Quick Start Guide

LECTROSONICS®

Digital Hybrid Wireless®
Watertight Belt-Pack Transmitter

WM, WM/E01, WM/E02, WM/X

C E

Follow Us On:

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

Fill in for your records:

Serial Number:

Purchase Date:

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

For a complete instruction manual, visit and download at:

www.lectrosonics.com/manuals

9 October 2019

Controls and Functions

Audio Input Jack · **Modulation LEDs** · **LCD** · **UP Arrow** · **Battery Compartment Caps** · **DOWN Arrow** · **FREQ Button** · **AUDIO Button** · **PWR LED**

LCD Screen

The display is a highly visible, backlit LCD with screens for making all setup and level adjustments. The transmitter can be powered up with or without the RF output turned on. With the RF output turned off, all adjustments can be made without creating interference for other wireless systems in the vicinity.

For normal powering up and down, a countdown appears in the LCD. The buttons must pressed in for the duration of the countdown, which helps to prevent accidentally turning the transmitter on or off.

Power LED

The PWR LED glows green when the battery is good. The color changes to red when there is about 30 minutes of operation left with the recommended lithium battery. An alkaline battery will have about 20 minutes of life left. When the LED begins to blink red, there are only a few minutes of life.

Note: A NiMH rechargeable battery will give little or no warning when it is depleted. If you wish to use NiMH batteries, we recommend trying fully charged batteries in the unit and using the battery timer feature available in most receivers to determine the available operating time.

A weak battery will sometimes cause the PWR LED to glow green immediately after the unit is turned on, but will soon discharge to the point where the LED will turn red or the unit will turn off completely. When the transmitter is in SLEEP mode, the LED blinks green every few seconds.

Audio Input Jack

This is a threaded locking connector that accepts the Lectrosonics watertight WP connector.

Battery Compartments and Thumb Screws

The large knurled thumbscrews retain the batteries and maintain solid battery contact. The lanyard keeps the battery caps attached, but it can be removed if desired using a 1/16 inch hex key (Allen wrench).

Modulation LEDs

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

It is important to set the gain (audio level) high enough to achieve full modulation during louder peaks in the audio. The DSP-controlled limiter can handle peaks over 30 dB above full modulation. Full modulation is indicated when the -20 LED first turns red. With an optimum setting, the -20 LED will flicker red during operation. If the LEDs never flash red, the gain is too low.

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 Button

The AUDIO button is used to display the gain and low frequency roll-off settings. The UP and DOWN arrows adjust the values. This button is also used with the FREQ button to enter standby mode and to power the transmitter on or off.

FREQ Button

The FREQ button displays the selected operating frequency and also toggles the LCD between displaying the actual operating frequency in MHz and a two-digit hexadecimal number that corresponds to the equivalent Lectrosonics Frequency Switch Setting. This button is also used with the AUDIO button to enter standby mode and to power the transmitter on or off.

Up/Down Arrows

The Up and Down arrow buttons are used to select the values on the various setup screens and to lock out the control panel. Pressing both arrows simultaneously enters the lock countdown. When an attempt is made to change a setting while the control panel is locked, a message will flash on the LCD as a reminder that the unit is locked. Once locked, the buttons can only be unlocked by removing the batteries, or with the RM remote control.

Antenna
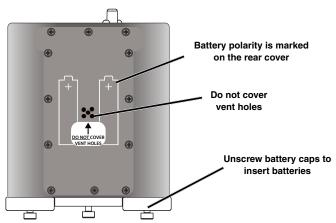
The fixed whip antenna is made of a flexible, woven, galvanized steel mesh cable.

Battery Compartments

The battery compartments are a rugged, straightforward design with a recessed entry that captures the O-ring on the cap. The spring contact on the cap maintains solid contact on the battery regardless of its exact length.

The O-rings should be kept clean and dry, and coated with petroleum jelly on a regular basis. See page 11 of the manual online for more information on preventing corrosion.

Battery polarity is marked on the rear cover

Do not cover vent holes

DO NOT COVER VENT HOLES

Unscrew battery caps to insert batteries

Attaching and Removing the Microphone

The threaded WP watertight plug on the microphone cable fits into a recessed jack on the top panel. The recess in the opening retains the O-ring when the plug is tightened. The Lectrosonics M152WP lavaliere microphone is supplied with the WP plug already installed. Other microphones can also be terminated with this plug by following the instructions included with the WP connector kits.

Treat O-ring with petroleum jelly before connecting

Operating Instructions

Power Up and Boot Sequence

Simultaneously press and hold the AUDIO and FREQ buttons until the startup count is completed. The screen will display a count from 1 to 3 as the unit boots up, then it switches to the Audio screen. As the unit turns on, the Modulation LEDs and PWR LED all glow red, then green, and then revert to normal operation.

`On . .3`   `Aud 20`

The LCD displays a boot sequence which consists of four screens ending with the audio screen similar to this example:

- Company name: Lectro
- Frequency block/
  Firmware Ver.:   b25r2.4
- Power level: Pr 100
- Compatibility mode: CP 400
- Audio (Input gain):   Aud 22

Power Down

`OFF. . .1`   Press and hold the AUDIO and FREQ buttons while observing that the word "OFF" appears in the LCD. The screen will display a countdown from 3 to 1 and the unit will then turn off.

Note: If the AUDIO and FREQ buttons are released before the LCD goes blank at the end of the countdown, the unit will stay energized and the display will return to the previous screen.

Standby Mode

`rF  OFF`   With the transmitter off, quickly press both AUDIO and FREQ buttons and release (before counter reaches "0") to enter the "standby" mode. In this mode the RF output is turned off so adjustments can be made without interfering with other systems operating in the same location. The LCD displays *rf OFF* to remind you that the unit is not transmitting.

Use the AUDIO and FREQ buttons to access the various setup screens. When the adjustments are complete, press the AUDIO and FREQ buttons together to save the settings and turn the unit off.

Lock/Unlock the Keypad

The control panel buttons can be locked out to avoid inadvertent changes in the settings or turning the unit off unintentionally. Simultaneously pressing and holding both the UP and DOWN arrow buttons during normal operation starts a countdown timer.

`unLoc 1`

The timer starts at three and counts down to zero. When the timer reaches zero, the transmitter's controls 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.

`Loc`

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 batteries or unlock it via the RM remote control.

UP Arrow Settings

With the unit turned off, hold the UP arrow button and simultaneously press the AUDIO and FREQ buttons. Each successive press of the AUDIO button will step through the setup screens.

- **Compatibility Mode**
- **Input Type**
- **RF Power Output**
- **LCD Backlight**
- **Frequency Step Size**

Use the UP and DOWN arrow buttons to scroll through the options. The selected options will automatically be stored when the power is turned off. Press both the AUDIO and FREQ buttons to exit the menu and turn the power off.

Note: The unit is automatically set to "standby" in this setup mode; with *rF OFF* not displayed.

Compatibility Mode

- **CP 400:**   400 Series (Digital Hybrid) mode
- **CP IFb:**   IFB Series mode
- **CP 6:**   Mode 6 (contact the factory for details)
- **CP 100:**   100 Series mode
- **CP 200:**   200 Series mode
- **CP 3:**   Mode 3 (contact the factory for details)

NOTE: If your Lectrosonics receiver does not have Nu Hybrid mode, set the receiver to Euro Digital Hybrid Wireless® (EU Dig. Hybrid).

Input Type

- **LInE:**   Bias turned off; line level impedance
- **PH oFF:**   Bias turned off for dynamic mics
- **PH 2:**   Bias at 2 volts for electret mics
- **PH 4:**   Bias at 4 volts for electret mics

The correct bias is specified by the microphone manufacturer. 4 volts is typical for most electret lavaliere microphones. 2 volts is preferred by some mic manufacturers such as Countryman for the very small B6 and E6 models.

RF Power Output

- **Pr 50**   50 mW for maximum battery life
- **Pr 100**   100 mW is an intermediate setting
- **Pr 250**   250 mW for maximum operating range

NOTE: 10 mW is the only option for E02.

LCD Backlight

- **bl 5**   Stay on for five minutes
- **bl 30**   Stay on for 30 seconds
- **bl on**   Stay on continuously

Frequency Step Size

This menu item allows frequencies to be selected in either 25 kHz or 100 kHz increments. If the desired frequency ends in .025, .050 or .075 MHz, the 25 kHz step size must be selected.

- **Stp 100**   Frequency steps in 100kHz increments
- **Stp 25**   Frequency steps in 25 kHz increments

DOWN Arrow Settings

Hold the DOWN arrow button and simultaneously press the AUDIO and FREQ buttons. Each successive press of the AUDIO button will step through the setup screens.

- **Remote Control**
- **Auto Power Restore**
- **Audio Mute**

Use the UP and DOWN arrow buttons to scroll through the options. The selected options will automatically be stored when the power is turned off. Press both the AUDIO and FREQ buttons to exit the menu and turn the power off.

Remote Control

Transmitter settings can be configured using special tones generated by a smartphone using a remote control application such as Lectro RM (available on the AppStore or Google Play). Enable this feature on the transmitter with the following menu items:

•rc on Enables the remote function
•rc oFF Disables the remote function

If a remote control signal is detected but the function is turned off, the message rc oFF will be displayed briefly on the transmitter's LCD to confirm that a valid signal was received, but that the transmitter is not configured to respond to it.

Auto Power Restore

This setting determines how the transmitter is powered up again after the batteries have become exhausted in normal operation.

When this function is turned on, the unit will power up to normal operation with a brief press of the AUDIO and FREQ buttons after the batteries have been replaced.

When this function is turned off, the AUDIO and FREQ buttons need to be held in for the completion of the count to turn the unit back on for normal operation.

This is a unique behavior that takes place only when the batteries fail during operation. If the unit is turned off manually, a quick press of the buttons will turn it on in the "standby" mode instead.

The firmware is written this way because the battery caps make contact with the battery before the cap is seated, and the fact that there are two separate battery caps to tighten. This allows both batteries to be installed and the caps tightened before power is restored. It also makes turning the unit back on easier when wearing gloves since the buttons do not need to be held in.

•PbAc 1 Turns power restore ON
•PbAc 0 Turns power restore OFF

Audio Mute

Beginning with firmware v2.6 on the US version, the AUDIO button can be configured to work as a mute button by turning this setting on. A quick press of the AUDIO button will then mute the audio and a message will appear on the LCD confirming that the audio is muted. Another quick press turns the audio back on.

•At on Enables the audio mute function
•At oFF Disables the audio mute function

During operation, the LCD will continuously display the state of audio muting as a reminder, showing the audio as ON or OFF.

The AUDIO button will still work to set Input Gain by pressing and holding it in for a few seconds, however, if the audio is muted, no sound will be heard during the adjustment.

If the transmitter is in "standby," the Low Frequency Roll-off can be adjusted whether or not the audio mute function is enabled. When the audio mute function is enabled and the unit is turned on and transmitting, **only the audio level (input gain) can be adjusted** by holding the AUDIO button in for a few seconds.

AUDIO Button Settings

Low Frequency Roll-off

`LF    35`

It is possible that the low frequency roll-off point could affect the gain setting, so it's generally good practice to make this adjustment before adjusting the input gain. Press and hold the AUDIO button with **LF (XX)** on the screen while selecting the desired roll-off frequency with the UP and DOWN arrows.

- LF 35   35 Hz
- LF 50   50 Hz
- LF 70   70 Hz
- LF 100   100 Hz
- LF 120   120 Hz
- LF 150   150 Hz

The roll-off is often adjusted by ear while monitoring the audio.

Input Gain

`Aud  20`

The audio input level (input gain) can be adjusted with the unit in the "standby" mode or while powered up in normal operation. The modulation LEDs on the control panel indicate the audio level and limiter activity. The maximum signal to noise ratio is achieved at full modulation, when the -20 LED first turns red. This gain adjustment matches the transmitter gain with the microphone's output level, the user's voice level and the position of the microphone. This gain setting should not be used to control the volume of your sound system or recorder levels.

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: Different voices will usually require different gain settings, so check this adjustment as each new person uses the system. 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.

Warning: If the wireless system is connected to a live sound system, turn the sound system level down first to avoid severe feedback.

1) Position the microphone in the location where it will be used in actual operation.
2) Place the transmitter in the "standby" mode or turn it on for normal use.
3) While speaking or singing into the microphone at the same voice level that will be used, observe the LEDs on the control panel. Hold the AUDIO button and press the UP or DOWN arrow buttons to adjust the gain until the -20 LED flickers red on louder peaks. This LED turns red at the instant full modulation takes place and the very onset of limiting. The red color does not indicate overload or clipping.

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 Settings

The frequency can be displayed either in MHz or as a two-digit hexadecimal number and it can be set when the unit is in "standby" or when the transmitter is powered up in the normal operating mode.

MHz **Hex Code**

`502.600`   `CH    A2`

The hexadecimal numbering system is unique to Lectrosonics where two alphanumeric characters correspond to the left and right switch settings on earlier analog transmitters that had mechanical rotary switches to adjust frequency.

- Press the FREQ button repeatedly to toggle between either the MHz screen or the Hex Code screen.
- While holding the FREQ button, use the UP or DOWN arrow buttons to move the operating frequency up or down from the current setting.

The two-digit hex code is easier to remember, which can be handy when setting up a multi-channel system.

Preventing Corrosion

Whenever the transmitter has been exposed to moisture or perspiration, follow the instructions below to minimize the risk of corrosion.

IMPORTANT: Dry the unit before removing the microphone connector and/or battery caps

If the transmitter has been exposed to salt water, rinse it with fresh water and then dry the exterior of the transmitter thoroughly with a clean paper towel or cloth. Remove all moisture around the battery caps and microphone cable connector.

After removing the battery caps and microphone connector, wipe off any residual moisture around the battery compartment and microphone jack openings and on the battery caps and microphone connector.

The O-rings should be coated with Vaseline® or an equivalent petroleum jelly* before each use to ensure the seals are watertight.

IMPORTANT: Do not use anything other than pure petroleum jelly to lubricate the O-rings. Silicon-based lubricants will dissolvel the O-rings.

Store the unit with no batteries installed, battery caps removed and the microphone disconnected to allow any buildup of humidity and moisture to evaporate.

Vaseline is a registered trademark of Conopco, Inc.

Re-conditioning (drying out) the caps and desiccant beads

An easy way to heat the doors is to use a coffee mug warmer, which typically costs about $10. The surface temperature of about 220 degrees (F) will dry the doors and desiccant, but it will not disturb any light lubricant (like the Vaseline petroleum provided with the WM units) that is on the O-ring seals.

It is also possible to use the mug warmer to dry out the doors without removing them from the case as shown below. **Do not place the transmitter on this heated surface**. Lay it to one side as shown.

The mug warmer used for testing consumed 17 watts, so it could even be used on a sound cart AC supply without being a huge drain on the batteries.

The color of the desiccant beads can be observed by shining a pen light on one edge of the battery cap to illuminate the desiccant. Ideally, they will be an amber/orange color at room temperature.

Replacement O-rings

Model ORINGKIT/WM Includes replacement O-rings for battery caps and microphone plug with WM style connector, and petroleum jelly pouch.

Separate parts:

P/N 35877 O-ring; .433" ID x .623" OD
P/N 35750 O-ring; .312" ID x .437" OD
P/N 32408 petroleum jelly pouch; 5 grams

Replacement battery caps

Early WM transmitters had standard battery caps. Later design included compartments inside the caps containing moisture absorbing desiccant beads. A kit model WM-DESIKIT is available that includes two replacement battery caps, O-rings, lanyards, a center thumbscrew and allen wrench.

The desiccant beads are silica gel grade 52, manufactured by a US Company named ADCOA under part number SG52002. Large containers can be purchased from ADCOA, and small quantities are available from Lectrosonics. Contact Lectrosonics or search online for **adcoa.net** for details.

To replace the beads, remove the retaining screw and vented cover with a Phillips head screwdriver

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®

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