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E3200 User Guide – English Version

(Cover)

(Fit graphics of package front & copy to front cover)

(Inside Cover)

(Translations for user guide front copy)

(English Section)

(VERY BOLD “English” at top of each page within booklet. Consider black box with white Arial Black text)

3M™ Littmann® Electronic Stethoscope Model 3200 With Ambient Noise Reduction

Introduction

Congratulations and thank you for choosing the 3M™ Littmann® Electronic Stethoscope Model 3200.

The Model 3200 brings you the very latest in advanced auscultation and wireless electronics technology in a highly ergonomic and easy-to-use format.

The Model 3200's combination of Ambient Noise Reduction technology, frictional noise dampening materials, electronic amplification (conventional bell / diaphragm modes plus an “extended” mode), Bluetooth data transfer, and an all-new user interface takes you to the next level of performance and ease of use.






Whether you are auscultating infant, pediatric or adult patients, in quiet or noisy environments, or picking up difficult-to-hear heart and body sounds, you'll appreciate the technology that's been built into this latest electronic stethoscope bearing the Littmann® brand.

Don't miss the sounds you need to hear!


SAFETY INFORMATION

Please read, understand, and follow all safety information contained in these instructions prior to using this electronic stethoscope. Retain these instructions for future reference.

Explanation of Safety Related Labels and Symbols

	<p>Indicates Type B Equipment: The equipment provides protection against electrical shock and electrical current leakage. Applied parts are considered to be the complete chestpiece with diaphragm and binaural.</p>
	<p>Consult instructions for use.</p>
<p>IPX4</p>	<p>Protected against splashing liquid (chestpiece only).</p>
	<p>This product contains electrical and electronic components and must not be disposed of using standard refuse collection. Please consult local directives for disposal of electrical and electronic equipment.</p>
	<p>This product and packaging does not contain natural rubber latex.</p>
	<p>Indicates Category AP Equipment. Tested for use with flammable anesthetic mixture with air.</p>

Explanation of Signal Word Consequences

<p> CAUTION:</p>	<p>Indicates a hazardous situation, which, if not avoided, could result in minor injury and/or property damage.</p>
<p>NOTICE:</p>	<p>Indicates a hazardous situation, which, if not avoided, may result in property damage.</p>

 **CAUTION**

- **To reduce the risks associated with infection** follow all cleaning and disinfecting instructions included in this manual. Establish and follow a cleaning and disinfecting schedule.
- **To reduce the risks associated with very strong electromagnetic fields** avoid using the stethoscope near strong radio frequency signals or portable and/or mobile RF devices. If you hear sudden or unexpected sounds, move away from any radio transmitting antennas.
- **To reduce the risks associated with sharp edges** make sure that the soft sealing eartips are snapped firmly into position as shown in this manual. Use only Littmann replaceable eartips.
- **To reduce the risks associated with an incorrect result** store and operate this stethoscope only as instructed in this manual. As there is no acoustic (non-amplified) mode available with this stethoscope, replace the battery within two hours of the battery life icon beginning to flash in the LCD display. Replace battery with only type AA. Also, do not immerse the stethoscope in a liquid or subject it to any sterilization processes.
- **To reduce the risk associated with an electrical shock** do not use the stethoscope on patients without the stethoscope's diaphragm cover in place

NOTICE

- **The Model E3200 Electronic Stethoscope contains a Bluetooth wireless data link.** This radio frequency data link operates at a frequency of 2.4 GHz using GFSK modulation and with a maximum transmit power of 230 microwatts (0.000230 watts). The maximum radio frequency field strength generated by the stethoscope is below three volts per meter, a level that is considered safe to use with other medical devices. However, if electromagnetic interference is encountered due to the Bluetooth wireless data link, immediately move the stethoscope away from that device and/or turn the Bluetooth feature OFF.
- **To reduce the risks associated with environmental contamination** follow applicable regulations when disposing of this stethoscope. Properly dispose of, or recycle, spent batteries.
- **No modification of this equipment is allowed.** Use only authorized 3M service personnel to repair this stethoscope. Read, understand, and follow all the safety information on the battery package.

EMC Compliance

FCC Intentional Radiator Certification

3M Littmann Electronic Stethoscope Model 3200

FCC ID: DGFIPD3200

This equipment contains an intentional radiator approved by the FCC under the FCC ID numbers shown above. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

NO MODIFICATION: Modifications to this device shall not be made without the written consent of the 3M Company. Unauthorized modifications may void the authority granted under Federal Communications Commission rules permitting the operation of this device.

Industry Canada radio frequency rules and regulations

IC: 458A-IPD3200

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

EMC compliance Europe

This equipment complies with the EMC requirements of the IEC 60601-1-2.

Intended Use

The 3M™ Littmann® Electronic Stethoscope Model 3200 is intended for medical diagnostic purposes only. It may be used for the detection and amplification of heart, lungs, arteries, veins, and other internal organs with the use of selective frequency ranges. It can be used on any person undergoing a physical assessment.

Operator Profile

The 3M Littmann® Electronic Stethoscope Model 3200 is designed to be used by anyone who wishes to listen to sounds as described in the Intended Use section above. This manual provides complete information on how to operate the Model 3200 so that no additional operating training is required.

Functional Description

The Model 3200 electronic stethoscope picks up sounds, such as heart and lung sounds, from a patient's body. After amplification and filtering, the sounds are sent to the user through a binaural headset. The stethoscope chestpiece is designed for use with adult, pediatric, and infant patients.

The user interface for the stethoscope includes a 5-button keypad and an LCD display. Sound processing is carried out with the aid of a digital signal processor. Stethoscope power is provided by a single AA battery in the chestpiece. A power management system is included to prolong battery life. Using its Bluetooth wireless link, the stethoscope can exchange audio data with an external device such as a personal computer (PC).

Serial Number

Each Littmann Electronic Stethoscope Model 3200 comes with a unique serial number for easy identification. Please record your serial number in this manual for future reference: _____

INSTRUCTION FOR USE

1. Insert Battery

Insert AA battery (provided in package) into Stethoscope.

	<p>1. Hold chestpiece in one hand while slightly twisting the battery cap approximately 25° counter-clockwise. Remove battery cap.</p>
	<p>2. Insert new battery with positive end out (plus sign will be visible in the battery compartment)</p>
	<p>3. Remount battery cap, twisting cap approximately 25° clockwise until locked.</p>
	<p>4. Make sure the two marks are aligned</p>

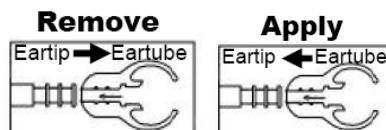
2. Position Headset

Eartips should point in a forward direction as you insert them into your ear canals. When ear tips are properly positioned, diaphragm will face towards your body.



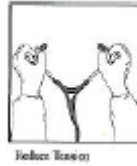
Your new Littmann Electronic Stethoscope is designed to give you a very comfortable, acoustically sealed fit. It comes with two sizes of eartips to assure a perfect fit. The large eartips are pre-installed. Smaller eartips are included in package. Please choose the set that is most comfortable for you.

To remove eartips, pull eartips firmly away from eartube. To apply new eartips, push eartip firmly onto eartube to secure.



3. Adjust Headset for Comfort

To **reduce spring tension** in the headset, hold each eartube at the bend near the eartips and gradually pull apart until fully extended (180 degrees).



To **increase spring tension**, grasp the headset with one hand where the metal eartubes enter the plastic tubing, and squeeze until the plastic tubing on one eartube touches the other. Repeat as necessary.



4. Turn On / Off

This stethoscope comes equipped with an advanced power management system.

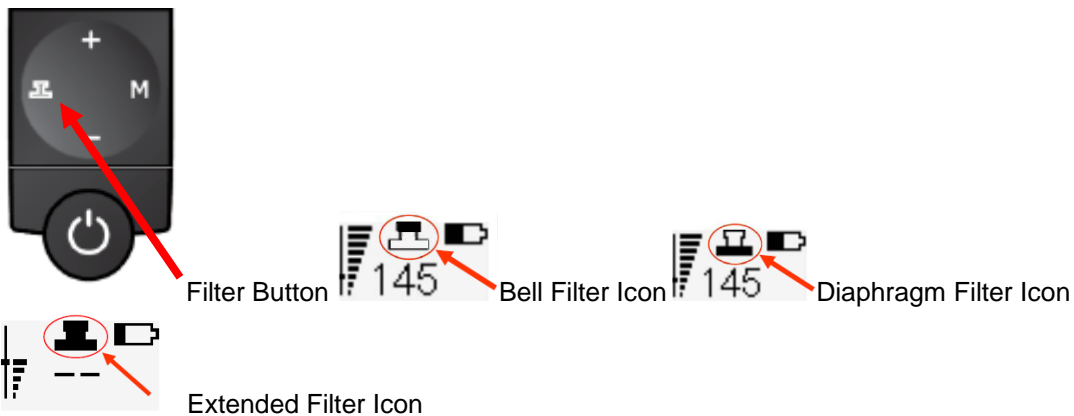


- **Manual Turn On:** Depress and release power button. LCD display will activate, indicating stethoscope is on.
- **Manual Turn Off:** Depress and **hold** power button for two seconds. LCD display will shut off, indicating stethoscope is off.
- **Auto-on with Standby Feature:** After manual turn-on, stethoscope will stay on during use, but switch to a power-saving standby mode after 10 seconds of inactivity. LCD display will display the Littmann® logo during “standby mode.” When stethoscope diaphragm or any button is pressed, LCD display settings will reappear and stethoscope will be ready to use. After 30 minutes of non-use, stethoscope will leave “standby mode” and fully power down. You may customize on-time and off-time to meet your own personal needs. See **Custom Configuration** section below.
- **LCD Display Backlight:** Backlight options are available for use at low ambient light levels. By default, depressing and releasing the power button at any time (“on demand”) will illuminate the LCD display for 3 seconds.

5. Select Filter

This stethoscope comes equipped with three filters: bell (low frequency), diaphragm (high frequency), and “extended” (overlap of bell and diaphragm filters). The default setting is the diaphragm filter. Instructions for changing the default filter setting are given in the **Custom Configuration** section below.

To select filter: Depress and release filter button (as shown in diagram) until desired filter mode appears on the LCD display.



6. Adjust Sound Amplification Level

The Model 3200 sound level can be amplified in 8 increments up to 24X amplification of a non-electronic (cardiology-level) stethoscope. Level 1 is equal to a non-electronic stethoscope. Level 9 is equal to 24X amplification of a non-electronic stethoscope. The greater the amplification, the more bars you will see.

A default start-up amplification level can be set using the instructions provided in the **Custom Configuration** section below. The default setting is marked by the box on the vertical bar shown in the volume icon in the LCD display. The illustration shows a default amplification setting at Level 3.

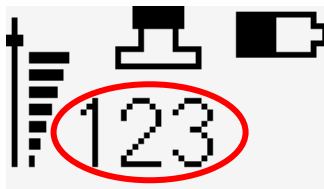


- **Increase Amplification:** Press (+) button until desired amplification level is achieved
- **Decrease Amplification:** Press (-) button until desired amplification level is achieved

7. Monitor Patient Heart Rate

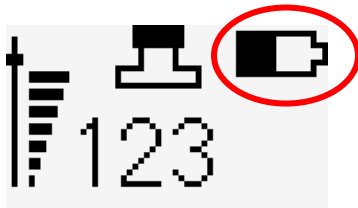
The Model 3200 detects and displays an acoustic-based heart rate when presented with consistent heart sounds (heart rate variation < 10%). It takes five seconds to compute the initial heart rate and updates are provided every two seconds. Prior to the initial reading, the display shows two dashes (--). For heart rates outside a range of 30-199 bpm, the display will also show two dashes (--).

The acoustic-based heart rate display functions best when the Model 3200 is placed near the apex of the patient's heart. If the heart rate changes from consistent to inconsistent or if there is excessive ambient noise, patient movement or lung sounds during auscultation, the heart rate display number will display two dashes (--).



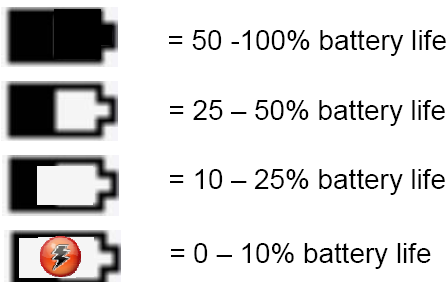
8. Monitor Battery Life

Battery life is indicated by an icon in the LCD display.



The Model 3200 comes with a AA Alkaline battery. Battery will provide approximately 50-60 hours of continuous use, depending on the frequency of Bluetooth data transfers. In a typical clinical setting, this represents about three months.

As the battery life depletes, the icon will change as follows:



The battery icon begins to blink when only a few hours of battery capacity remains.

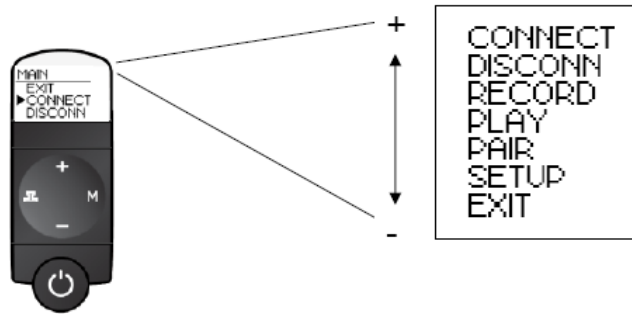
CAUTION: When the battery is completely depleted the scope becomes inoperable. No sound will be transmitted without a functioning battery.

IMPORTANT! NiMH (rechargeable) and Lithium batteries may also be used in the Model 3200. However, battery type must be specified to ensure a reliable battery life indication (see **Custom Configuration** section below).

9. Custom Configuration

The Model 3200 stethoscope has several operational settings that can be changed using its configuration menu system. Within this menu system, the (+) and (-) buttons are used for scrolling and the (M) button is used for selecting options. The Filter button acts as an “escape” key, used for returning to the previous menu or to the operating mode of the stethoscope.

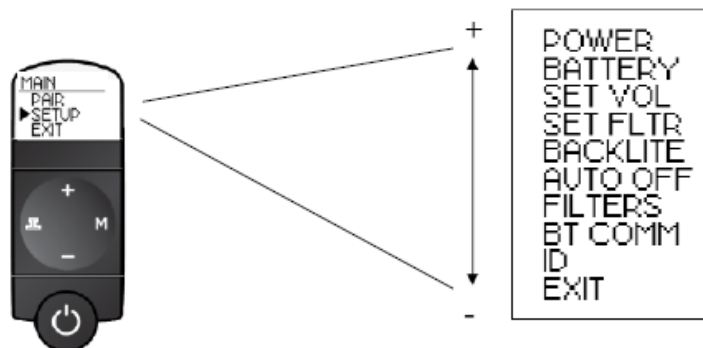
To access the Main menu: Depress and release the (M) button. The “Main” menu will be displayed, with the CONNECT option highlighted (NOTE: Only 3 options will be visible at a time. All options can be viewed in sequence upon scrolling with either the (+) or (-) buttons):



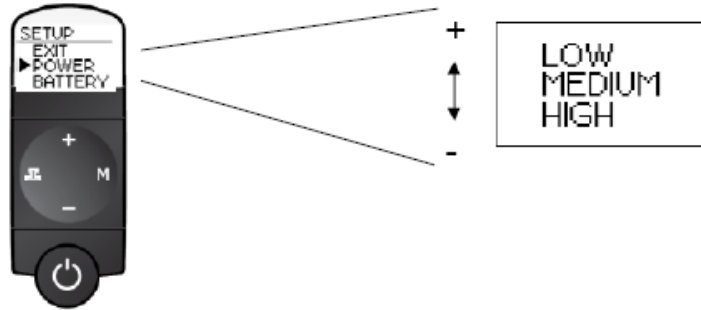
To leave the Main menu: Use the (M) button to select the “EXIT” option. This will return the stethoscope to its normal operating state.



To enter the Setup Menu: Use the (-) button to scroll down the list of Special Functions until “SETUP” is highlighted. Select the Setup option by pressing and releasing the (M) button. This will display the following menu:



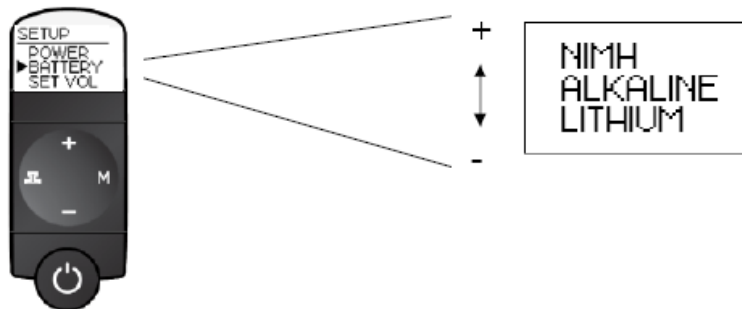
To set Power: Select the “POWER” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of power settings. Press and release the (M) button to select a setting.



The power settings provide different degrees of power consumption. In general, the longer the stethoscope remains in an active mode, the greater its power consumption. The factory default is the LOW level. (NOTE: The Auto Off power management feature is further described below)

Power Level	Auto Off enabled			Auto Off disabled		
	Low	Medium	High	Low	Medium	High
Power On Time	10 sec	20 sec	30 sec	3 min	5 min	7 min
Power Off Time	30 min	2 hr	5 hr	30 min	2 hr	5 hr
Backlight	3 sec	5 sec	5 sec	3 sec	5 sec	5 sec

To specify the battery type: Select the “BATTERY” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of battery types. The LITHIUM battery is a non-rechargeable cell especially recommended for low-temperature operation of the stethoscope. The NIMH battery is rechargeable (external charger required). Press and release the (M) button to select a setting. The factory default is the ALKALINE battery.



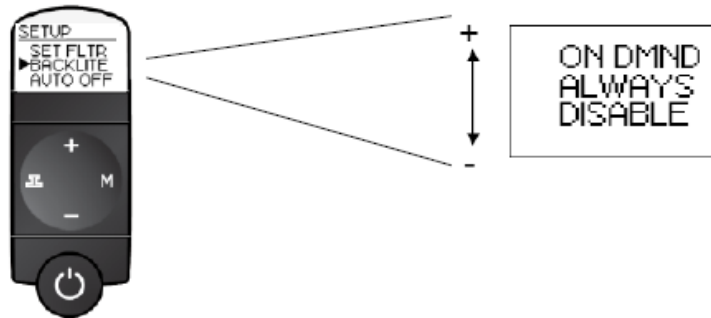
To specify the preset (default) volume level: Select the “SET VOL” option in the Setup menu. Press and release the (M) button to select the current volume level as default. The factory default is level 3.



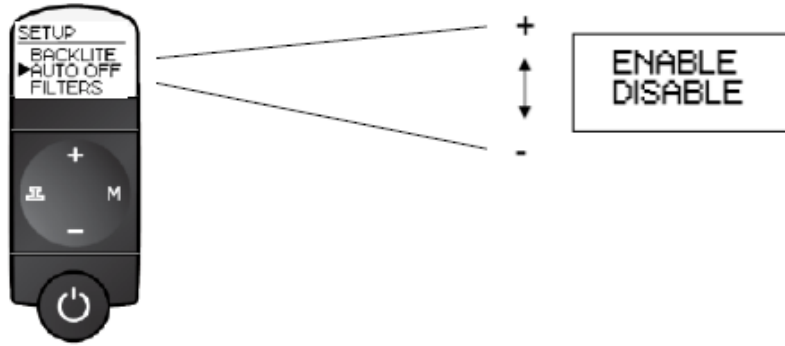
To specify the preset (default) filter setting: Select the “SET FLTR” option in the Setup menu. Press and release the (M) button to select the current filter as default. The factory default is the diaphragm filter.



To specify Backlighting duration: Select the “BACKLITE” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of options. Press and release the (M) button to select. The factory default is “ON DMND” (Backlight will illuminate for three seconds by depressing and releasing the power button). The “DISABLE” option disables the backlight at all times and will conserve power. The “ALWAYS” option will illuminate the backlight at all times at a reduced level while the stethoscope is powered on and not in standby mode.

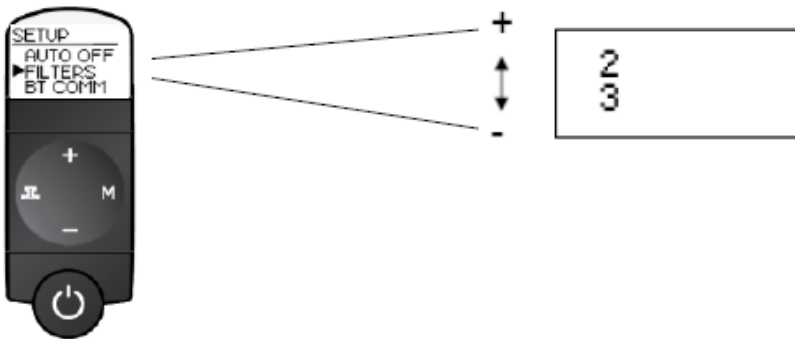


To select Auto Off power management: Select the “AUTO OFF” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of options. Press and release the (M) button to select. The factory default is “ENABLE”.

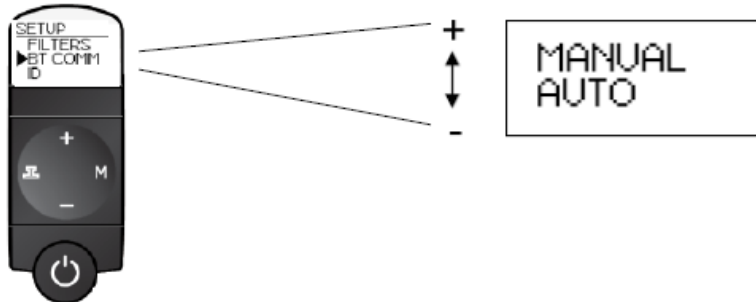


The Auto On feature powers on the stethoscope from its standby mode when contact is detected with the diaphragm. With the Auto Off feature, power is turned off when user activity is no longer detected (the stethoscope returns to its standby mode after a delay equal to the Power On time.)

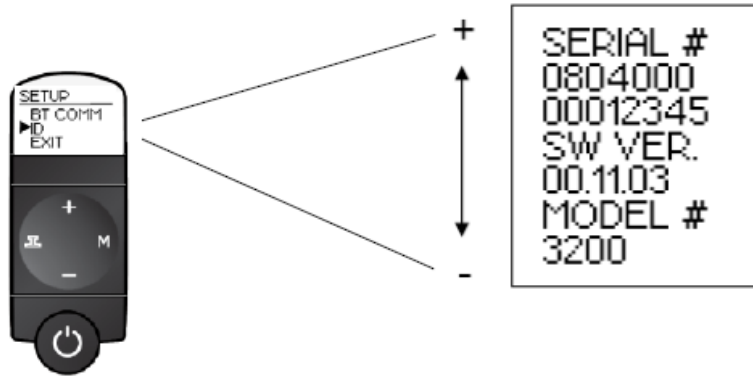
To set number of frequency ranges: Select the “FILTERS” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of options. Option “2” supports toggling between two filters (bell and diaphragm) with the FILTER button. With option “3” the FILTER button cycles the stethoscope through each of three filter modes (bell, diaphragm, and extended). Press and release the (M) button to select. The factory default is three filters.



To specify Bluetooth mode: Select the “BT COMM” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of options. The MANUAL option means that the Bluetooth link can be used for data transfers but requires user activation. The AUTO option means that the Bluetooth link is powered whenever the stethoscope is in an active mode. Press and release the (M) button to select an option. The factory default is “MANUAL.”



To obtain model and software version information: Select the “ID” option in the Setup menu. Use the (-) and (+) buttons to scroll through the list of reference numbers. Press “M” to return to the operating mode of the stethoscope.



To leave the Setup menu: Use the (M) button to select the “EXIT” entry and return to the operating mode of the stethoscope.



11. Using the Bluetooth Interface

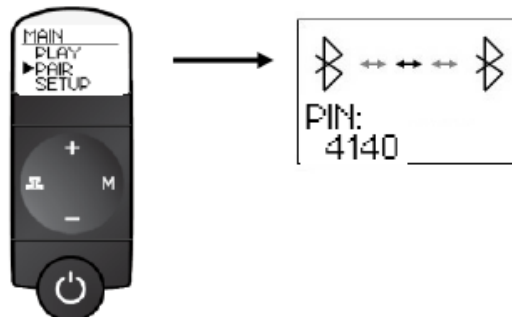
The Bluetooth interface provides a means of exchanging audio data with external devices such as a Bluetooth-enabled PC. Audio data can be sent in near real time, permitting their visual presentation, recording, and analysis by applications software complying with communication protocols used by the Model 3200 stethoscope.

IMPORTANT! The Model 3200 uses a Class 2 Bluetooth link, with a maximum range of 10m.

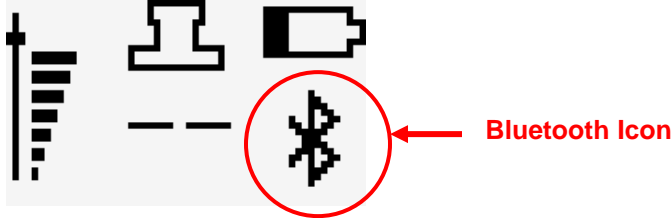
In order to transfer data between two Bluetooth devices, they must be “paired” electronically. This requires user operations to be performed on both devices. The Model 3200 can be paired with up to 8 devices at a time. However, it cannot pair with a second Model 3200 stethoscope.

How to pair the Model 3200 with an external device:

- 1. Initiate pairing process:** Depress and release the (M) button. The LCD backlight will come on and the MAIN menu will be displayed. Use the (-) button to scroll down the list of Actions until “PAIR” is highlighted. Select this option by pressing and releasing the (M) button. The LCD screen will signal that pairing is in progress with the following animated display:



2. **Select Model 3200 stethoscope on external Bluetooth device:** Consult application software for details, process may vary by computer platform utilized. If pairing is successful, the LCD display of the Model 3200 will show a flashing Bluetooth icon and the stethoscope will be ready for wireless operations.

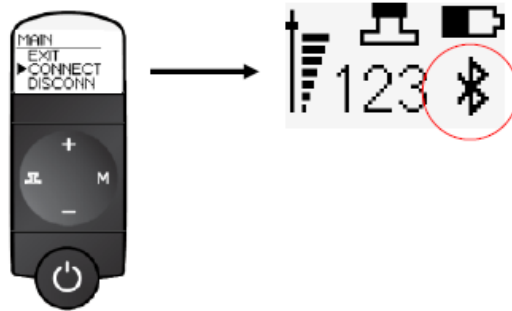


If the Bluetooth connection with the external device is subsequently lost or times out, the Bluetooth icon will disappear from the LCD display.

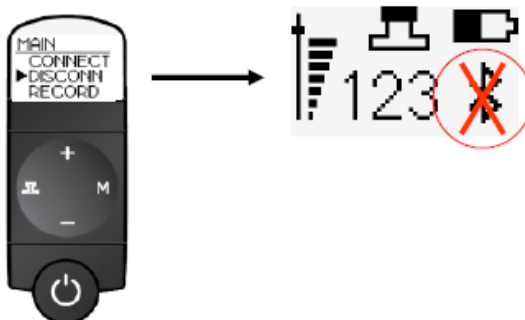
When connected by a Bluetooth link, external, Bluetooth-enabled devices can take control of the display and keypad of the Model 3200 stethoscope. They can also transfer audio (ex. voice prompts) to the Model 3200 headset. During audio transfers to the stethoscope, a tone will be sounded every 8 seconds.

How to transfer real-time data to an external device:

1. Ensure the Model 3200 is paired with the external device.
2. Depress and release the (M) button. The LCD backlight will come on and the MAIN menu will be displayed with the "CONNECT" option highlighted. Select this option by pressing and releasing the (M) button. The LCD screen will signal that the Bluetooth link is active. The stethoscope will automatically return to operational status.



A Bluetooth connection with the stethoscope will automatically be ended if no data transfers occur in a 90 second period. Alternatively, they can be manually ended using the "DISCONN" (disconnect) option of the Main menu.

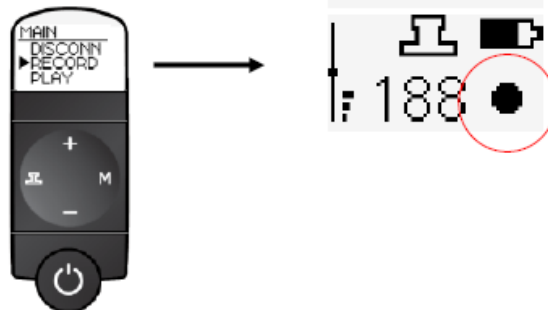


12. Using Onboard Recording

Onboard recording provides a means to acquire and play an auscultation sound track. This track can be uploaded to an external device using the Bluetooth link and the software accompanying the Model 3200 stethoscope.

How to record a sound track:

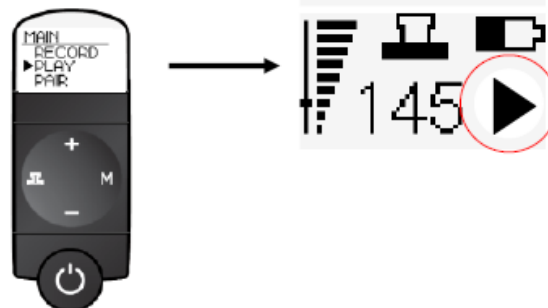
1. **Enter the recording mode:** Depress and release the (M) button. The “MAIN” menu will be displayed. Use the (-) button to scroll down the list of options until “RECORD” is highlighted.
2. **Begin the recording:** Depress and release the (M) button. The stethoscope will start recording and the LCD screen will show a “recording” icon.



3. **End the recording:** Depress and release the (M) button. The stethoscope will stop recording and the recording icon will disappear from the LCD display. If the time between the beginning and ending of the recording session is greater than 29 seconds, only the last 29 seconds will be saved.

How to play back a sound track:

1. **Enter the playback mode:** Depress and release the (M) button. The LCD backlight will come on and the MAIN menu will be displayed. Use the (-) button to scroll down the list of options until “PLAY” is highlighted. Select this option by pressing and releasing the (M) button. The LCD screen will show a “PLAY” icon and the sound track will “loop” continuously.



2. **End playback:** Depress and release the (M) button. The stethoscope will stop playing the sound track and will return to its previous operational mode.

Uploading a sound track to an external device:

1. **Prepare the external device to receive the sound file.** Start the Model 3200 software program on the external device.
2. **Initiate a Bluetooth connection with the Model 3200.** Use the same procedure as described above for initiating real-time data transfers to an external device.

3. **Return to operating mode:** When transmission of the sound track is complete, the Bluetooth link to the external device can be disconnected and the Model 3200 will return to its previous operating mode.

13. Other Operating Considerations

Operating range is -22° to 104°F (-30° to 40°C), 15 to 93% relative humidity.
Storage and transport range is -40° to 131° F (-40° to 55°C), 15 to 93% relative humidity.

To extend the life of your stethoscope, avoid extreme heat, cold, solvents and oils. Remove the battery whenever the stethoscope will not be used for several months.

If you plan to use the stethoscope below 0°F (-18°C) you should use a lithium battery to insure proper function.

Failure to follow care and maintenance recommendations could result in damage to the internal components of the Littmann Electronic Stethoscope. Internal damage could cause malfunction of the product, ranging from a slight decrease in auditory response to complete failure of the product.

If you experience any problems with the electronic stethoscope, do not attempt to repair it yourself. Please notify our 3M Health Care Service Center for directions on shipping and receiving.

MAINTENANCE & WARRANTY

Cleaning

Cleaning of stethoscope should be done between each patient use.

Cleaning the Chestpiece

Under normal conditions, it is unnecessary to remove the diaphragm for cleaning. The diaphragm can easily be cleaned by using an alcohol wipe. If however, it is necessary to remove the diaphragm, carefully follow the instructions below:

- **Diaphragm Removal:** With diaphragm side up, using a thumbnail, lift the underside portion of the diaphragm out of its designated groove, and peel it off of the chestpiece. The groove that holds the diaphragm in place can be cleaned by sliding the edge of an alcohol swab around the groove. All parts of the chestpiece can be wiped down with alcohol. **IMPORTANT:** The stethoscope should not be immersed in any solution. Excess liquid used in the cleaning process may result in moisture getting into the internal components.
- **Diaphragm Reassembly:** Once the diaphragm is completely dry, insert the diaphragm into the groove of the rim, starting at one point, and run your finger around the diaphragm until it is seated back in the groove.

Cleaning Other Parts of the Stethoscope

Eartips, eartubes, plastic tubing and chestpiece can be wiped clean with alcohol. Eartips may be removed for a more thorough cleaning.

***NOTICE:* Do not immerse the stethoscope in any liquid or subject it to any sterilization process!**

Service & Warranty Program

Your Littmann Electronic Stethoscope comes with the finest service and warranty policy in the industry. The Littmann Electronic Stethoscope Model 3200 is warranted against any defects in material and manufacture for a period of two years. If a material or manufacturing defect is discovered during the warranty period, repairs will be made without charge upon the return of the instrument to 3M, except in cases of obvious abuse or accidental damage.

For Maintenance or Repair Services

Please include your name, physical address, e-mail address, and phone number inside with your stethoscope.

In the U.S.A., send your stethoscope directly to:

3M Health Care Service Center
3M Bldg 502-1W-01
3350 Granada Ave N
Suite 200
Oakdale, MN 55128
1-800-292-6298

In Canada, send your stethoscope directly to:

3M Health Care Service Centre
3M Canada, Inc.
80 Enterprise Drive South
London, Ontario
Canada, N6N1C2
1-800-563-2921

Outside of the U.S.A. and Canada, contact your local 3M subsidiary for maintenance and repair information.


APPENDIX

Declaration – Electromagnetic Emissions		
The 3M Littmann® Electronic Stethoscope, Model 3200, is intended for use in the electromagnetic environment specified below. The customer or the user of the Model 3200 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment –guidance
RF emissions CISPR 11	Group 2	Model 3200 must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.
RF emissions CISPR 11	Class B	Model 3200 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Not applicable	

Declaration – electromagnetic immunity			
The 3M Littmann® Electronic Stethoscope, Model 3200, is intended for use in the electromagnetic environment specified below. The customer or the user of Model 3200 should assure that it is used in such an environment			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for supply lines ± 1 kV for input/output lines	Not applicable	
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	Not applicable	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial magnetic field or hospital environment
Voltage dips, short interruptions and voltage variations on power supply lines IEC 61000-4-11	< 5 % UT (>95 % dip in UT) for 0.5 cycle 40 % UT (60 % dip in UT) for 5 cycle 70 % UT (30 % dip in UT) for 25 cycle < 5% UT (>95 % dip in UT) for 5 sec	Not applicable	

Declaration – electromagnetic immunity - continued

The 3M Littmann® Electronic Stethoscope, Model 3200, is intended for use in the electromagnetic environment specified below. The customer or the user of Model 3200 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	Not applicable	Portable and mobile RF communications equipment should be used no closer to any part of the Model 3200 , including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 1,2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.5 GHz	$d = 1,2 \sqrt{P}$ 80 MHz to 800 MHz $d = 2,3 \sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, ^a should be less than the compliance level in each frequency range, ^b Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Model 3200 is used exceeds the applicable RF compliance level above, the Model 3200 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Model 3200.

^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the 3M™ Littmann® Electronic Stethoscope Model 3200

The Model 3200 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Model 3200 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Model 3200 as recommended below, according to the maximum output of the communications equipment.

Rated maximum output power of transmitter, P [W]	Separation distance according to frequency of transmitters, d [m]		
	150 kHz to 80 MHz	80 Mz to 800 MHz $d = 1,2 \sqrt{P}$	800 MHz to 2,5 GHz $d = 2,3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Revision History

<<Document History>>