DSSM

Digital Wireless Water-Resistant Micro Body Pack Transmitter

DSSM-A1B1, DSSM-B1C1, DSSM/E01-A1B1, DSSM/E01-B1C1, DSSM/E07-941

IP57
Watertight

Follow Us On:

Fill in for your records:

Serial Number:

Purchase Date:

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

What is IP57?

IP ratings indicate how resistant an electrical device is to water and common materials - like dirt, dust and sand.

The DSSM's IP57 rating indicates that that it is water resistant up to 1 meter (3.2 feet) for 30 minutes - perfect for your most demanding environments.

WARNING: the water-resistant properties of this transmitter are only possible if the unit is fully closed before it gets wet. This requires both battery door corners to "click" thus indicating a full and complete seal. After the unit gets wet, always be careful to wipe off excess moisture before opening the unit to replace the battery.

Placing Battery Correctly

When placing a battery into the DSSM, place it connector end first, sliding the connection points on the battery against the connection points in the battery chamber and pressing the back of the battery down. Attempting to place it backwards to "snap into place" can result in damage to your battery or to your DSSM.

Yes

No

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Table of Contents

Introduction

The DSSM is the enhanced, fully digital successor to the SSM, while being IP57 rated for moisture and particulate resistence and offering dock charging capability.

The DSSM is ideal in theater, TV, film and broadcast where concealment is desired and water-resistance is required. The DSSM offers an extensive feature set and performance packed into an exceptionally compact housing, compatible with all current Lectrosonics digital receivers, including the DSR, DSR4, DSQD, DCR822, M2Ra and DCHR.

The DSSM includes specially developed, highly efficient circuitry for extended operating time on the rechargeable LB-50 battery. RF power selections are offered at 10 and 35 mW (D2 compat mode) and a special high density (HDM) mode at 2 mW.

The servo bias input accepts mic or line level signals with a wide range of gain adjustment in 1 dB steps. Accurate indications on the display allow precise gain adjustments to be made for the maximum signal to noise ratio and minimum distortion. The limiter in the preamp can cleanly handle signal peaks over 30 dB above full modulation, allowing the input gain to be set high enough to achieve the maximum signal to noise ratio, yet provide protection against input overload.

The audio input jack is a common miniature 3-pin connector with a threaded collar adding additional ruggedness. An IR (infrared) port next to the SMA antenna mount allows transfer of frequency and compatibility mode settings.

The membrane switch panel and OLED display enable access to all adjustments and settings. The menu struc-ture is easy to navigate. Battery status is indicated by a bi-color LED that is green with a fresh battery, then turns to red as the battery runs down, and finally starts blinking red when there are only a few minutes of runtime remaining.

The housing is constructed of machined aluminum alloy, treated in the conductive, super hard electroless nickel ebENi finish.

A flexible, repositionable wire belt clip (to orient the antenna facing up or down) is included.

The optional CHSDSSM battery charging station (*shown below*) provides a convenient and organized means of recharging up to 4 LB-50 batteries or DSSM transmitters in larger systems with numerous batteries in regular use. Each charging module may be daisy-chained to 3 additional modules using a single AC-DC power supply (DCR5/9AU - not included) for a total of 16 units charging at once.

What is IP57?

IP ratings indicate how resistant an electrical device is to water and common materials - like dirt, dust and sand.

The DSSM's IP57 rating indicates that that it is water resistant up to 1 meter (3.2 feet) for 30 minutes - perfect for your most demanding environments.

CAUTION: DO NOT REMOVE the threaded screw where indicated, as that will void the warranty and IP rating.

600MHz Wireless Guard Band and Duplex Gap

You'll notice that our B1C1 range for North America takes advantage of two sets of spectrum space within the 600 MHz band, as designated by the FCC auction. The 600 MHz band is made up of the following four parts:

- Guard Band (614-617 MHz)
- Downlink Band (617-652 MHz)
- Duplex Gap (652-663 MHz)
- Uplink Band (663-698 MHz)

Wireless microphone devices in North America are limited to the Guard Band (614-617 MHz) and Duplex Gap (652-663 MHz).
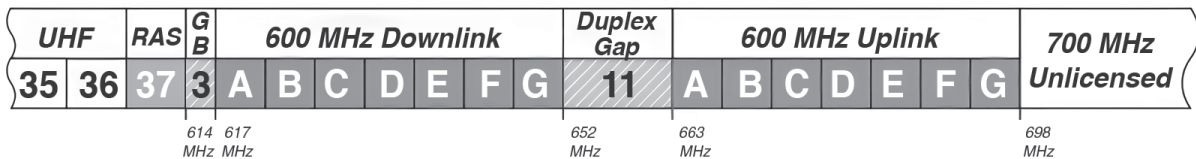
The Guard Band consists of:

- 614-616 MHz: 2 MHz (unlicensed operators)
- 616-617 MHz: 1 MHz buffer (unavailable for use)

The Duplex Gap consists of:

- 652-653 MHz: 1 MHz buffer (unavailable for use)
- 653-657 MHz: 4 MHz (licensed operators only)
- 657-663 MHz: 6 MHz (unlicensed and WSDs)

> Power is limited to 20mW for wireless microphones used in this part of the spectrum.

UHF		RAS	G B	600 MHz Downlink							Duplex Gap	600 MHz Uplink							700 MHz Unlicensed
35	36	37	3	A	B	C	D	E	F	G	11	A	B	C	D	E	F	G	

614 MHz 617 MHz   652 MHz   663 MHz   698 MHz

Battery Installation

The battery compartment and door catch are designed for simple and quick battery changes, yet prevent the door from being opened accidentally. Press both release catches inward to open.

Insert battery into compartment, contact end first. Line the contacts on the battery up with the contacts on the unit, then press the back end of the battery into compartment.

CAUTION: Use only the Lectrosonics LB50 battery and Lectrosonics battery chargers.

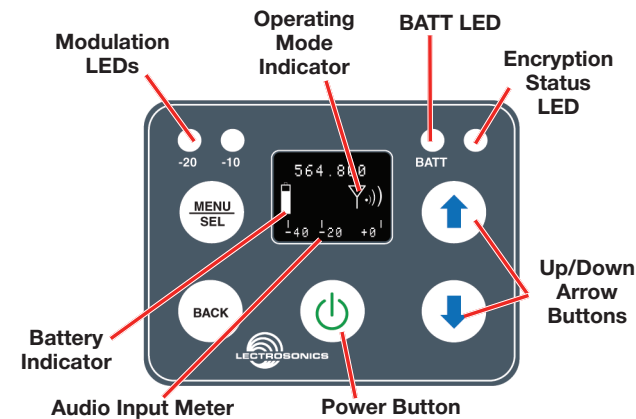*WARNING: Risk of fire or explosion if the battery is replaced by an incorrect type.*

WARNING: the water-resistant properties of this transmitter are only possible if the unit is fully closed before it gets wet. This requires both battery door corners to "click" thus indicating a full and complete seal. After the unit gets wet, always be careful to wipe off excess moisture before opening the unit to replace the battery.

Controls and Functions

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. See the **Adjusting Input Gain** section for additional information.

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

OLED Screen

The display is a matrix OLED with menus and screens for adjusting various modes and options.

BATT LED and Battery Indicator

The battery LED glows green when the battery is good, and the battery icon is solid and steady. The LED color changes to red when there is limited operating time remaining. When the battery is extremely low and the unit is about to turn off, the LED will blink, a few minutes before the unit powers itself down.

The exact point at which the LED turns red will vary with temperature and current drain. The LED is intended to simply catch your attention, not to be an exact indicator of remaining time.

The LED next to the BATT LED (Encryption Status) will glow blue if the unit is transmitting and has a valid encryption key.

MENU/SEL Button

The **MENU/SEL** button is used to access the MENU tree. The ⬆ and ⬇ arrows allow you to scroll through the list. Pressing **MENU/SEL** again allows you to access that selection's submenu. Pressing the **BACK** button returns you to the previous screen.

Power Button

Turns the unit on and off. A brief press turns power on in a Standby Mode to make settings without interfering with other wireless systems in the vicinity. Pressing and holding the button until a bar on the display completes a sequence turns the power on with the RF output turned on. Pressing and holding for the duration of a bar sequence turns the unit off.

Audio Input Meter

This shows the audio signal level on a scale of -40 to +0 dB. A small box with the letter "L" will appear at the far right when the audio signal goes into limiting.

UP and DOWN Arrow Buttons

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

Encryption Status LCD/LED Indicator Modes

- **StandBy:** Blue LED is OFF and Operating Mode Indicator icon has a line through it
- **Missing/Wrong Key:** LED is FLASHING when unit is transmitting, along with <-KEY?-> flashing below the Operating Mode Indicator.
- **Transmitting:** Blue Light is steadily ON when key is valid.
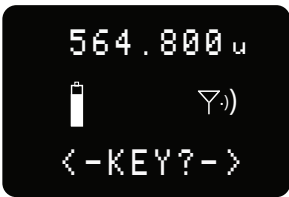
Turning LEDs ON and OFF (Shortcut)

From the main "home" screen, the arrow keys also turn the LEDs on and off. With no other button pressed, the ⬆ arrow turns the LEDs on

and the 🎤 arrow turns them off. They can also be turned off or set to constantly stay on via the Set Up menu (see page 15).

Connectors and USB Port

The housing is machined out of solid aluminum alloy for a rugged, lightweight assembly.

The bottom of the unit contains the battery door latches and release tabs, along with the dock charging contacts.

Battery door release tabs

Dock charging contacts

The antenna attaches via SMA connector. The IR port is capped with a translucent window to broaden the reception angle. The input jack is a rugged, watertight 3-pin connector with a threaded locking sleeve.

SMA Connector **IR window** **Input Jack**

The battery compartment has a Gore-Tex® sealed vent.

* Gore-Tex is a registered trademark of W. L. Gore and Associates

The USB port, which is used for firmware updates, is located inside the battery compartment. When connected, the unit is powered from the USB source.

Attaching and Removing the Microphone

Align the ridges on the plug with the grooves in the jack and insert the plug.
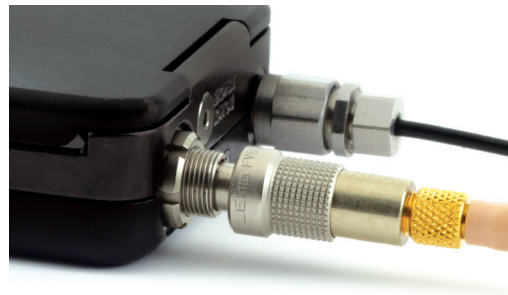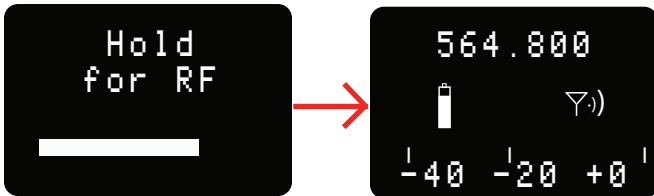

Slide the threaded sleeve onto the jack and rotate it clockwise to tighten it.

Rotate it counter-clockwise to remove it.

Operating Instructions

Powering On in Operating Mode

Press and hold the Power Button ⏻ for several seconds while"Hold for RF" appears and a bar indicator on the LCD progresses across the screen, returning to the Main Screen.

When you release the button, the unit will be operational with the RF output turned on and the Main Window displayed.

Powering On in Standby Mode

A brief press of the Power Button ⏻, releasing it before the progress bar is complete, will turn the unit on with the RF output turned off. The LCD will display a reminder that the RF output of the transmitter is turned off. **Standby Mode means no transmission.**
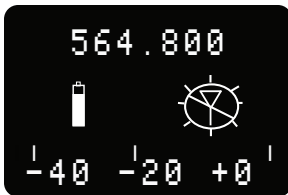
In this Standby Mode the frequency can be browsed to make adjustments without the risk of interfering with other wireless systems nearby.

After adjustments are made, press the Power Button again to turn the unit off.

Encryption Key Missing

A blinking <-KEY?-> below the Operating Mode Indicator shows that the Encryption Key is missing. Refer to page 14 for instructions on setting the Encryption Key.

The DSSM ships with the key type set as "Universal" and will work right away with any receiver also set to Universal Key Type.

Powering Off

To power off the unit, press and hold the Power Button ⏻ and wait for the bar counter to decrease fully.
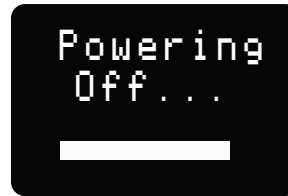
If the power button is released before the countdown is completed, the unit will remain turned on and the LCD will return to the same screen or menu that was displayed previously.

Setup Steps

The top level menus are accessed by powering the unit on, then pressing **MENU/SEL**. Refer to the **Setup Screens** section for details of each setup parameter.

The following list outlines the steps necessary to set up the transmitter for normal use.

1) Install a charged Lectrosonics LB-50 battery or retrieve the charged unit from the charging dock.

2) Set the compatibility mode to match the receiver to be used by pressing **MENU/SEL**, then scrolling to **COMPAT** and pressing **MENU/SEL** again to choose either D2 or HDM.

3) Adjust the frequency to match the receiver by using IR sync or use the menu system. Press **MENU/SEL** to open the Top Menu and choose XMIT, then Freq. Use the **UP** and **DOWN** arrow buttons to adjust the frequency in 1MHz steps. Press **MENU/SEL** to advance to the kHz setting and adjust as needed.

   The frequency is normally determined using the receiver to identify a clear channel in the operating spectrum. Refer to the receiver instructions for details on using features such as frequency scanning.

4) Connect the microphone or audio source to be used. Select the correct input configuration.

5) Adjust the input gain. Refer to the **Adjusting the Input Gain** section on the following page for instructions.

6) Turn on the receiver and verify that solid RF and audio signals are present (see receiver manual).

Locking the Controls

Front panel controls can be locked in the **SETUP** menu. Choose **Locked?** and the **UP** and **DOWN** arrow buttons use the arrow buttom to scroll down to **Locked?** Use the **UP** and **DOWN** arrow buttons to choose the Yes option. To unlock, choose No.

```
Setup                  Locked?
  AutoOn?
  Remote                 o Yes
▼ Locked?                ⊙ No
```
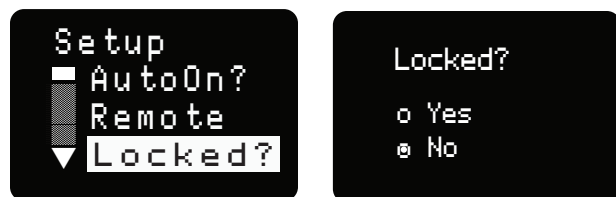
> NOTE: If the unit is Locked, you must unlock it to turn the power off. This setting prevents accidentally turning off the power when in use.

Adjusting the Input Gain

The two bicolor Modulation LEDs on the control panel provide a visual indication of the audio signal level entering the transmitter. 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

> NOTE: Full modulation is achieved at 0 dB, when the "-20" LED first turns red. The limiter can cleanly handle peaks up to 30 dB above this point.

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 or recorder during adjustment.

1) With a charged battery in the transmitter, power the unit on.

2) Press the **MENU/SEL** button to open the Top Menu. Choose **INPUT** then **GAIN**, to open the Gain menu.

3) Prepare the signal source. Position a microphone the way it will be used in actual operation and have the user speak or sing at the loudest level that occurs during use, or set the output level of the instrument or audio device to the maximum level that will be used.

4) Use the ⬆ and ⬇ arrow buttons to adjust the gain until the **–10 dB** glows green and the **–20 dB** LED starts to flicker red during the loudest peaks in the audio.

5) Once the audio gain has been set, the signal can be sent through the sound system for overall level adjustments, monitor settings, etc.

6) If the audio output level of the receiver is too high or low, use only the controls on the receiver to make adjustments. Unless the microphone or its position changes, or a different instrument is being used, leave the transmitter gain adjustment set according to these instructions. Use the audio output level control on the receiver to make adjustments for the desired level being delivered to the connected mixer, recorder, etc.

Menu Map

```
Input
```
→ MENU SEL →
```
Gain
```
→ MENU SEL →
```
Gain        ▲▼
             18
|-40 |-20 +0|
```
Use arrow buttons to increase or decrease gain
MENU SEL to select and return ↑ ↓ BACK

```
Rolloff
```
← MENU SEL ↓↑ →
```
Rolloff     ▲▼
    20 Hz
```
Scroll options with arrow buttons
MENU SEL to select and return ↑ ↓ BACK

Input Config. options are Instr, PSA, COS-11, Oth Lav, Line In, DPA, MKE 2, Dynamic, B6, M152, Custom, and Line In

```
InpCfg
```
→ MENU SEL →
```
InpCfg
    Oth Lav
```
Scroll options with arrow buttons
MENU SEL to select custom settings ↑ ↓ BACK

```
Xmit
```
→ MENU SEL →
```
Freq.
```
→ MENU SEL →
```
Freq.       ▲▼
   567.200
   No Grp
```
Use arrow buttons to increase or decrease operating frequency or select tuning group
MENU SEL to select MHz, KHz or group ↑ ↓ BACK

TxPower options are 50, 35, 25, or 10 (4 mW in HD mode)

```
TxPower
```
← MENU SEL ↓↑ →
```
TxPower
       50 mW
```
Scroll option with arrow buttons
MENU SEL to select and return ↑ ↓ BACK

```
Rf On?
```
← MENU SEL ↓↑ →
```
Rf On?
  ○ Yes
  ● No
```
Toggle option with arrow buttons
MENU SEL to select and return ↑ ↓ BACK

```
Compat
```
→ MENU SEL →
```
Compat
  ● D2
  ○ HDM
```
Toggle option with arrow buttons
MENU SEL to select and return ↑ ↓

```
IR & Keys
```
→ MENU SEL →
```
Send Freq
```
→ MENU SEL →
```
Send Freq
Sync  --->
```
Use Up or Down arrows to initiate sync
MENU SEL to select and return ↑ ↓
```
IR
SYNC
OK
```

```
Send All
```
← MENU SEL ↓↑ →
```
Send All
Sync  --->
```
Use Up or Down arrows to initiate sync
MENU SEL to select and return ↑ ↓
```
IR
SYNC
OK
```

```
Get Freq
```
← MENU SEL ↓↑ →
```
Get Freq
Sync  --->
```
Use Up or Down arrows to initiate sync
to select and return ↑ ↓
```
IR
SYNC
OK
```

```
Get All
```
← MENU SEL ↓↑ →
```
Get All
Sync  --->
```
Use Up or Down arrows to initiate sync
to select and return ↑ ↓
```
IR
SYNC
OK
```

Key Type options are Universal, Standard, Shared, and Volatile.

```
Key Type
```
← MENU SEL ↓↑ →
```
Key Type
Standard
```
Scroll option with arrow buttons
MENU SEL to select and return ↑ ↓ BACK

This menu choice is only available if Standard, Shared, or, Volatile keys are used.

```
WipeKey?
● No
○ Yes
```
Toggle option with arrow buttons
MENU SEL to select and return ↑ ↓ BACK

Setup → MENU/SEL → Auto On? → MENU/SEL →
```
Auto On?
● No
○ Yes
```
Toggle option with arrow buttons
MENU/SEL to select and return ▲ ▼ BACK

MENU/SEL → Remote → MENU/SEL →
```
Remote
● Enable
○ Ignore
```
Toggle option with arrow buttons
MENU/SEL to select and return ▲ ▼ BACK

MENU/SEL → Locked? → MENU/SEL →
```
Locked?
○ Yes
● No
```
Toggle option with arrow buttons
MENU/SEL to select and return ▲ ▼ BACK

MENU/SEL → DispOff → MENU/SEL →
```
DispOff
● On
○ 30 sec
○  5 sec
```
Select option with arrow buttons
MENU/SEL to select and return ▲ ▼

MENU/SEL → LED Off → MENU/SEL →
```
Leds
● On
○ Off
```
Toggle option with arrow buttons
MENU/SEL to select and return ▲ ▼

MENU/SEL → Default → MENU/SEL →
```
Restore?
● No
○ Yes
```
Toggle option with arrow buttons
MENU/SEL to select and return ▲ ▼

MENU/SEL → About → MENU/SEL →
```
DSSM
 V2.08/2.01
 Blk: 941
```
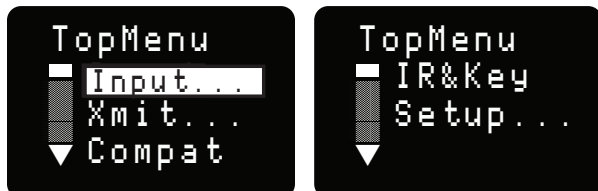MENU/SEL or BACK to go back
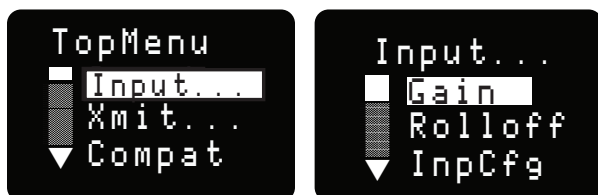
Menu Screen Details

Top Menu

From the Home screen, pressing **MENU/SEL** will access the Top Menu. The Top Menu allows the user to access the various sub-menus to change settings on the unit.

```
TopMenu
█ Input...
  Xmit...
▼ Compat
```
```
TopMenu
█ IR&Key
  Setup...
▼
```

Input Menu

From the TopMenu, use the ⬆ and ⬇ arrow buttons to highlight **INPUT** and press **MENU/SEL**.

```
TopMenu
█ Input...
  Xmit...
▼ Compat
```
```
Input...
█ Gain
  Rolloff
▼ InpCfg
```

Adjusting the Input Gain

The two bicolor Modulation LEDs on the control panel provide a visual indication of the audio signal level entering the transmitter. 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

> **NOTE:** Full modulation is achieved at 0 dB, when the "-20" LED first turns red. The limiter can cleanly handle peaks up to 30 dB above this point.

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 or recorder during adjustment.

1) With fresh LB50 batteries in the transmitter, power the unit on.

2) Navigate to the Gain setup screen.
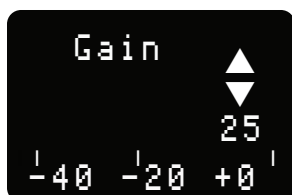
```
Gain        ▲
            ▼
            25
-40   -20   +0
```

3) Prepare the signal source. Position a microphone the way it will be used in actual operation and have the user speak or sing at the loudest level that will occur during use, or set the output level of the instrument or audio device to the maximum level that will be used.

4) Use the ⬆ and ⬇ arrow buttons to adjust the gain until the **–10 dB** glows green and the **–20 dB** LED starts to flicker red during the loudest peaks in the audio.

5) Once the audio gain has been set, the signal can be sent through the sound system for overall level adjustments, monitor settings, etc.

6) If the audio output level of the receiver is too high or low, use only the controls on the receiver to make adjustments. Always leave the transmitter gain adjustment set according to these instructions, and do not change it to adjust the audio output level of the receiver.

Selecting the Low Frequency Roll-off

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.

```
Input...
  Gain
█ Rolloff
▼ InpCfg
```
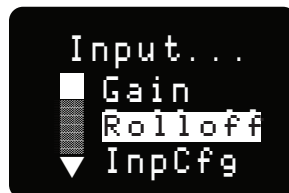
The -3 dB down point for the roll-off can be set to:
- 35 Hz
- 50 Hz
- 70 Hz
- 100 Hz
- 120 Hz
- 150 Hz

The roll-off is often adjusted by ear while monitoring the audio to minimize low frequency noise or rumble while leaving the desired sound unaffected.

Selecting Mic/Audio Input Configuration

Audio input can be selected by using the ⬆ and ⬇ arrow buttons to select the InpCfg from the Input Menu and pressing **MENU/SEL** to select your choice.

```
Input...
  Gain
  Rolloff
▼ InpCfg
```
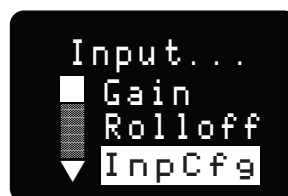
- Instr
- COS-11
- Line In
- MKE 2
- B6
- Custom
- PSA
- Oth Lav
- DPA
- Dynamic
- M152

The two types of high levels signals that can be used with the transmitter are:

- **Line** Used with line level outputs from recorders, mixers and other audio devices.

- **Instr:** (instrument) A special type of high impedance input with an active preamp for an optimal match with instrument pickups.

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