# Quick Start Guide

**LECTROSONICS®**

## SMV-941 Series Transmitters

**Digital Hybrid Wireless® US Patent 7,225,135**

For FCC Part 74 licensed operators
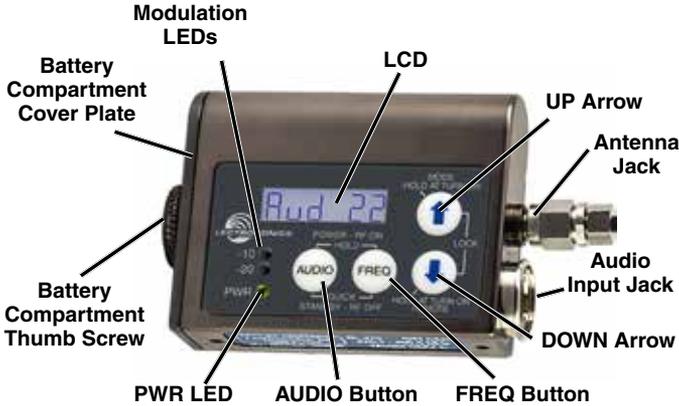
**SMV-941**  **SMQV-941**

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This guide is intended to assist with initial setup and operation of your Lectrosonics product.

For a detailed user manual, download the most current version at:

**www.lectrosonics.com**

30 November 2018

# Controls and Functions



Modulation LEDs

Battery Compartment Cover Plate

LCD

UP Arrow

Antenna Jack

Audio Input Jack

Battery Compartment Thumb Screw

DOWN Arrow

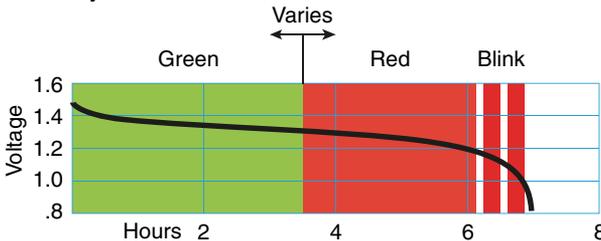PWR LED

AUDIO Button

FREQ Button

## LCD Screen

The LCD is a numeric-type Liquid Crystal Display with screens for adjusting power, frequency, audio level and low frequency audio roll-off. The transmitter can be powered up with or without the RF output turned on. A countdown appears in the LCD when powering on and off, allowing the transmitter to be turned on without RF for adjustments, and to prevent accidentally turning it off with momentary button presses.

## Power LED

The PWR LED glows green when the battery is good. The color changes to red at a midpoint of the runtime as the battery voltage drops. When the LED begins to blink red, there is usually less than 30 minutes remaining with a lithium battery.

The exact point at which the LED turns red will vary with battery brand and condition, temperature, and the output power setting. The LED is intended to simply catch your attention, not to be an exact indicator of remaining time. The illustration below depicts typical behavior with a lithium battery in the single battery model at 50 mW.



A weak battery will sometimes cause the PWR LED to glow green immediately after the transmitter is turned on, but will soon discharge to the point where the LED will turn red or the unit will turn off completely.

**LECTROSONICS, INC.**

## Power LED Off Feature

In normal operating mode, the UP and DOWN arrow buttons may be used to turn the PWR LED indicators off and on. This setting does not persist through a power cycle nor does it affect the LCD backlight.

## Audio Input Jack

The Servo Bias input circuitry accommodates virtually every lavaliere, hand-held or shotgun microphone available, plus line level signals.

## Battery Compartment and Thumb Screw

The large knurled thumbscrew is used to release or secure the Battery Compartment Cover Plate.

## Modulation LEDs

Proper input gain adjustment is critical to ensure the best audio quality. Two bicolor LEDs will glow either red or green to accurately indicate modulation levels. The input circuitry includes a wide range DSP controlled limiter to prevent distortion at high input levels.

It is important to set the gain (audio level) high enough to achieve full modulation during louder peaks in the audio. The limiter can handle over 30 dB of level above full modulation, so with an optimum setting, the LEDs will flash red during use. If the LEDs never flash red, the gain is too low. In the table below, +0 dB indicates full modulation (-20 LED just turns red).

| Signal Level | -20 LED | -10 LED |
|---|---|---|
| Less than -20 dB | ● Off | ● Off |
| -20 dB to -10 dB | 🟢 Green | ● Off |
| -10 dB to +0 dB | 🟢 Green | 🟢 Green |
| +0 dB to +10 dB | 🔴 Red | 🟢 Green |
| Greater than +10 db | 🔴 Red | 🔴 Red |

## AUDIO and FREQ Buttons

The AUDIO button is used to display the audio level and low frequency roll-off settings. The UP and DOWN arrow buttons adjust the values.

The FREQ Button displays the selected operating frequency and toggles the LCD between displaying the actual operating frequency in MHz and a two-digit hexadecimal number that corresponds to the equivalent frequency switch setting on legacy transmitters.

Pressing both buttons simultaneously enters the standby mode and turns the unit on and off

## UP/DOWN Arrow Buttons

The UP and DOWN arrow buttons are used to select the values on the various setup screens and to lock out the control panel.

## Antenna

The transmitter uses a whip antenna with a flexible woven, galvanized steel mesh cable and a standard SMA connector.
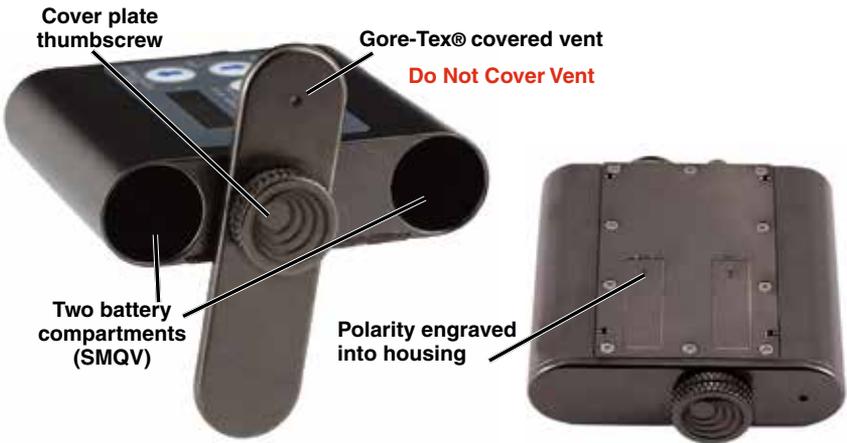
# Battery and Battery Eliminator Installation

Note: Standard zinc-carbon batteries marked **"heavy-duty"** or **"long-lasting"** are not adequate.

The battery status circuitry is designed for the voltage drop over the life of lithium batteries.

To install new batteries:

1. Turn the battery cover plate thumbscrew counterclockwise a few turns until the door will rotate.

2. Insert the new batteries into the housing. Polarity is marked on the back of the housing.

3. Align the battery cover plate and tighten the battery cover plate thumbscrew.



**Cover plate thumbscrew**

**Gore-Tex® covered vent**

**Do Not Cover Vent**

**Two battery compartments (SMQV)**

**Polarity engraved into housing**

To install the battery eliminator, loosen the thumbscrew completely and remove the battery door. Insert the battery eliminator and tighten the thumbscrew.



**Install plastic cap on dual battery model to cover the open battery compartment.**

## Attaching and Removing the Microphone

The flexible sleeve over the 5-pin plug on the microphone helps prevent dust and moisture from getting into the input jack, and provides additional strain relief. The flange around the rim of the connector on the transmitter creates a splash proof connection and keeps the sleeve securely attached.

The following procedure simplifies the attachment and removal of the microphone to assure the sleeve is seated securely.

Align the latch on the plug and jack and insert the connector. It is easier to attach the microphone when the sleeve is pulled back as shown in the Step 3 photo below.



If the sleeve is pulled down and covering the connector, squeeze the end of the sleeve so you can feel the connector inside and press it into the jack until it latches.



Pinch and squeeze the sleeve on this end to work it down over the flange.

Pinch and squeeze the sleeve near the flange and work it down with a kneading motion over the flange all the way around until it stays in place flush with the housing. Pull on the connector to make sure it is firmly latched.



Release button

To remove the connector, pull the sleeve back to expose the black release button. Press the button to unlatch the plug.

# Operating Instructions

## Power Up and Boot Sequence

1) Ensure that good batteries are installed in the unit.

2) Simultaneously press and hold the AUDIO and FREQ buttons until the power on boot sequence is initiated.

The count will progress from 1 through 3 and the unit will then power up with the RF output turned on. During this turn on sequence, the modulation and power LEDs all glow red, then green, and then revert to normal operation. If the buttons are released before the count is complete, the unit will boot up into the standby mode (see below).

The LCD displays the following information during the boot sequence:

| Company Name: | **LECtro** |
|---|---|
| Frequency Block and Firmware Version (rX.X): | **941r1.1** (typical) |
| Compatibility Mode: | **CP nHb** (typical) |
| Power Level | **Pr 100** (as set) |
| Audio: | **Aud 22** (as set) |

## Power Down

**Initial Power Off Timer Screen**

1) Simultaneously press and hold the AUDIO and FREQ buttons while observing that the word "Off" appears in the LCD along with a counter.

2) When the counter reaches "0", the unit turns off.

Note: If the AUDIO and FREQ buttons are released before the LCD goes blank at the end of the countdown, the unit will not turn off. Instead, it will stay energized and the display will return to the previous screen.

## Standby Mode
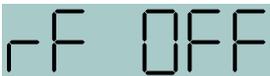
**Standby Screen**

With the power turned off, pressing the AUDIO and FREQ buttons briefly places the unit in Standby Mode.

In this mode the RF output is turned off so all setup adjustments can be made without interfering with other systems operating in the same location. The screen displays "rf OFF" to remind the user that the unit is not transmitting.

While the unit is in the standby mode, access the setup screens using the AUDIO and FREQ buttons and make adjustments using the UP and DOWN arrows.

## Menus

Setup is accomplished using menus and setup screens accessed by holding the UP and DOWN arrow buttons at turn on, and by pressing the AUDIO and FREQ buttons when the unit is turned on.

## Hold UP arrow at turn on.

Hold the UP arrow button in while pressing both AUDIO and FREQ buttons to access the setup screens below. It's easier if you lay the unit on a flat surface and use two hands to press all three buttons at the same time. After the first screen loads, press the AUDIO button repeatedly to switch between the settings. Press the UP and DOWN arrow buttons for the desired selection.

After the settings are made, press both AUDIO and FREQ buttons together to exit and turn the power off.

### CP (compatibility modes)

Allows the transmitter to be used with 941 Series receivers or IFB systems in the 941 MHz band.

| nHb | new hybrid mode (ETSI compliant) |
|------|----------------------------------|
| IFb | Lectrosonics IFB systems |

NOTE: The nHb compatibility mode is the same as the NU HYBR mode in the SRc-941 receiver.

### Pr (power output)

Can be set at 100 for slightly increased range or at 50 for longer battery life.

| 50 | 50 mW output and longer battery life when maximum range is not necessary |
|------|----------------------------------------------------------|
| 100 | 100 mW for slightly increased range |

NOTE: See battery life table in the specifications

### bL (backlight settings)

Adjusts how long the LCD stays lit after pressing buttons.

| 5 | 5 minutes |
|------|-------------|
| 30 | 30 seconds |
| on | Stays on |

### StP (Frequency step size)

Sets the increments of frequency adjustment.

| 100 | 100 kHz steps |
|------|----------------|
| 25 | 25 kHz steps |

## Hold DOWN arrow at turn on.

Hold the DOWN arrow button in while pressing both AUDIO and FREQ buttons to access the setup screens below. It's easier if you lay the unit on a flat surface and use two hands to press all three buttons at the same time. After the first screen loads, press the AUDIO button repeatedly to switch between the settings. Press the UP and DOWN arrow buttons for the desired selection.

After the settings are made, press both AUDIO and FREQ buttons together to exit and turn the power off.

### rc (remote control with mobile app)

Allows the transmitter to respond to remote control "dweedle" tones from a mobile device, or from tones generated by the Lectrosonics RM and RM2 devices.

| on | Enables the remote function. |
|-----|------------------------------|
| oFF | Disables the remote function. |

NOTE: See page 10 for details

### PbAc (auto power restore)

Sets the transmitter to automatically turn back on and return to the previous state after a battery change or power interruption when it is in the operating mode. This is convenient when the transmitter is powered by an external source.

| 1 | Restores power automatically |
|---|------------------------------|
| 0 | Does not restore power automatically |

## AUDIO Button

When the unit is turned on in either the Standby or Operating Mode, pressing the AUDIO button repeatedly switches between the available settings.

- **LF (XX)** adjusts the low frequency roll-off of the audio signal.
- **AUD (XX)** adjusts the input gain

### LF (XX) - Adjusting the Low Frequency Roll-off

Repeatedly press the AUDIO button until the LF roll-off adjustment screen appears. Then press and hold the AUDIO button while selecting the desired roll-off frequency with the UP and DOWN arrows.

$$LF \quad 35 \qquad LF \quad 150$$

The roll-off frequency can be set to 35, 50, 70, 100, 120 and 150 Hz.

## AUD (XX) - Adjusting Audio Level (Gain)

The control panel modulation LEDs marked -10 and -20 indicate the audio level and limiter activity. Once adjusted according to the following procedure, the transmitter's audio level setting **should not** be used to control the volume of your sound system or recorder levels. This gain adjustment matches the transmitter gain with the microphone's output level, the user's voice level and the position of the microphone. The audio input level (gain) should be adjusted with the unit in the Standby Mode while observing the LEDs.

It is generally best to set the LF roll-off before adjusting the gain, since low frequency energy can affect the input level to the transmitter.

It is desirable to to set the gain so that some limiting occurs on louder peaks. The limiter is very transparent over a 43 dB range, and its effect is not audible until the system is close to overload. In other words, don't be shy about turning up the gain.

It is actually a good idea to turn the gain up to maximum and listen for distortion or compression to get a feel for how much headroom is available.

| Signal Level | -20 LED | -10 LED |
|---|---|---|
| Less than -20 dB | ⚫ Off | ⚫ Off |
| -20 dB to -10 dB | 🟢 Green | ⚫ Off |
| -10 dB to +0 dB | 🟢 Green | 🟢 Green |
| +0 dB to +10 dB | 🔴 Red | 🟢 Green |
| Greater than +10 dB | 🔴 Red | 🔴 Red |

Note: If several different people will be using the transmitter and there is not time to make the adjustment for each individual, adjust it for the loudest voice.

1) With the transmitter in the Standby Mode, plug in the microphone and make sure the connector is firmly seated.

*Warning: If the wireless system is powered up while connected to a live sound system, be careful to turn the sound system level down first or severe feedback can occur.*

2) Position the microphone in the location where it will be used in actual operation.

3) Observe the modulation LEDs while speaking or singing into the microphone at the same voice level that will be used during operation. While holding the AUDIO button, press the UP or DOWN arrow buttons until the both the -20 and -10 LEDs glow green, with the -20 LED flickering red during louder peaks in the audio. This will maximize the signal to noise ratio of the system with full modulation.

4) If the unit was set up in Standby Mode, it will be necessary to turn the transmitter off, then power it up again in normal operation so the RF output will be on. Then the other components in the sound or recording system can be adjusted.

## FREQ Button

The operating frequency can be adjusted according to the frequency in MHz or a two-digit hexadecimal code. Press the button repeatedly to switch between the two displays. The display switches when the button is first pushed; push and hold the button in the desired mode and use the UP and DOWN arrow buttons to make the adjustment.

In this example, the same frequency is displayed in MHz and the equivalent hex code.

948.200 CH43
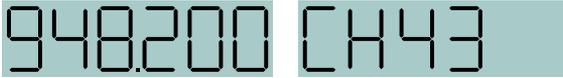
The hex code is a hexadecimal sequence that progresses upward from lowest to highest frequency using the numerals and letters from 0 through F. When the frequency is on a 100 kHz step, the hex code is only two digits, as shown above, which is easy to remember. When the step size is set to 25 kHz, additional characters are used to denote the exact frequency with four characters.

948.225 CH43.25
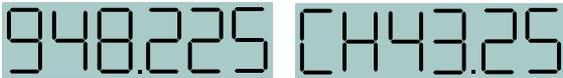
## Locking/Unlocking the Control Panel

Loc

unLoc l

Simultaneously pressing and holding both the UP and DOWN arrow buttons during normal operation starts the Lock timer. The timer starts at three and counts down to zero.

When the timer reaches zero, the buttons on the control panel are locked.

With the controls locked, the AUDIO and FREQ buttons can still be used to display current settings. Any attempt to change a setting by pressing either the UP or DOWN arrow button will result in an on-screen *Loc* reminder that the controls are locked. Remove the batteries to unlock the control panel.

*Important: Once the transmitter is locked, it cannot be unlocked or powered off using the buttons. The only ways to unlock a locked transmitter are to remove the battery or unlock it via the RM remote control.*

# Remote Control Operation

**rc on**

**rc oFF**

The transmitter can be controlled by signals from audio "dweedle" tones generated by a mobile phone, or with the Lectrosonics RM and RM2 devices.

The remote function is enabled in the UP arrow power on options (see previous section). If a remote control signal is detected but the function is no enabled, the message **rc oFF** will be displayed briefly on the transmitter's LCD.

Remote functions available are:

- Tx Input Gain
- Sleep/Unsleep
- Lock/Unlock
- Frequency
- Tuning in 25 kHz steps
- Changing the low frequency roll-off setting
- Turning on/off the PWR and Audio LEDs
- Input gain functions

In sleep mode, the transmitter uses about 20% of the normal amount of battery drain. Sleep mode can only be invoked with the remote control, and can only be revoked with the remote control or by removing the battery. When in the sleep mode, the PWR LED blinks green every few seconds to indicate that the transmitter is asleep and not turned off.

# LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liablility of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

**LECTROSONICS**®

**Made in the USA by a Bunch of Fanatics**

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