Technical Data

QUADRA™

Digital IEM System

- IEM (Wireless Monitor) system with digital RF transmission
- 24-bit/48 kHz digital audio
- 2 or 4 channel operation
- Analog or digital AES/EBU inputs
- Low latency of 1 ms or less, even with analog inputs
- Intuitive four channel mixer for the performing artist

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System Overview

The Quadra system provides an entirely new level of audio and RF performance in a wireless monitor system. The combination of analog and digital input capability, ultra-low latency 24-bit, 48 kHz audio, digital RF modulation and discrete four channel mixing capability make the Quadra a truly unique IEM product for mission-critical, professional applications.

The system is designed for line level analog audio signals and AES/EBU digital audio input signals. 48 kHz/24-bit audio, ruler-flat 20 Hz to 20 kHz frequency response, ultra-low distortion and high dynamic range assure excellent audio quality. Housings and panels are machined aluminum with electrostatic powder coated and anodized finishes and laser etched marking for durability. An intuitive mixing interface and comprehensive LCD on the belt pack receiver provide performing artists and monitor engineers alike with a comfortable and confident user experience.

M4 Transmitter

The half-rack transmitter can accept up to four inputs from digital or analog sources. The inputs can be configured as follows:

- Four analog inputs using all four jacks
- Two digital inputs using jack 1 and two balanced analog inputs using jacks 3 and 4
- Four digital channels using jacks 1 and 2

The input connectors are full size balanced XLR types for AES/EBU and balanced line level analog signals. Input preamp circuits use a special balanced amplifier with very high common mode rejection to minimize hum and noise.

Either analog or AES/EBU digital input signals are converted to an internal 24-bit digital format which is then encoded, organized into packets, and passed to an RF modulator using spread spectrum techniques and error correction for robust reception. The modulated RF signal is filtered before and after amplification to suppress out-of-band noise and spurious signals, and a circulator/isolator guards against intermodulation interference (IM).

The transmitter can be free-standing or rack mounted in single units (via an optional rack mounting kit) or in a dual configuration using supplied hardware.

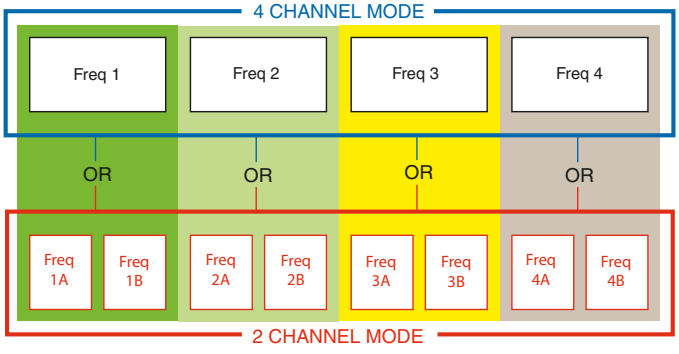
A USB port is provided for firmware updates.

M4 Receiver

The receiver employs advanced antenna switching diversity reception, switching between the antennas during packet headers in order to maintain a seamless audio signal. A configurable four channel mixer on the top of the receiver housing allows the user to mix four discrete audio channels according to the needs of the performance. The headphone jack is fed from a high-quality stereo amplifier with 100 mW available to drive headphones or earbuds to sufficient levels for stage performance or other environments with significant background noise. A high density, backlit LCD allows the user to make setup changes via the available menu options.

Frequency Range

Using the license free 902 - 928 MHz ISM band, this system is outside the normal broadcast frequencies thus providing both technical and operational advantages over standard analog systems.



Two M4T transmitters shown in dual rack configuration.

Multi-Channel Capability

Quadra can be configured to provide either 2 or 4 audio channels. In the 2 channel mode, eight different frequencies are available, each with two audio channels. In the 4 channel mode, four different frequencies are available, each with four audio channels. Multiple Quadra systems can be operated in the same location to provide up to 16 total audio channels between all units.

The performer can then use the on-board mixer to tailor the audio output to his or her tastes or the requirements of the performance at hand.

Ultra Low Latency

Signal delay with digital devices is a concern, particularly when performing artists hear their own voice through the system. Quadra employs new technology to drastically lower the throughput latency to levels far below industry standards.

With analog inputs at the transmitter, the Quadra system adds 1 ms of latency. With digital inputs, the latency is reduced to <0.5 ms.

Audio Signal Monitoring

The signals at the transmitter inputs can be monitored in two ways: using the LCD bar-graph meters for levels and with headphones listening to the actual signals. The LCD bar-graph meters show the audio level range from -60 to 0 dB. When the signal exceeds +20 dBu at an input, the bar graph indicates this with a bright "**!**" at the top of the bar on that channel.

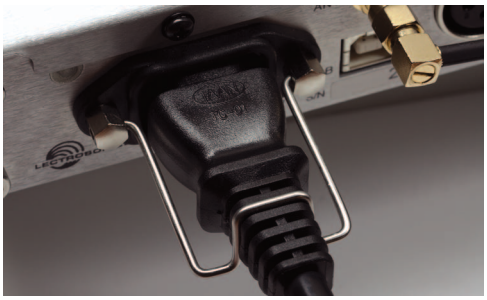
The 1/4" headphone output with retractable volume knob.

Road-Worthy Construction

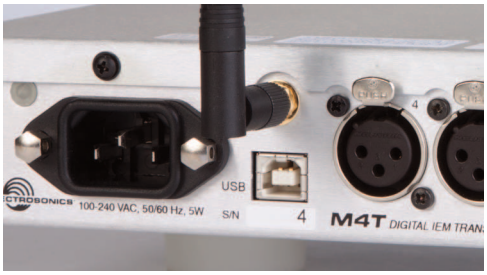
Unlike consumer and "semi-pro" equipment, the Quadra system was designed and developed with the professional touring, installation, theater and broadcast customers in mind.

The receiver case is machined out of solid metal, yet it is lightweight and sleek in order to be comfortable on the artist's body.

The transmitter chassis is all-metal and features a built-in power supply with detachable AC cable. The AC connection includes a wire bail to ensure that the cable does not become disconnected accidentally.



Full-size, locking XLR connectors on the rear panel facilitate connection of the analog or AES/EBU digital input cables.



Superior Sound Quality

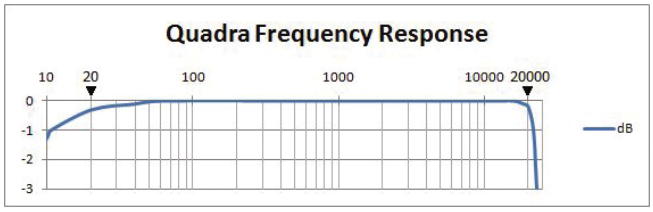
Conventional in-ear wireless monitor systems rely on decades-old technology: FM transmission with multiplexed, companded audio. The Quadra system employs recently developed technology to provide ruler-flat frequency response from 20 Hz to 20 kHz and maximum channel separation. In addition, the digital audio lacks a compandor and the associated artifacts. The result is crystal clear sound with extremely low distortion of <0.05%.

The headphone amplifier provides 100 mW at 32 Ohms, making it possible to drive even the most demanding earbuds or headphones to sufficient levels for the most discriminating artists.

Since all mixing is accomplished in the digital domain, the Quadra system provides superior sound even with complex material used in the 4 channel mode and mixed at the top panel by the artist.

Quadra Summary

The new Quadra system from Lectrosonics features digital RF modulation, two or four channels of 24-bit/48 kHz digital audio, analog or digital inputs, and a unique mixing interface for performing artists. The Quadra system operates in the license-free ISM (industrial, scientific, and medical) band between 902-928 MHz and has a throughput latency of 1 ms for the analog inputs and less than 0.5 ms for the digital inputs.



The M4R diversity belt pack receiver features a user-friendly interface with a high-resolution, backlit LCD and membrane switches. A four channel mixer enables the performer to tailor the mix in real time, based on what is sent to the transmitter from the monitor console. Several channel setups and knob configurations are available, providing users with a variety of choices as to how the system operates. The M4R runs for 6 hours on three alkaline AA batteries.

The M4T half-rack transmitter features transmission power of 200 mW for extended operating range. Locking XLR connectors facilitate up to four channels of either analog or digital (AES/EBU) audio sources to be applied to the transmitter. A large, high resolution, backlit LCD and large membrane switches provide an intuitive interface that is operable even in the most challenging environments. The included hardware supports rack mounting of two M4T units together in a 1RU configuration.

The M4R receiver is delivered in this rugged case.

Specifications

Overall System

Operating Spectrum:	902 - 928 MHz
Center Frequencies (MHz):	
4-channel Mode:	907.776, 912.384, 916.992, 923.904 Four 4-channel systems can operate simultaneously for a total of 16 audio channels.
Center Frequencies: (MHz):	
2-channel Mode:	906.624, 908.928, 911.232, 913.536, 915.840, 918.144, 922.752, 925.056 Eight 2-channel systems can operate simultaneously for a total of 16 audio channels
Modulation Type:	Differential QPSK with Forward Error Correction, spread spectrum
Occupied Bandwidth:	4 MHz (4-channel mode), 2 MHz (2-channel mode)
Audio Sampling:	48 kHz, 24-bit
Latency (overall system):	
Digital:	Less than 0.5 mS
Analog:	1.0 mS
Selectable Audio Inputs:	4 digital 2 digital, 2 analog 4 analog
Audio Performance (overall system):	
Frequency Response:	20 Hz - 20 kHz, ± 0.5 dB
THD+N:	<0.05% (1 kHz @ –10 dBFS)
Dynamic Range:	> 95 dB A-weighted
Adjacent Channel Isolation:	> 100 dB

M4T Transmitter

Power output:	200 mW
Audio Input:	Simulated transformer balanced inputs, clip level adjustable +0 to +20 dBu (or AES/EBU digital standard)
Power requirements:	100 - 240 VAC
Power consumption:	5 Watts
Dimensions:	Height: 1.750 in. / 44.45 mm. Width: 8.375 in. / 212.7 mm. Depth: 7.750 in. / 196.8 mm.
Weight:	2.36 lbs.; 1068 grams

M4R Receiver

Diversity Type:	Switched antenna
Audio Output:	Earphone: 100 mW at 32 Ohms
Power requirements:	3 x AA batteries (4.5V)
Battery life:	6 hours; alkaline AA
Power consumption:	1200 mW
Dimensions:	Height: 4.725 in. / 120 mm. (with knobs) 3.735 in. / 94.87 mm. (housing) Width: 2.75 in. / 69.85 mm. Depth: .960 in. / 24.38 mm.
Weight:	9.14 ounces / 259 grams (with alkaline batteries)

Specifications subject to change without notice.

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