DHu/E01
Digital Handheld Transmitter

LECTROSONICS®

Rio Rancho, NM, USA
www.lectrosonics.com

Table of Contents

General Technical Description

Introduction

The transmitter benefits from a second generation design with specially developed, high efficiency digital circuitry for extended operating time on two AA batteries. The transmitter can tune across the UHF television band from 470.100 to 607.975 MHz, with a selectable output power of 25 or 50 mW. The pure digital architecture enables AES 256-CTR encryption for applications that require high level security.

Input Gain Range and Limiter

45 dB range of input gain adjustment allows gain settings to accurately match the user's voice and the varying sensitivity of different microphone capsules. A DSP-controlled analog audio limiter is employed before the A-D 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. It can be thought of as two limiters in series, a fast attack and release limiter followed by a slow attack and release limiter. The limiter recovers quickly from brief transients, with no audible side effects, and also recovers slowly from sustained high levels to keep audio distortion low while preserving short term dynamics.

Frequency Selection

Operating frequency is normally selected using a receiver or analyzer to assess signals in the local environment to avoid interference. Once an interference-free frequency is identified, the transmitter frequency is set to match the receiver.

The LCD on the transmitter displays frequency in MHz and with a two character hex code that is used on most Lectrosonics receivers.

Antenna

A unique helical antenna allows the transmitter to be held in any position, since the user's hands have little or no effect on the RF output power.

Microphone Capsules

The transmitter is available from Lectrosonics with the HHC and HHVMC cardioid condenser capsules. Capsules from several other manufacturers are also available for use with the HH: those with a 1.25" x 28 thread pitch and three contact rings. Condenser or dynamic microphone capsules can be used to suit the user's preference or the application.

Encryption

When transmitting audio, there are situations where privacy is essential, such as during professional sporting events, in court rooms or private meetings. For instances where your audio transmission needs to be kept secure, without sacrificing audio quality, Lectrosonics introduces Encryption Keys. Truly entropic encryption keys are first created by a Lectrosonics receiver, such as the DSQD Receiver. The key is then synced with the DHu/E01 via the IR port. The audio will be encrypted and can only be listened to if both DHu/E01 and receiver have the matching encryption key. If you are trying to transmit an audio signal and keys do not match, all that will be heard is silence or white noise.

IR (infrared) Sync

An IR Sync Port is used for quick setup with receivers that offer this feature. Settings for frequency, step size and compatibility mode are transferred from receiver to transmitter via the IR ports.

Side Button Functions

A programmable switch on the side of the housing can be configured as a mute/cough switch, a power switch or be disabled.

USB Port for Key Transfer and Firmware Updates

The encryption key is generated in the receiver, then transferred to the transmitter via a USB port using a cable. This requires that the user be in direct contact with both units, which increases the security level.

Firmware updates are enabled by simply downloading a file and utility program from the Lectrosonics web site, connecting the transmitter to a computer via the USB port and running the program.

A mic capsule is threaded onto the body of the transmitter in the direction shown. Do not overtighten it.

Mechanical Assembly

The lower housing opens by rotating it in the direction shown. After the threads are disengaged, pull the housing downward until it engages the detent that holds it open.

The threaded interface is a 1.25" diameter opening with 28 threads per inch and three contact rings

Microphone Capsules:

Lectrosonics offers two types of capsules. The HHC is the standard capsule and the HHVMC is the Variable Mic Capsule which includes adjustments for Bass, Midrange and Treble.

Do not touch the contacts between the mic capsule and transmitter body. When necessary, the contacts can be cleaned with a cotton swab and alcohol.

HHC Lectrosonics cardioid electret

HHVMC Lectrosonics cardioid electret with VariMic preamp

Along with these two models from Lectrosonics, a variety of different capsules with a common thread and electrical interface are available from the major microphone manufacturers.

A list of compatible capsules is on the website at www.lectrosonics.com listed the DHu product page.

Capsule Installation

Capsules are attached with a right-hand thread.

To remove the windscreen from the mic capsule, line up the blue wrench (included with the capsule head) with the flat notches on the lower threaded area of the mic capsule.

Align flats on the wrench with flats on the capsule.

*All product names are trademarks of their respective owners, which are in no way affiliated with Lectrosonics.

Battery Installation

To insert batteries, close the eject lever and insert the upper contacts first (closest to the mic capsule). Polarity is marked on the label in the bottom of the battery compartment.
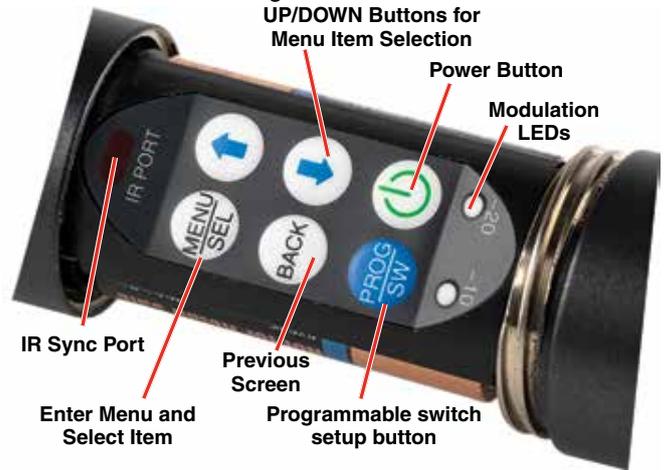
Close eject lever to install batteries

The contacts are very tight to prevent the batteries from "rattling" as the transmitter is being handled. Pull the eject lever outward to remove the batteries. The battery tips will move outward, making them easier to grasp.

Pull eject lever outward to release batteries from contacts

Control Panel

Six membrane switches on the control panel are used to set up the transmitter by navigating the menus on the LCD and selecting the desired values.

UP/DOWN Buttons for Menu Item Selection

Power Button

Modulation LEDs

IR Sync Port

Previous Screen

Enter Menu and Select Item

Programmable switch setup button

Setup and Adjustments

Powering On

Press and hold the Power Button for several seconds until a countdown on the LCD is completed. The countdown from 1 through 3 will appear on the LCD, followed by a display of the model, firmware version, frequency band and compatibility mode.

```
Hold          DHu/E01
for           V1.01
Rf On
...3
```
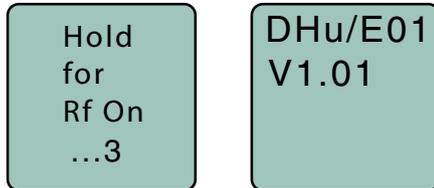
When you release the button, the unit will be operational with the RF output turned ON and the Main Window displayed.

```
DHu/E01
  ▽·))         The Main Window
545.400        RF output ON
-40   -20   0'
```
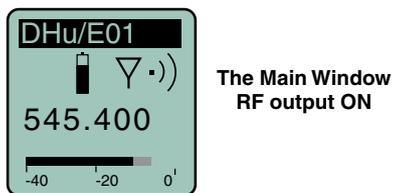
If you release the button before the countdown is complete, the unit will turn on in the Standby mode with the RF output turned OFF and the antenna icon will blink.

```
DHu/E01
              The Main Window
545.400        RF output OFF
-40   -20   0'
```
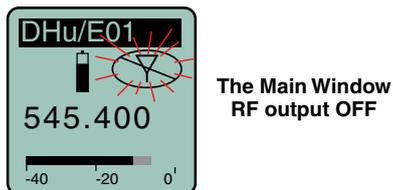
Powering Off

Press and hold the Power Button (or the side button if it is configured for turning the power on and off) for several seconds and observe the LCD countdown progress from 3 to 1. The power will then be turned off. This can be done from any menu or screen.
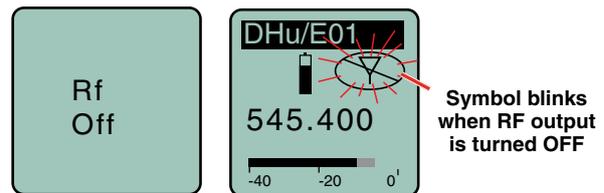
```
Powering
Off . . .


   1
```

NOTE: If the Power Button is released before the countdown is completed, the unit will remain turned on and the LCD will return to the same screen or menu that was displayed previously.

Standby Mode

A brief push of the keypad Power Button turns the unit on and places it into a "standby" mode (not transmitting). Press the button until the countdown begins, then release the button. This allows the transmitter to be set up without the risk of creating interference for other wireless systems that are operating in the vicinity.

A notice will appear briefly confirming that the RF output of the transmitter is turned off, followed by the Main Window. The antenna symbol will blink as a reminder that the RF output is turned off.

```
Rf            DHu/E01
Off                        Symbol blinks
              545.400      when RF output
              -40  -20  0'  is turned OFF
```

Power Menu

```
Resume
Pwr Off
Rf On?
Backlit
```

When the transmitter is turned on, a brief push of the Power Button on the keypad will reveal a menu allowing you to choose between **Resume**, **Pwr Off**, **Rf On?**, **Backlit** and **About**.

Use the UP/DOWN buttons to select one of the menu items, then press the MENU/SEL button to confirm this action.

- **Resume:** Continue operating in the same condition as before.

- **Pwr Off:** Turns off the transmitter.

- **Rf On?:** Begin transmitting the RF signal, enters another screen prompting a **Yes** or **No** answer.

- **Backlit:** The LCD includes a backlight that illuminates the display for easier viewing. It is set to come on when any button on the control panel is pressed, then stay on for either 30 seconds or 5 minutes, or to stay on all the time.

- **About**: Displays the model, firmware version, frequency block and compatibility mode.

The unit can also be turned off from any menu or screen on the LCD by holding the power button in for the duration of the countdown.
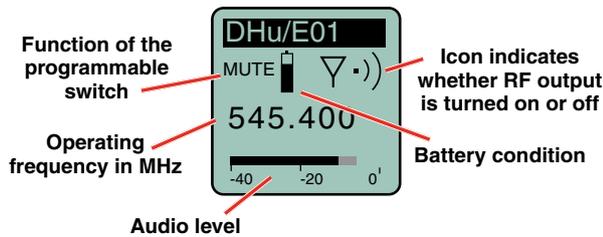
Battery Condition

An icon on the Main Window indicates the approximate remaining power of the batteries. This battery gauge is most accurate with the typical voltage drop across the life of alkaline batteries.

DHu/E01
545.400
-40   -20   0

Battery Gauge
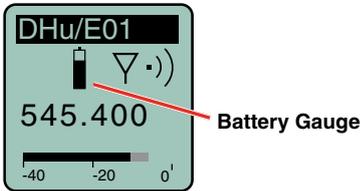
Rechargeable batteries give little or no warning when nearing depletion. If you use rechargeable batteries in the transmitter, we recommend trying fully charged batteries first, noting the length of time that the batteries will run the unit, and in the future using somewhat less than that time to determine when the battery needs to be replaced. The Venue and other receivers from Lectrosonics offer a timer function to assist in this process.

Navigating Menus and Screens
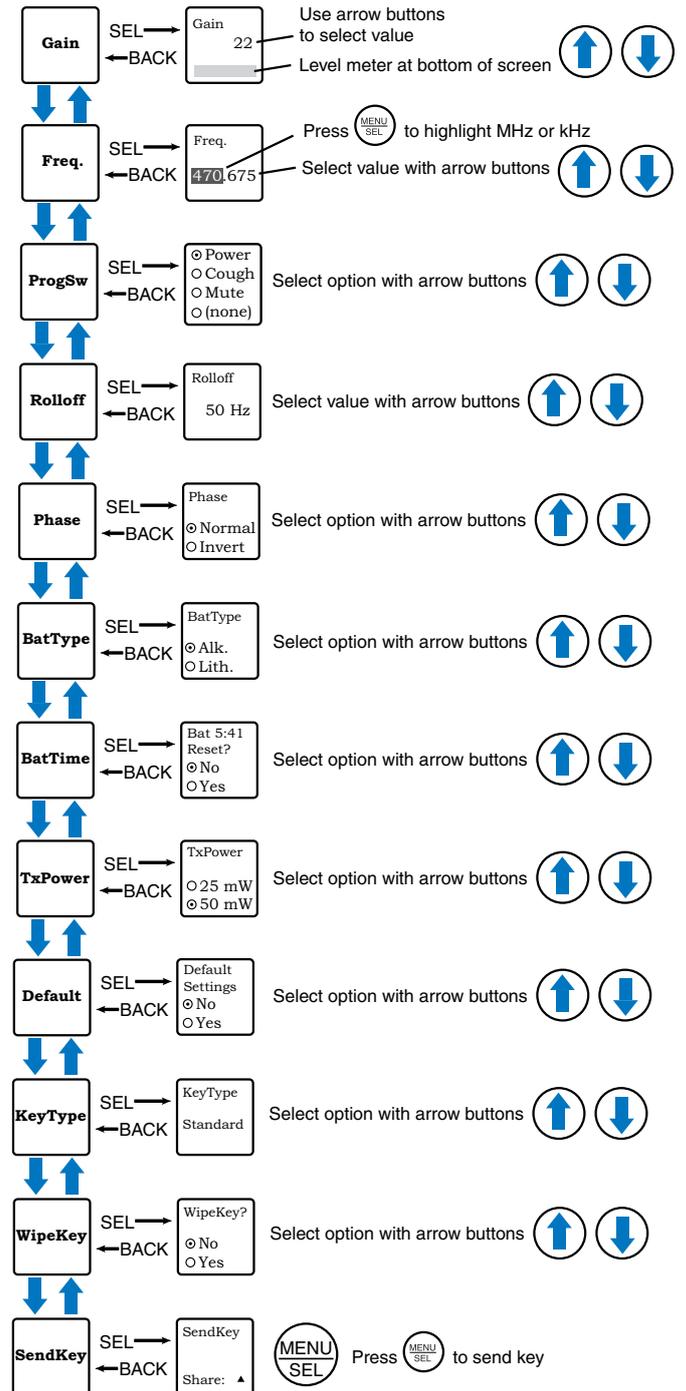
The *Main Window* displays the following information:

Function of the programmable switch

Icon indicates whether RF output is turned on or off

Operating frequency in MHz

DHu/E01
MUTE
545.400
-40   -20   0

Battery condition

Audio level

1) Press the MENU/SEL button to enter the setup menu. Use the UP/DOWN buttons to highlight the menu item.

2) Press the MENU/SEL button to enter the setup screen for that item. Use the UP/DOWN buttons to select the desired value or mode.
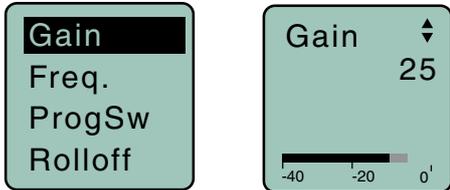
Gain
Freq.
ProgSw
Rolloff

Gain
25
-40   -20   0

3) Press the MENU/SEL button to save this setting and return to the previous screen.

4) Press the **BACK** button to return to the Main Window.

Menu Map

|			
Gain	SEL→ ←BACK	Gain 22	Use arrow buttons to select value — Level meter at bottom of screen
Freq.	SEL→ ←BACK	Freq. 470.675	Press MENU/SEL to highlight MHz or kHz — Select value with arrow buttons
ProgSw	SEL→ ←BACK	⊙Power ○Cough ○Mute ○(none)	Select option with arrow buttons
Rolloff	SEL→ ←BACK	Rolloff 50 Hz	Select value with arrow buttons
Phase	SEL→ ←BACK	Phase ⊙Normal ○Invert	Select option with arrow buttons
BatType	SEL→ ←BACK	BatType ⊙Alk. ○Lith.	Select option with arrow buttons
BatTime	SEL→ ←BACK	Bat 5:41 Reset? ⊙No ○Yes	Select option with arrow buttons
TxPower	SEL→ ←BACK	TxPower ○25 mW ⊙50 mW	Select option with arrow buttons
Default	SEL→ ←BACK	Default Settings ⊙No ○Yes	Select option with arrow buttons
KeyType	SEL→ ←BACK	KeyType Standard	Select option with arrow buttons
WipeKey	SEL→ ←BACK	WipeKey? ⊙No ○Yes	Select option with arrow buttons
SendKey	SEL→ ←BACK	SendKey Share: ▲	MENU/SEL Press MENU/SEL to send key

Gain

This setting is very important since it can have a significant effect on the signal to noise ratio the system will deliver. The gain adjustment can even affect the operating range of the wireless system. Gain must be set according to the individual voice, the mic capsule in use and the handling technique of the user. LEDs in the control panel facilitate accurate gain adjustment.

```
Gain          Gain      ▲▼
Freq.                    25
ProgSw
Rolloff
              -40   -20    0'
```

> IMPORTANT: See the section **Input Gain Adjustment** on page 9 for details.

Freq.

The operating frequency is normally determined using the scanning function in the receiver or with coordination software. The frequency is shown on the transmitter LCD display in MHz and with a hexadecimal code that is used on most Lectrosonics receivers.

```
Gain          Freq      ▲▼
Freq.
ProgSw             628.200
Rolloff
              -40   -20    0'
```
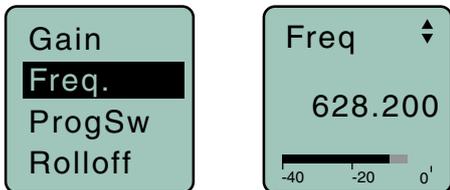
ProgSw

The Programmable Switch on the housing can be set to provide several functions, or it can be bypassed.

```
Gain          Functions:
Freq.            Power
                 Cough
ProgSw           Mute
                 (none)
Rolloff          TalkBk
```

Rolloff

A low frequency roll-off filter can be set for a -3dB point at 35, 50, 70, 100 or 125 Hz. Roll-off slopes are 12.2 dB/octave at 35 Hz and 10.1 dB/octave at 70 Hz through 125 Hz.

```
Gain          Rolloff   ▲▼
Freq.
ProgSw             70 Hz
Rolloff
```

The roll-off frequency is normally adjusted by ear to suit personal preferences.

Phase

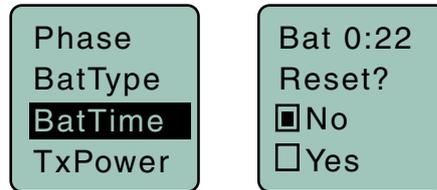The phase (polarity) of the audio can be inverted to match other microphone capsules as needed.

```
Rolloff    ▲     Phase
Phase
BatType          ■Normal
BatTime    ▼     □Invert
```
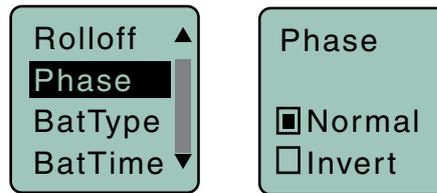
BatType

Selects the type of batteries being used; alkaline or lithium.

```
Phase            BatType
BatType
BatTime          ■Alk.
TxPower          □Lith.
```
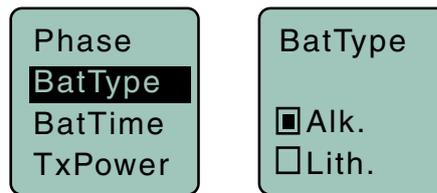
BatTime

Resets the battery timer to zero.
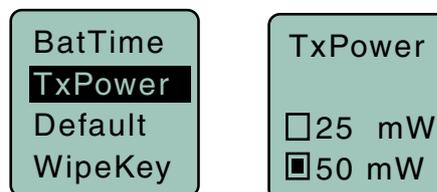
```
Phase            Bat 0:22
BatType          Reset?
BatTime          ■No
TxPower          □Yes
```

TxPower

Output power can be set to 100 mW to extend operating range (which can also suppress noise and dropouts to some extent) or set to 50 mW to slightly extend the operating life of the batteries.

```
BatTime          TxPower
TxPower
Default          □25  mW
WipeKey          ■50 mW
```

Default

The default setting simple returns the transmitter back to the factory settings and any of the menu items can be readjusted from that default point.
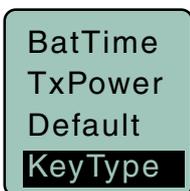
```
BatTime          Default
TxPower          settings
Default          □No
WipeKey          ■Yes
```
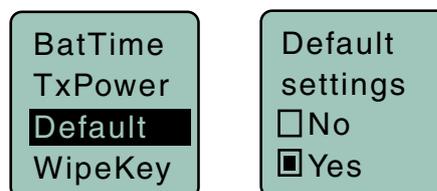
KeyType

The DHu receives an encryption via the IR port from a key generating receiver. Begin by selecting a key type in the receiver and generating a new key (key type is labeled KEY POLICY in the DSQD receiver). Set the matching KEY TYPE in the DHu and transfer the key from the receiver (SYNC KEY) to the DHu via the IR ports. A confirmation message will display on the receiver display if the transfer is successful. The transmitted audio will then be encrypted and can only be listened to if the receiver has the matching encryption key.

The DHu has three options for encryption keys:

• **Standard:** This is the highest level of security. The encryption keys are unique to the receiver and there are only 256 keys available to be transferred to a transmitter. The receiver tracks the number of keys generated and the number of times each key is transferred.

• **Shared:** There are an unlimited number of shared keys available. Once generated by a receiver and transferred to the DHu, the encryption key is available to be shared (synced) by the DHu with other transmitters/receivers via the IR port. When a transmitter is set to this key type, a menu item named SEND KEY is available to transfer the key to another device.

• **Universal:** This is the most convenient encryption option available. All encryption-capable Lectrosonics transmitters and receivers contain the Universal Key. The key does not have to be generated by a receiver. Simply set the DHu and a Lecrosonics receiver to Universal, and the encryption is in place. This allows for convenient encryption amongst multiple transmitters and receivers, but not as secure as creating a unique key.

```
BatTime
TxPower
Default
KeyType
```

```
KeyType

Standard
```

WipeKey

This menu item is only available if Key Type is set to Standard or Shared. Select Yes to wipe the current key and enable the DHu to receive a new key.

```
TxPower
Default
KeyType
WipeKey
```

```
WipeKey?

☐No
☑Yes
```

SendKey

This menu item is only available if Key Type is set to Shared. Press Menu/Sel to sync the Encryption key to another transmitter or receiver via the IR port.

```
Default
KeyType
WipeKey
SendKey
```

```
SendKey

Share:    ▲
```

IInput Gain Adjustment

While the digital system has an excellent signal to noise ratio over a wide range of gain adjustment, it is still good practice to set the gain close to full modulation. The two bicolor Modulation LEDs (located at the bottom of the control panel) are used to accurately adjust the gain. They are upside/down from the keypad for viewing with the capsule close to your mouth.
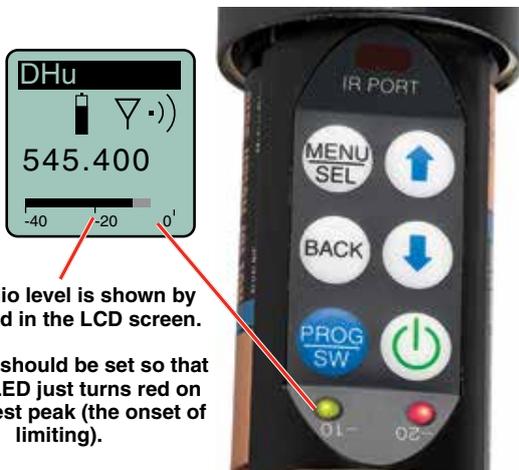
The audio level is shown by LEDs and in the LCD screen.

The gain should be set so that the -20 LED just turns red on the loudest peak (the onset of limiting).

The LEDs will glow either red or green to indicate modulation levels as shown in the following table.

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

It is best to go through the following procedure with the transmitter in the "standby" mode so that no audio will enter the sound system, which could cause feedback.

1) With fresh batteries in the transmitter, power the unit on into "standby" mode (RF output off)

2) Press the MENU/SEL button once to enter the setup menu. Use the UP/DOWN buttons to select **Gain**. Press the MENU/SEL button again to enter the setup screen.

3) Hold the microphone the way it will be used in actual operation.

4) Speak or sing at the same voice level that will actually be used during the program, while observing the modulation LEDs. Use the UP/DOWN buttons to adjust the gain until the **–20 dB** LED starts to flicker red and the **–10 dB** glows green.

5) Once the audio gain has been set, the signal can be sent through the sound system for overall level adjustments, monitor settings, etc. To do this, the unit must be set to transmit (see **Powering On and Off**, and the **Standby Mode** on page 6).

Programmable Switch Functions

A special button on the outside of the housing can be configured to provide several different functions, or to be inoperative by selecting **(none)**.

Programmable Switch
- **Power**
- **Cough**
- **Mute**
- **(none)**
- **TalkBk**

The **ProgSw** button on the keypad opens a setup screen to select the programmable switch function. Enter this setup screen and then use the UP/DOWN arrows to select the desired function and press the MENU/SEL button to return to the Main Window.

Press the PROG/SW button or select ProgSw in the main menu.

**PROG/SW Button**

Gain
Freq.
ProgSw
Rolloff

The **ProgSw** menu provides a scrollable list of the available functions. Use the UP/DOWN arrows to highlight the desired function and press BACK or MENU/SEL to select it and return to the main menu.

ProgSw ⬍
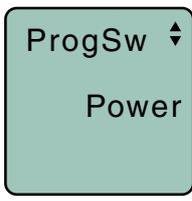
Power

Power turns the power on and off. Hold the button on the housing in until the countdown sequence from 3 to 1 is completed. The power will then be turned off.

NOTE: When the button on the housing is set to **Power**, it will turn on the transmitter in the operating mode with the RF output on. Use the power button on the keypad to turn on the transmitter in the Standby Mode.

ProgSw ⬍
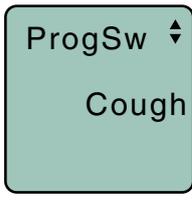
Cough

Cough is a momentary mute switch. Audio is muted while the button on the housing is held in.

ProgSw ⬍
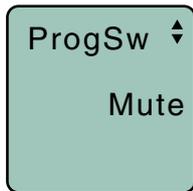
Mute

Mute is a "push on/push" off function that toggles on and off each time the button on the housing is pressed. The mute function defeats the audio in the transmitter, so it works in all compatibility modes and with all receivers.

ProgSw ▲
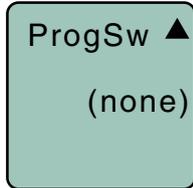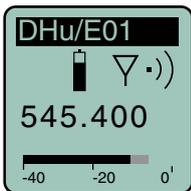
(none)

(none) disables the button on the housing.

ProgSw

TalkBk

TalkBk is a "push to talk" function that is active only while the button is pressed. The talkback function provides a communication channel when used with a receiver equipped with this function, such as a Venue Wideband receiver with firmware Ver. 5.2 or higher. When pressed and held in, the side button re-directs the audio output to a different audio channel on the receiver. As soon as the switch is released, audio is returned to the program channel.

Main Window Displays for Function

The function of the Programmable Switch is displayed in the LCD Main Window. In the None and Power functions, no indication is displayed. In the Mute and Cough functions, the word MUTE is displayed.
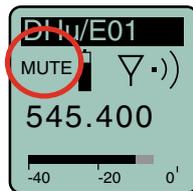
None/Power   **Mute/Cough**

When the button on the housing is pressed, the function will be active and the LCD will display an indication for the Mute and Cough functions. The word MUTE will be shown in reverse video and the audio level bar at the bottom of the display will be replaced by a blinking word MUTE.

Reverse video

**Mute active
(MUTE blinks)**

Parts and Accessories

#CCHH - Zippered Pouch

Padded zipper pouch for handheld transmitter

#26872 Mic Capsule Wrench

Custom wrench for removing windscreen from mic capsule

#13585 Mic Clip

Screw on mic clip for standard mic stands with 5/8"-27 thread

HHXTND

Extender to for use with microphone flags commonly used in ENG for network or station ID to keep the flag from covering the side switch and LCD

HH2SEN Adapter

Adapts Sennheiser G2, G3 and 2000 Series microphone capsule heads to the HH transmitter.

Transmitter interface   **Capsule interface**

HHA Adapter by Ambient Recording

Adapts Neumann KK104 and KK105 and Sennheiser capsules for the 5000 Series wireless with Shure style threads to the DHu transmitter

HHA is available from Ambient Recording dealers

Visit: www.ambient.de

Firmware Update

Updating the firmware is a simple matter of downloading a utility program and file from the website and running the program on a **Windows operating system** with the transmitter connected to a computer via the USB port.

Go to www.lectrosonics.com/US. In the top menu, hover the mouse over Support, and click on Wireless Support. On the right-hand-side Wireless Support Menu, choose Wireless Downloads. Choose your product (HHa), then choose Firmware.
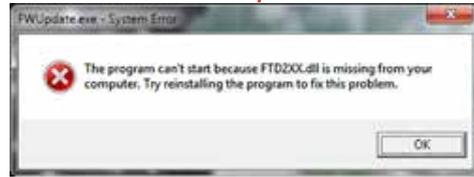
Step 1:

Begin by downloading the USB Firmware Updater Program.

Step 2:

Next, test the Updater by opening the icon: If the driver opens automatically, proceed to Step 3.

WARNING: If you receive the following error, the Updater is not installed on your system. Follow the TROUBLESHOOTING steps to fix the error.

TROUBLESHOOTING:

If you receive the FTDI D2XX error shown above, download and install the driver by clicking on this link.

Then click here to download.

NOTE: This website, http://www.ftdichip.com/Drivers/D2XX.htm, is not associated with Lectrosonics.com. It is a third party site used only for D2XX drivers currently available for Lectrosonics' devices' upgrades.
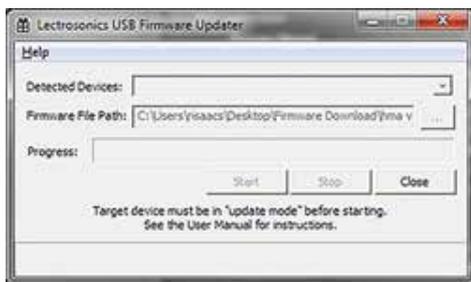

Step 3:

Refer to Step 1 to return to Firmware web page. Download Firmware Update and save to a local file on your PC for easy locating when updating.
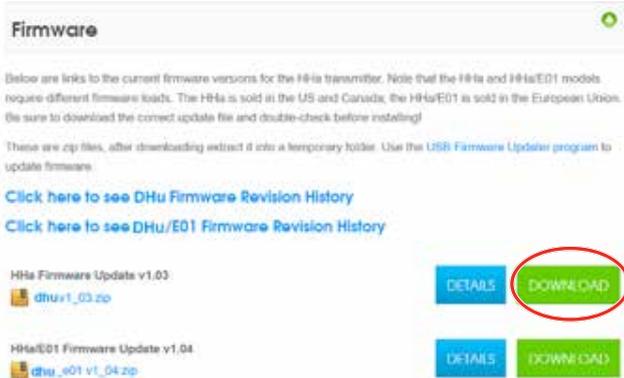
Step 4:
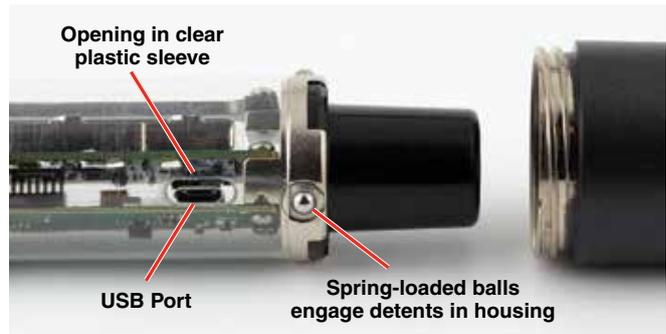
Open Lectrosonics USB Firmware Updater.

Step 5:

UPDATE

Put the transmitter in UPDATE mode by simultaneously holding down the *BACK* and *UP* arrow buttons on the transmitter control panel while powering it up.

Step 6:

Using a microUSB cable, connect the transmitter to your PC.

Remove the lower housing of the transmitter by unscrewing it from the housing attached to the capsule and pulling it straight off the body of the transmitter to expose the circuitry. Spring-loaded ball detents provide a "stop" with only the control panel exposed. Continue to pull the lower housing farther to remove it. Simply push the lower housing back onto the transmitter body to re-install it.

The USB port on the transmitter requires a micro-B male plug on the connecting cable. The other end of the cable would normally be a USB A-Type male connector to fit the most common type of USB jack used on computers.
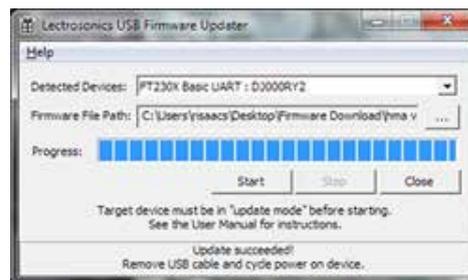

Opening in clear plastic sleeve

USB Port

Spring-loaded balls engage detents in housing

Step 7:

In Lectrosonics USB Firmware Updater, choose the detected device, browse to local Firmware File and click Start.

NOTE: It may take up to a minute or so for the Updater to recognize the transmitter.
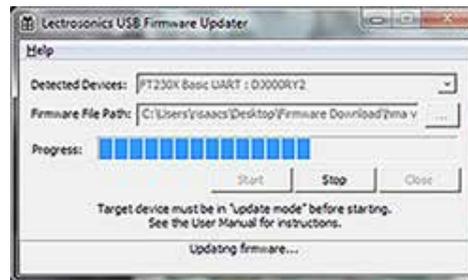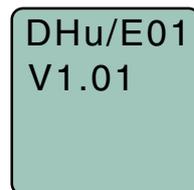

WARNING: Do not disrupt the microUSB cable during updating.

The Updater alerts with progress and completion.

Step 8:

DHu/E01 V1.01

Once the Updater has completed, turn off the transmitter, then turn it back on to verify that the firmware version on the transmitter LCD matches the firmware version shown on the web site.
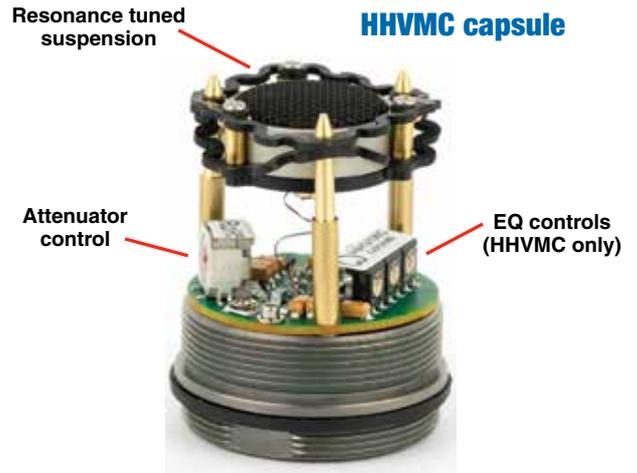
Mic Capsule Adjustments

(EXPERT LEVEL ADJUSTMENT)

These adjustments significantly alter the gain and tonal quality of the microphone, and are to be used only in special circumstances.

Caution: Always make the final decision about sound quality with the windscreen in place.
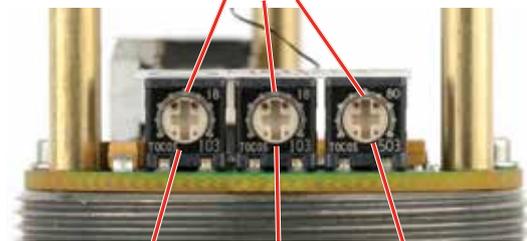
Remove the windscreen using the supplied wrench.

Align flats on the wrench with flats on the capsule.

Attenuator Adjustment

The HHC & HHVMC heads include an attenuator in the preamp circuitry to provide an additional 15 dB of headroom when needed for extremely loud voices.

The attenuator should **ONLY** be used **when the gain control in the menu is already turned all the way down** and the audio is still driving the preamp into significant limiting where both -20 and -10 dB LEDs often light up red or stay red during peaks in the audio.
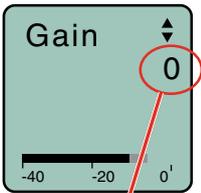
Gain set to minimum (0) on the LCD.

LEDs on control panel

The attenuator control is a 16-position switch that attenuates the audio in 1 dB steps. It is marked **0** through **F** where **F** is minimum attenuation and **0** is maximum attenuation. Rotating it clockwise increases the loudness, and counter clockwise decreases the loudness.

Attenuator switch set at F for normal operation.
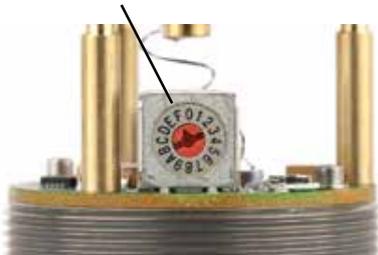
Reset the switch to F for subsequent users

Resonance tuned suspension

HHVMC capsule

Attenuator control

EQ controls (HHVMC only)

LO/MID/HI (bass/mid/treble) - HHVMC only

The HHVMC head includes VariMic™ equalization adjustments to boost or cut the frequency response in LOW, MID and HIGH ranges. The LOW and HIGH controls will boost/cut by up to 8 dB while the MID control will boost/cut up to 6 dB.

The pointer is between the darkened dots.

LOW   **MID**   **HIGH**

The controls are set to "zero" (no boost or cut) in this photo

These controls operate as standard tone controls in that a counterclockwise adjustment cuts the response in that band and a clockwise adjustment boosts the response.

VariMic Tone Control Range
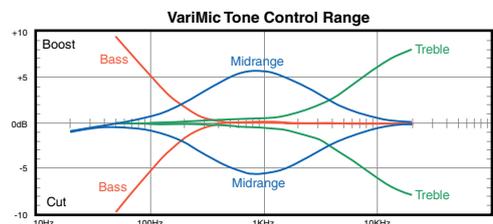
Troubleshooting

SYMPTOM	POSSIBLE CAUSE

TRANSMITTER WILL NOT POWER ON
1) Batteries are inserted backwards.
2) Batteries are dead, or too low to be used.

MODULATION LEDs DO NOT LIGHT
1) Audio Gain set too low.
2) Mic capsule is damaged or malfunctioning. Try a different capsule or contact the factory for repair.

MODULATION LEDs INDICATE BUT NO SOUND
1) Talkback function is engaged (release the button on the housing). See p. 10.
2) Check receiver display for audio level indication
3) Receiver on wrong frequency or wrong band.
4) Receiver connected incorrectly to sound system.
5) Transmitter in standby mode.

RECEIVER RF INDICATOR OFF
1) Transmitter not turned on.
2) Transmitter is in "standby" (non-transmitting) mode. Check the LCD for the antenna/transmission icon status.
3) Batteries are dead or installed backwards.
4) Receiver antenna missing, defective or improperly positioned.
5) Transmitter and receiver not on the same frequency.
6) Operating range is too great.
7) Receiver antenna missing, incorrect frequency or disconnected.

NO SOUND BUT RECEIVER AUDIO LEVEL METER INDICATES SOUND
1) Receiver audio is muted. (Unmute receiver.)
2) Receiver audio output levels set too low.
3) Receiver audio output is disconnected or cable defective or mis-wired.
4) Sound system or recorder input level is turned down.

DISTORTED SOUND
1) Transmitter Audio Gain set too high. Speak or sing into the transmitter and check the Audio Level LEDs and/or Audio Level bar graph in the transmitter LCD and corresponding indicators on the receiver.
2) Receiver output level may be too high for the sound system or recorder input.
3) Excessive wind noise or "breath pops." Microphone may require an additional wind screen.
4) Mic capsule damaged or defective

HISS AND NOISE -- AUDIBLE DROPOUTS
1) Transmitter Audio Gain set too low. See page 9 for proper audio gain setting.
2) Receiver antenna missing, defective or obstructed.
3) Operating range too great.
4) Interference may be present. Turn transmitter off and observe the RF level indicator on the receiver. Change frequency if necessary.
5) With Lectrosonics HHC or HHVMC: return attenuator control back to default setting of "F" (see opposite page), then readjust audio gain per instructions on page 9.

EXCESSIVE FEEDBACK
1) Transmitter Audio Gain set too high. Check level adjustment, reduce receiver output level, or both.
2) Microphone too close to speaker system.
3) Move microphone closer to the user's mouth and lower the sound system volume.

Specifications

Frequency range:	470.100 - 614.375 MHz [†]
Frequency selection steps:	Selectable; 100 kHz or 25 kHz
RF Power output:	Selectable; 25 or 50 mW
Frequency stability:	± 0.002%
Digital Modulation:	8 psk
Spurious radiation:	Compliant with ETSI EN 300 422-1
Operating temperature range:	-20° C to +50° C
Input compressor:	Dual envelope compressor, >30 dB range
Gain control range:	45 dB; semi-log menu-driven control; 1 dB steps
Modulation indicators:	Dual bicolor LEDs indicate modulation of -20, -10, 0 and +10 dB referenced to full modulation, LCD bar-graph indicator
Frequency response	40 Hz to 20 kHz (+/- 1dB)
Low frequency roll-off:	-3 dB @35, 50 and 70 Hz; selectable; 36 dB/octave
Controls:	
External:	Programmable mute/talkback button
Battery compartment:	Power, mute disable, menu/select, back and up/down arrow buttons for menu selection and settings.
Battery:	2x AA with polarity protection and battery ejector
Battery life:	At 50 mW: 5 hours (Duracell Procell) (The DHu/E01 transmits battery status to Lectrosonics receivers.)
Capsule Interface:	1.25" opening and 28 thread pitch Power available: 5V, 25 mA max Input impedance: 1000 Ohms
Weight:	12.1 oz. with batteries and HHC capsule
Dimensions:	9.5" long x 1.97" diameter at largest point

Emission Designator: 200KG1E

Specifications subject to change without notice.

[†] Not all frequency bands available in all countries. Consult your local representative or contact Lectrosonics for more information.

Declaration of Conformity

LECTROSONICS®
P.O. Box 15900 - Rio Rancho, NM - 87174 - USA
Phone: (800)821-1121 or (505)892-4501 - Fax: (505)892-6243
web: www.lectrosonics.com - email: sales@lectrosonics.com

EU Declaration of Conformity

LECTROSONICS, INC.
581 Laser Road
Rio Rancho, NM 87124 USA

Declares under our sole responsibility that the following product:

Model: DHU/E01

Wireless microphone transmitter

is in conformity with the provisions of the following EC directive(s) (including applicable amendments) and are designed and manufactured in accordance with the harmonized standards:

Document	Description	Date/Version
RL 2014/53/EU	**Radio Equipment Directive 2014/53/EU (RED)**	**2014-04**
EN 300 422-1	Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Class A Receivers	V2.1.2 (2017-01)
	Electromagnetic Compatibility	
EN 301 489-1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Common Technical Requirements	V2.2.0 (2017-03)
EN 301 489-9	Specific Conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices	V2.1.1 (2017-03)
	Safety and Health	
EN 60065-1	Audio, video and similar electronic apparatus – Safety Requirements	2014
EN 62311	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)	2008
RL 2011/65/EU	**RoHS Directive 2011/65/EU: Restriction of the use of certain hazardous substances (RoHS Recast)**	**2011**

The EU type examination was performed by notified body Bay Area Compliance Laboratories.

Software version of DHU/E01: v0.10

Rio Rancho, NM USA, 07 Sep 2017

Robert Cunnings
V.P. Engineering
Lectrosonics, Inc.

Service and Repair

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check the interconnecting cables and then go through the **Troubleshooting** section in this manual.

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment. **There are no adjustments inside that will make a malfunctioning unit start working**.

LECTROSONICS' Service Department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out-of-warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out-of-warranty repairs.

Returning Units for Repair

For timely service, please follow the steps below:

A. DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 A.M. to 4 P.M. (U.S. Mountain Standard Time).

B. After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the **outside** of the shipping container.

C. Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.

D. We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Mailing address:	Shipping address:	Telephone:
Lectrosonics, Inc.	Lectrosonics, Inc.	(505) 892-4501
PO Box 15900	581 Laser Rd.	(800) 821-1121 Toll-free
Rio Rancho, NM 87174	Rio Rancho, NM 87124	(505) 892-6243 Fax
USA	USA	

Web:	E-mail:
www.lectrosonics.com	sales@lectrosonics.com

Lectrosonics Canada:

Mailing Address:	Telephone:	E-mail:
720 Spadina Avenue,	(416) 596-2202	Sales: colinb@lectrosonics.com
Suite 600	(877) 753-2876 Toll-free	Service: joeb@lectrosonics.com
Toronto, Ontario M5S 2T9	(877-7LECTRO)	
	(416) 596-6648 Fax	

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®

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

12 March 2019