOUSTICAL LASER MICROPHONE
LONG DISTANCE AUDIO-MONITORING DEVICE
MOTORIZED LENS /12 VDC

EMAX-2510-2000 10 mW LRL

- Acoustic surveillance and observation up to 120m/300m without entering the location of the conversation
- The spoken word will be picked up from any cooperative material like paper, metal, plastic, textile, etc.
- Independent form angle of incident
- Easy to control: emitter and receiver in a single optical unit. Quick setup and targeting using an integrated parallax-free laser camera
- Invisible eye-safe laser beam; unparalleled noise performance ratio with low laser power
- No interferences from surrounding noises; not influenced by noise between sensor and target
- Works even with lowest vibration of surfaces allows monitoring through a glass window into interior spaces, i.e. into cars or rooms

Benefits

- Safe, remote operation, 12VDC
- Invisible, eye-safe laser
- Fast setup and targeting
- Works through glass windows
- Physical access to install monitoring devices is not required
- Laser angle of incidence is not critical
- Target surface independent
- Good speech intelligibility and discrimination
- Works through small openings



EMAX 2510 Principal

The Optical Acoustic Monitor opens a new field in remote surveillance of acoustic signals. Based on a sophisticated interferometric laser technology, the EMAX-2510 defines a new gold standard. An invisible infrared laser combined with the latest digital signal processing electronics provides excellent speech detection and discrimination under even the most difficult operating conditions.

The laser detects speech-induced vibration from a wide range of angles of incidence and surfaces, whether the targets are in a room or out in the open. The speech information is extracted from the frequency shift in the backscattered laser light and is therefore not dependent on the surface properties or intensity of the laser.

The EMAX-2510 combines an excellent working range with a low laser power. High performance surveillance combined with a safe and easy operation are key features of the EMAX-2510 Acoustic Optical Monitor.

EMAX 2510 Model

EMAX 2510-35-LRL	**eye safe, 1550mm, incl. EMAX-2510 Controller OAM-E Version K35: <35mW; Long-Range-Lens motorized, 12VDC**	
EMAX 2510-35-LRL-RC-4	motorized lens / 12 VDC, pt- unit, video/audio transmission, remote controller	
LSG-2550	Laser safety goggles for protection against 1550nm infrared laser light, high quality model with a transmittance of 75% for visible light.	
LPM-1550	Compact handheld power meter with power sensor suitable for 700 – 1800 nm, max. 500 mW	

Application

The EMAX-2510 Optical Acoustic Monitor is a sensing system for monitoring the speech of a subject inside cars or buildings for example, by detecting surface vibrations. The aim of this development is to detect acoustic signals over distances of up to 150 meters, widely independent of the target's optical properties. The laser spot is invisible to the human eye and to commercial CCD cameras allowing for targeting through windows in a closed room. The physical principle only allows detection of vibrations where the laser beam is focused, suppressing ambient noise outside the target area.

Principle of Operation

The sensor picks up the vibration of surfaces being excited with sound pressure waves generated by, for example, a person speaking nearby. The best sensitivity is achieved if the objects are soft, lightweight or thin. Typical targets are leaves of in door plants, papers, pictures hanging on the wall, seat cushions, clothing and window panes. Minute vibrations of these objects are detected by the laser beam, converted to an electrical signal, amplified and output as audible sound. The EMAX 2510 operates as an optical long-range microphone. A focused laser beam is targeted onto a suitable object close to the speaker(s). This object is excited to vibrate by the sound pressure of the speaker. The vibration causes a frequency shift of the backscattered laser light, the so called Doppler shift. The frequency shift is extracted from the laser light by means of a highly sophisticated interferometer. The extracted frequency-modulated signal is decoded and converted into a standard voltage signal, compatible with all standard audio processing and recording systems.

The System

The EMAX-2510 Optical Acoustic. Monitor compromises two compact core components: the infrared laser sensor and the monitor unit.

Infrared Laser Sensor EMAX-I

The sensor includes a laser source, meeting the eye safe laser class 3, a precision interferometer, an inline and parallax-free color camera for targeting and the transmitting and receiving long-range optics, corrected for the infrared wavelength of the laser. The long-range objective features a manual fine adjustment of the laser focus and is designed for target distances between 15 meters and 150/300 meters.

The laser source is designed for optimal performance while at the same time avoiding any possibility of eye injuries even during direct exposure to the laser.

Monitor Unit EMAX 2510-E

The Processing Unit decodes the interferometer signals into audio compatible signal paths: a digital, electric S/P-DIF compatible data stream and an analog voltage signal available as PHONES output and as a LINE jack to connect standard audio recording and filtering devices. The headphone output offers some protection against excessive sound levels. Three sensitivity ranges are available to optimize the signal quality. The frequency bandwidth can be limited by band pass filters to the range crucial for optimal speech discrimination. The video signal of the internal camera is available at the Monitor Unit. An additional combined audio/video signal is available at a special HEADSET connector allowing operation of the supplied video goggles.

Targeting, Adjustment and Focusing

A quick setup and targeting is crucial for reliable operation in critical and demanding situations. The EMAX-2510 comes equipped with all of the necessary features and accessories to acquire the most intelligence possible. The Infrared Laser Sensor can be mounted to the rigid tripod with a 3-way geared tripod head and the laser accurately positioned with a 2-way fine adjustment. The following two-part strategy is used for efficient targeting and adjustment of the system:

1. Using the visual signal:

An internal video camera in-line with the laser provides a color image of the target area with a central site that is coincident with the laser.

The laser is in focus when the video image, visible in the goggles, is in focus. Focus is easily achieved by rotating the focus ring on the lens. For low light levels, a mechanical interface is provided at the sensor for adapting night vision scopes.

2. Using the audio signal:

Using the audio signal: Once the target region is localized and the system is focused, the quality of the signal is optimized by simply assessing the audibility of the signal. The operator scans for cooperative i.e. good vibrating surfaces in the target area. The video goggles allow for both visual and audio feedback via the integrated earphones. Using both the acoustic and the visual feedback the operator finds appropriate targeting objects quickly.

EMAX-I-2510 Sensor General Data Laser

Laser EMAX 2510-35

Laser Type	Erbium Fiber Laser
Wavelength	1550nm
Laser Class	3
Laser Type	<35mW

EMAX-I-2510 Sensor General Data Laser

Operating temperature	+5°… +40° (41°F…104°F)	Dimensions	60mm 543mm x 167 mm
Storage temperature	-10°…+65° (14°F…149°F)	Dimensions	633mm x179mm 284 mm Incl. lens shade
Relative humidity	Max. 80% non-condensing		
Protection rating	IP 40 (according to EN 60529)	Weight with lens	Approx. 10.5 kg

EMAX-2510 Controller EMAX-E-1000

Mains Voltage	**AC adaptor: 100 VAC…240 VAC 10% 50/60 HZ DC Voltage Connection: 12 VDC...24 VDC 10%**	**Housing / Protection Rating**	**IP 40(according to EN 60529)**
Power Consumption	Max. 50 W	Housing/Dimensions	225mm x 360mm x 135 mm (1/2 19”, 42 HP/3U
Fuses	**2.0A/slow-blow**	Housing/Weight	6kg
Protection class	**(protective grounding)**	Operating temperature:	+5°C…+40°C(41°F …104°F
		Storage temperature:	10°…+65°C(14°F …149°F)
		Relative humidity	Max.80%, non-condensing

EMAX-2510 Optics

Laser Safety: IEC/EN-2008-07	EMC: IEC/EN 61326-1:2007-12	Emission: Limit Class B IEC/EN 61000-3-3 and 71000-3-3	
Safety of Laser Products, complies to US 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice no. 50, dated 24 June 2007	EMC requirements on Emission and Immunity - Electrical equipment for measurement, control, and laboratory use	Vibration Reliability Tested According to EN 60068-2-6 (IEC 68-2-6) Sine sweep, 10.150Hz, 20X 2G frequency cycle: 10Hz - 15OHz - 10Hz, 3 axes	
Electrical safety: IEC/EN 61016-1:2002-08 (Safety requirements for electrical equipment for measurement, control, and laboratory use)	Immunity: IEC/EN 61016-4-2 to 61000-4-6 and IEC/EN 51OOO-4-11		Maintenance Service interval recommended: every 2 years

EMAX 2510 Outputs

Digital Outputs

S/P-DIF Electrical	on the Front Panel (raw signal)	S/P- DIF Optical	On the back Panel (raw signal)
Data format	**S/P-DIF 43kSa/s**	Data format	S/P-DIF
Sample rate	48jSa/s	Sample Rate	48kSa/s
Resolution	**24bit**	Resolution	24bit
Jack type	RCA (Cinch)	Jack type	TOSLINK

Analog Outputs

LINE OUT (on the Front Panel) Output for analog recording of the audio signal		HEADSET (on the Front Panel)	Output for the video and audio signal:
Voltage swing	**Max. 4V p-p**	Audio signal	Max.100mW/32
Output impedance	620	Video signal	PAL CVBS signal, 1 V p-p/75
Jack type	**RCA (Cinch)**	Jack type	3.5 mm jack plug, 4 pin

PHONES	(on the Front Panel) Output for headphones	VIDEO	(on the Back Panel) Output for the video signal:
Output Power	Max/ 100mW/	Video Signal	Pal CVBS signal, 1V p-p/75
Jack type	3.5mm jack plug, 3-pin	Jack type	RCA (Cinch)

Velocity (on the Back Panel)	Signal voltage output for the velocity signal	RSSI (on the Back Panel)	Output for a DC voltage signal proportional to the logarithm of the optical signal strength
Voltage swing	Max. 10V p-p	Voltage range	0V…+5V
Output impendence	Nom. 50	Load resistance	Min. 10k
Load resistance	Min. 10k	Jack type	BNC
Over range indicator threshold	Typ. 9.5V (peak)		
Jack type	BNC		

Emax 2510- Remote Upgrade

OPTO ACOUSTICAL LASER MICROPHONE
LONG DISTANCE AUDIO-MONITORING DEVICE

MOTORIZED LENS/12 VDC
PT-UNIT
VIDEO/AUDIO TRANSMISSION
REMOTE CONTROLLER

EMAX Quattro IP TX

MILANQUATTRO
RX OLED

EMAX QUATTO

HIGH-SPEED EMAX TCP/IP TRANSMISSION SYSTEM

EMAX STORE AND FORWARD SYSTEM FOR VIDEO AND AUDIO

Main Features

- Frequency ranges 300, 800, 1200 or 2400 MHz (on demand up to 3GHz)
- Output power 100/150/250/1000 mW + optional PO Watt
- 64 GB onboard flash memory (48 hours recording)
- Video Recording with RF Download and real-time video/ audio
- Latest generation H.264/MPEG4 video codec
- EMAX H.264 video (1.5/3/6/19 MBit/sec)
- AAC audio 16 kBit/s-128 kbit/s
- RF band width 1.7/3.4/6.8/19 MHz
- User-selectable video modes
- Integrated anti-jamming mode
- High Level AES encryption (option)

EMAX Quattro Video Receiver

HIGH-SPEED EMAX TCP/IP TRANSMISSION SYSTEM
EMAX STORE AND FORWARD SYSTEM FOR VIDEO AND AUDIO

Main Features

- 2X or 4X diversity highsensitive COFDM Receiver for optimized transmission
- TFT-display or OLED-touch screen
- RF remote-control for all parameters
- RF download mode for TX onboard records, upto 19 MBit/sec, timer controlled
- User-selectable video modes
- USB 2.0 host for direct recording onto USB storage and/or to PC
- LAN interface for streaming and control
- IP/Ethernet Transmission and/or 3G Transfer
- High level AES decryption (option

EMAX QUATTRO TX 1000/2000

Video/Audio/IP-Input 64 GB onboard flash
Transmission: 19 Mbit/sec/128 kBit/sec; bidirectional

Frequency:
300/800/1200 or 2400 MHz

COFDMData: 1.5/3/6/19 MBit

RF Bandwidth: 1.7/3.4/6.7 MHz

Flash -Memory: 64 GB for recording and RF download

Power: 1000 or 2000m W
Supply: 6-32VDC/7.5 W

Dimensions: 113x91x21mm-

4., 5x3, 6x0, 8 inch

Weight: 310gr./10,93 ounces

EMAX QUATTRO 2510 RX STANDARD TFT

USB HDD Recording + PC Interface *I*RS 232 transparent/ Ethernet/ IP TFT screen 8"

Diversity:4X {RF for RC: 2 Watt)
Frequency: 300/800/1200 or 2400 MHz
COFDM Data: 1.5/3/6/19 MBit/sec QPSK/QAM 16RF
Bandwidth: 1.7/3.4/6.7 MHz
Recording: internal 64 GB/48 hours Video+Audio
Dimension: 215x165x 29mm-8,4 x6, 4xl, 1 inch
Weight: 1380 gr./48,7 ounce
Supply: 9-18 VDC/8.5 W

EMAX QUATTRO 2510

Remote Controller for EMAX 2510

EMAX 2510- handheld remote controller for EMAX 2510

EMAX OPT 50

PT for EMAX 2510

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