SMV Series

Miniature Transmitters

TECHNICAL DATA

- **Selectable output power to maximize battery life or operating range**
- **Ultra-lightweight, corrosion resistant housing**
- **Water resistant seals for use in damp environments**
- **LCD interface with lockout option**
- **Programmable compatibility modes for use with a wide variety of different receivers**
- **Servo Bias input circuitry with selectable voltage**

To meet the demand for both extended operating range and extended battery life, the “V” series SM transmitters offer selectable output power ranging from 50, 100 and 250 mW on the single and dual battery model. With higher power output, the operating range is improved at the expense of battery life. When range is not an issue, the power can be reduced to extend the battery life.

Both models are compatible with the LectroRM app for *hands free* setup and adjustment using audible tones delivered into the microphone from a mobile phone. The transmitter can be put to sleep to conserve battery power during setup while the transmitter is buried deep inside costuming, then awakened for normal operation when the production begins. Other features include frequency and audio level adjustment and control lockout.

Digital Hybrid Wireless® is a revolutionary new design that combines digital audio with an analog FM radio link to provide outstanding audio quality and the exemplary RF performance of the finest analog wireless systems.

This overcomes channel noise in a dramatically new way, digitally encoding the audio in the transmitter and decoding it in the receiver, yet still sending the encoded information via an analog FM wireless link. This proprietary algorithm is not a digital implementation of an analog compandor. Instead, it is a technique which can be accomplished only in the digital domain.

The process eliminates compandor artifacts, expanding the applications to include test and measurement of acoustic spaces and musical instruments.

*US Patent 7,225,135

SM Series ETSI compliant transmitters are designed to operate with Lectrosonics Digital Hybrid receivers in Nu Hybrid Mode and will yield the best performance when doing so. However, due to the flexibility of digital signal processing, the transmitters can also operate with Lectrosonics IFB receivers and in a special Mode 3 for use with receivers from another manufacturer.

The input section features the unique servo bias input circuitry with a standard TA5M type jack for use with electret lavaliere mics, dynamic mics, or line level signals. A DSP-controlled analog audio limiter is employed ahead of the first mic preamp to protect the entire audio chain from overload. The limiter has a range of more than 30 dB for excellent overload protection and a dual release envelope that makes the limiter acoustically transparent while maintaining low distortion. The limiter recovers quickly from brief transients, with no distortion.

A water resistant control panel with LCD, membrane switches and multi-color LEDs make input gain adjustments, frequency and compatibility mode selection quick and accurate. The battery compartment accepts AA batteries (Lithium recommended).

The housings are machined from solid aluminum blocks to provide an extremely lightweight and rugged package. A special non-corrosive finish resists salt water exposure and perspiration in extreme environments.

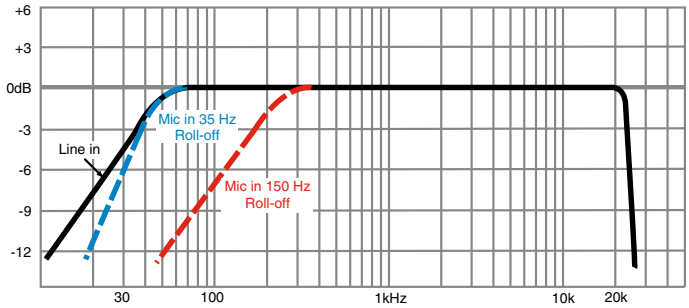
LECTROSONICS®
Rio Rancho, NM, USA
www.lectrosonics.com

High Power Output and Long Battery Life

Variable power provides the choice of maximum power output for extended operating range and interference suppression, or lower power output for extended battery life when operating in less demanding RF conditions.

Adjustable Low Frequency Roll-off

The low frequency roll-off can be set for 3 dB down points at 35, 50, 70, 100, 120 or 150 Hz to control subsonic and very low frequency audio content.



DSP-Based Pilot Tone & Compatibility

The DSP generated pilot tone eliminates the need for fragile crystals and allows a different pilot tone frequency for each of the carrier frequencies in the tuning range of the wireless system. Individual pilot tones significantly reduce squelch problems in multichannel systems where a pilot tone signal can appear in the wrong receiver via intermodulation products.

The DSP also offers compatibility modes to allow compatibility with Lectrosonics IFB receivers, and special Mode 3 in addition to its Nu Hybrid operating mode.

Input Limiter

A DSP-controlled analog audio limiter is employed before the analog-to-digital converter. The limiter has a range of more than 30 dB for excellent overload protection. A dual release envelope makes the limiter acoustically transparent while maintaining low distortion. The limiter recovers quickly from brief transients, so that its action is hidden from the listener, but recovers slowly from sustained high levels, to keep audio distortion low and preserve short term dynamic changes.

The bicolor LEDs accurately indicate limiter activity to assist in setting the input gain for optimal signal to noise ratio and dynamic range.

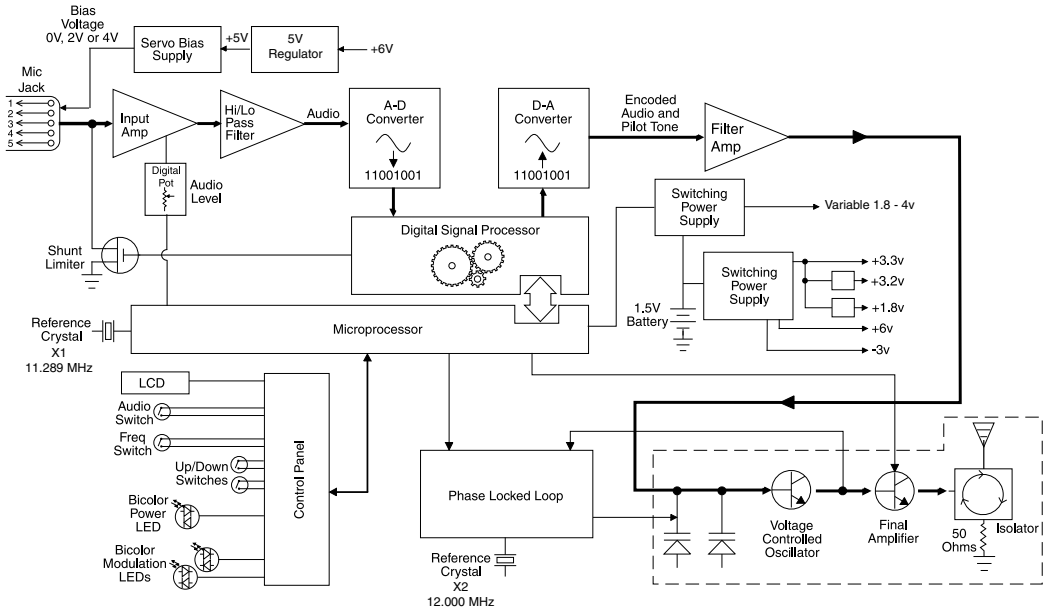
Circulator/Isolator

The transmitter RF output circuit includes a specialized RF device called a “circulator/isolator” or simply “isolator” using a magnetically polarized ferrite to allow RF signals to pass through to the antenna, but block them from coming backward into the transmitter output section. This greatly reduces RF intermodulation produced in the transmitter output stages when multiple units are used in close proximity (a few feet apart). The isolator also helps protect the output stage from electrostatic shock delivered to the antenna. Isolators are common in broadcast and commercial applications, but because of their high cost it is unusual to find them in wireless microphone systems.

GORE-TEX® Vent

In special circumstances it is possible for moisture to be pulled into the housing when a unit is moved from a warm, damp operating environment, turned off and stored in a cool place. As the warm air inside the unit cools a vacuum is created, pulling air in past the exterior of the housing, bringing moisture with it. A special vent in the battery door prevents a vacuum from being created by allowing air to pass but blocking the passage of water.

SMV Series Transmitters Block Diagram



LectroRM

By New Endian LLC

LectroRM is a mobile application for iOS and Android operating systems. Its purpose is to remotely control Lectrosonics Transmitters, including:

- SM Series
- WM
- L Series

The app remotely changes settings on the transmitter through the use of encoded audio tones, which when received by the attached microphone, will alter the configured setting. The app was released by New Endian, LLC in September 2011. The app is available for download and sells for $20 on the Apple App Store and Google Play Store.

LectroRM's remote control mechanism is the use of an audio sequence of tones (dweedles) that are interpreted by the transmitter as a configuration change. The settings available in LectroRM are:

- Audio Level
- Frequency
- Sleep Mode
- Lock Mode

Activation

For a transmitter to respond to remote control audio tones, the transmitter must meet certain requirements:

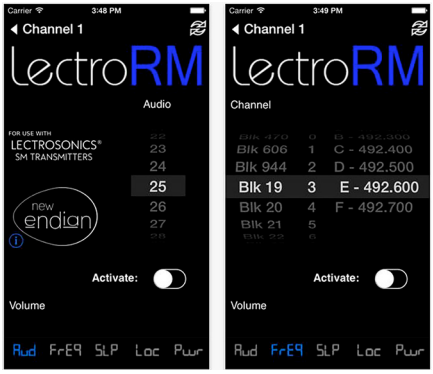
- The transmitter must not be turned off; it can however be in sleep mode.
- The transmitter must have firmware version 1.5 or later for Audio, Frequency, Sleep and Lock changes.
- The transmitter microphone must be within range.
- The transmitter must be configured to enable remote control activation.

Please be aware this app is not a Lectrosonics product. It is privately owned and operated by New Endian LLC, www.newendian.com.

User Interface

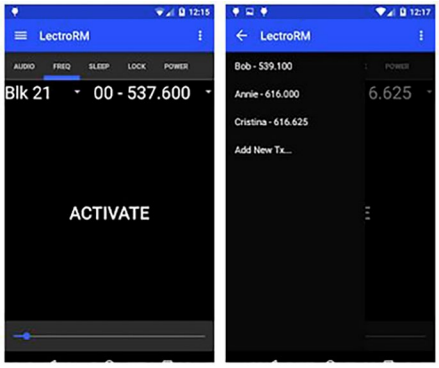
The user interface involves selecting the audio sequence related to the desired change. Each version has an interface for selecting the desired setting and the desired option for that setting. Each version also has a mechanism to prevent accidental activation of the tone.

iOS



The iPhone version keeps each available setting on a separate page with the list of options for that setting. On iOS, the "Activate" toggle switch must be enabled to show the button which will then activate the audio. The iOS version's default orientation is upside-down but can be configured to orient right-side up. The purpose for this is to orient the device's speaker, which is at the bottom of the device, closer to the transmitter microphone.

Android



The Android version keeps all settings on the same page and allows the user to toggle between the activation buttons for each setting. The activation button must be long pressed to activate. The Android version also allows users to keep a configurable list of full sets of settings.

Frequency Tuning Range

RF-intense multichannel and mobile venues must have a broad selection of frequencies available to alleviate interference problems, especially with the emergence of DTV telecasts. Frequencies are selectable in 25 or 100 kHz steps across the tuning range of each frequency block. Six different blocks are available.

Battery Compartment

AA (Lithium recommended) battery technology has advanced significantly in recent years, with a variety of high capacity dry cell and rechargeable formats. SM Series transmitters and the RM remote module are designed to take advantage of this new technology and provide extended operating times at high RF power.

The battery door rotates to open and close on the SMQV & SMV transmitters. A knurled knob is tightened to maintain pressure on the battery contacts.

Specifications

Operating frequencies:

Block 470	470.100 - 495.675	Block 21	537.600 - 563.175
Block 19	486.400 - 511.975	Block 22	563.200 - 588.775
Block 20	512.000 - 537.575	Block 23a	588.800 - 607.950

Channel Spacing: Selectable; 25 or 100 kHz

Frequency selection: Control panel mounted membrane switches

RF Power output: Selectable; 50, 100 or 250 mW

Compatibility Modes: Nu Hybrid, Mode 3, IFB

Pilot tone: 3.5 kHz deviation (Nu Hybrid)

Frequency stability: ± 0.002%

Spurious radiation: Compliant with ETSI EN 300 422-1 v1.4.2

Equivalent input noise: –125 dBV, A-weighted

Input level:

If set for dynamic mic: 0.5 mV to 50 mV before limiting. Greater than 1 V with limiting.

If set for electret lavaliere mic: 1.7 uA to 170 uA before limiting. Greater than 5000 uA (5 mA) with limiting.

Line level input: 17 mV to 1.7 V before limiting. Greater than 50 V with limiting.

Input impedance:

Dynamic mic: 300 Ohms

Electret lavaliere: Input is virtual ground with servo adjusted constant current bias

Line level: 2.7 k Ohms

Input limiter: Soft limiter, 30 dB range

Bias voltages: Fixed 5 V at up to 5 mA; Selectable 2 V or 4 V servo bias for any electret lavaliere.

Gain control range: 44 dB; panel mounted membrane switches

Modulation indicators: Dual bicolor LEDs indicate modulation of –20, -10, 0, +10 dB referenced to full modulation.

Controls: Control panel with LCD and four membrane switches.

Low frequency roll-off: Adjustable from 35 to 150 Hz.

Audio Frequency Response: 35 Hz to 20 kHz, +/-1 dB *(The low frequency roll-off is adjustable - see graph on page 2)*

Signal to Noise Ratio (dB): (overall system, Nu Hybrid mode)

SmartNR	No Limiting	w/Limiting
OFF	103.5	108.0
NORMAL	107.0	111.5
FULL	108.5	113.0

(Note: the dual envelope "soft" limiter provides exceptionally good handling of transients using variable attack and release time constants. The gradual onset of limiting in the design begins below full modulation, which reduces the measured figure for *SNR without limiting* by 4.5 dB)

Total Harmonic Distortion: 0.2% typical (Nu Hybrid mode)

Audio Input Jack: Switchcraft 5-pin locking (TA5F)

Antenna: Flexible, unbreakable, detachable steel cable.

Batteries: 1.5 Volt AA (Lithium recommended)

Unit/Power	Battery Life
SMV 50 mW (1 AA):	7.25 hrs
SMV 100 mW (1 AA):	5.5 hrs
SMV 250 mW (1 AA):	3 hrs
SMQV 50 mW (2 AA):	14.5 hrs
SMQV 100 mW (2 AA):	14 hrs
SMQV 250 mW (2 AA):	7.5 hrs

Weight with Battery: SMV: 2.7 oz. (75.9 grams)
SMQV: 3.7 oz. (105 grams)

Overall Dimensions: SMV: 2.3 x 1.8 x 0.64 inches
58 x 46 x 16 mm
SMQV: 2.3 x 2.4 x 0.64 inches
58 x 60 x 16 mm

Emission Designator: 110KF3E

Specifications subject to change without notice.

LECTROSONICS®
581 Laser Road NE • Rio Rancho, NM 87124 USA • www.lectrosonics.com
+1(505) 892-4501 • fax +1(505) 892-6243 • (800) 821-1121 US and Canada • sales@lectrosonics.com

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