Quick Start Guide

HMa-941

Plug-On Transmitter

Digital Hybrid Wireless®
U.S. Patent 7,225,135

For FCC Part 74 licensed operators

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Serial Number:

Purchase Date:

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/manuals

28 March 2019

Controls and Functions

LCD Screen

Backlit for easy viewing in bright or dimly lit conditions.

Pwr (power) LED

Indicates power status and battery strength.

XLR Input Jack

Standard 3-pin Switchcraft XLR type. Coupler is spring-loaded to maintain a snug fit and to prevent noise.

Modulation LEDs

Provides a visual indication of the audio input signal level - either red or green to indicate modulation levels.

AUDIO Button

Adjust the audio gain setting (0 dB to 44 dB).

FREQ Button

Used to set the operating frequency and toggle the LCD between the operating frequency in MHz and a two-digit hexadecimal frequency code.

UP/DOWN Arrows

Used to view and select parameters and values during setup and operation.

Battery Compartment Cover

Hinged to housing to prevent loss of cover.

USB Port

USB Port for firmware updates in the field.

IR Port

IR (infrared) port for fast setup.

Battery Installation

The transmitter is powered by two AA batteries.

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

To install new batteries:

1. Slide open the Battery Cover and remove any old batteries.
2. Insert the new batteries into the housing. One battery goes in positive (+) end first, the other negative (-) end first. Look into the battery compartment to determine which end goes in which side. The side with the plastic ring is the side which accepts the positive end of the battery.

Note: It is possible to install the batteries backward and close the battery door, but the batteries will not make contact and the unit will not work.

3. Slide the Battery Cover until it snaps securely shut.

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:	**b 941**
Firmware Version (rX.X):	**r1.01** (typical)
Compatibility Mode:	**CP Hbr** (typical)

When the boot sequence is complete, the display will switch to the frequency currently 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	Digital hybrid mode
IFb	Lectrosonics IFB systems

Pr (power output)
Can be set at 250 for extended range or at 50 for longer battery life.

50	50 mW output and longer battery life when maximum range is not necessary
1**00**	100 mW for slightly increased range

NOTE: See battery life table in the specifications

AP (audio polarity)

The polarity of the audio input (sometimes referred to as "phase") can be reversed for compatibility with other microphones.

P	Denotes positive polarity
n	Denotes negative polarity

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.

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.

1	Restores power automatically
0	Does not restore power automatically

bL (backlight settings)

Adjusts how long the LCD stays lit after pressing buttons.

5	5 minutes
30	30 seconds
on	Stays on

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.

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

AUD (XX) - Adjusting Audio Level (Gain)

It's generally a good idea to adjust the low frequency roll-off before setting the gain, since it could affect the gain adjustment. 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.

PH (phantom power supply)

The transmitter input jack can provide phantom power for the attached microphone if needed, with voltages at 5, 15 or 48 or be turned off. Use the UP and DOWN arrow buttons to select the desired setting. Phantom power will consume a slight amount of battery power.

About the Phantom Power Supply

Three phantom voltages are selectable from the control panel.
The voltages are:

- ***5 Volts*** for lavaliere microphones,
- ***15 Volts*** for some professional mics requiring high current and for many common stage mics that will operate over a wide phantom Voltage range of 12 to 48 Volts. With the proper adapter, this position can also be used with T power microphones. See our web site for details on finding or making the proper adapter.
- ***48 Volts*** for microphones that do in fact require a supply greater than 18 Volts. (See below for a discussion of why 42 and not a “true” 48 Volts.)

For longest battery life use the minimum phantom voltage necessary for the microphone. Many stage microphones regulate the 48 Volts down to 10 Volts internally anyway, so you might as well use the 15 Volt setting and save some battery power. If you are not using a microphone for the input device, or are using a microphone that does not require phantom power, turn the phantom power off.

Phantom power should only be used with a fully floating, balanced device such as most microphones with a 3-pin XLR connector. If you use the phantom power with an unbalanced device or if pins 2 or 3 are DC connected to ground, then you will draw maximum current from the power supply. The HM is fully protected against such shorts but the batteries will be drained at twice the normal rate.

The transmitter can supply 4 mA at 42 Volts, 8 mA at 15 Volts, and 8 mA at 5 Volts. The 42 Volts setting actually supplies the same voltage to a 48 Volt microphone as the DIN standard arrangement due to a dynamic biasing scheme that does not have as much voltage drop as the DIN standard. The 48 Volt DIN standard arrangement protects against shorts and high fault current with high resistance in the power supply feeds to pins 2 and 3. This provides protection if the supply current is accidentally shorted to ground and also keeps the microphone from being attenuated by the power supply.

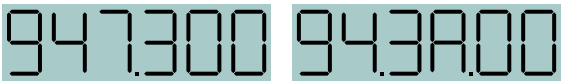
The HMa improves on those functions and is able to use less power from the battery by using constant current sources and current limiters. With this dynamic arrangement the HMa can also supply more than twice the current of competing 48 Volt plug on units and provide four times the current for some very high end 15 Volt microphones.

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.

Hex code numbering came about years ago when the first synthesized wireless equipment was introduced. Two 16-position rotary switches were used to set the frequency. 16 on one switch and 16 on the other switch yielded 256 frequencies (16x16=256). While there are no 941 band models that use these switches, hex code numbering is easier way to remember than frequencies expressed in MHz with six numerals.

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



The hex code is a hexadecimal numbering 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 will display two **00**'s for the last two digits, which is easy to remember (3A in the example above). When the step size is set to 25 kHz, the last two digits will be 00, 25, 50 or 75 (3A.25 in the example below), which is still easier to remember than all six numerals of the frequency in MHz.

Locking/Unlocking the Control Panel

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 reminder (***Loc***) 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 remote control.

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.

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