**3M**

Littmann®
Brand

Electronic Stethoscope
MODEL 4100
with Ambient Noise Reduction

4100

AMPLIFY _AND_ RECORD THE SOUNDS YOU WANT TO HEAR WITH LESS DISTRACTING AMBIENT NOISE

- Amplification up to 18 times greater than the best conventional Littmann stethoscopes

- Reduction of unwanted ambient noise by up to 75%

- Recording and playback capability

- Playback capability at normal or half-speed

- Easy to switch between frequency modes: bell, diaphragm, and extended range

- Heart rate display

- Versatile chestpiece can accommodate infant, pediatric and adult patients

- Uses two AAA batteries

Featuring **Ambient Noise Reduction**
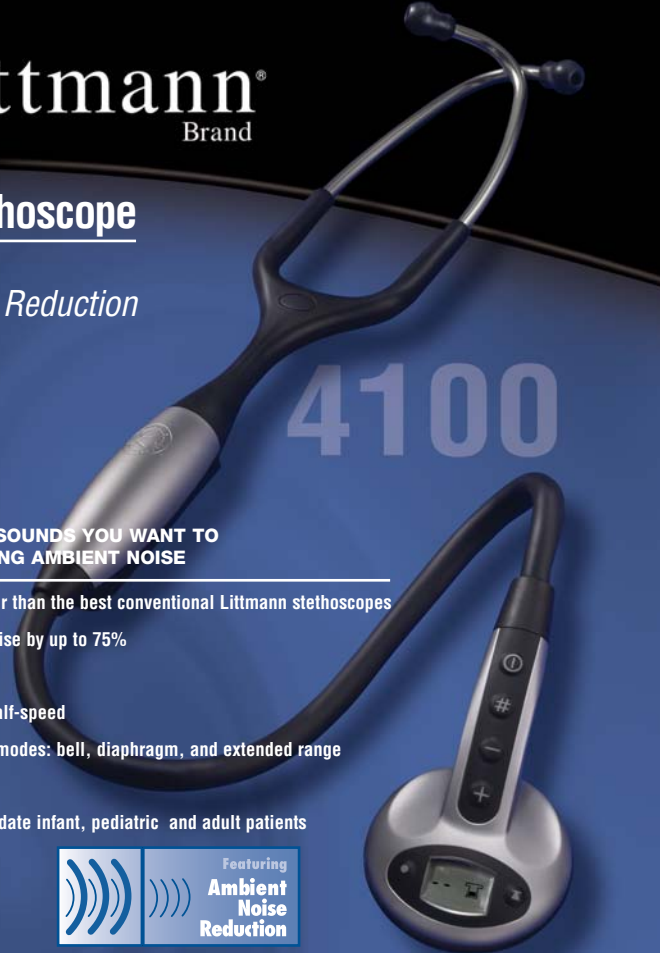
3M™ Littmann® Electronic Stethoscope Model 4100

Congratulations on the purchase of your new Littmann Electronic Stethoscope Model 4100, the next generation electronic stethoscope that offers the very latest in advanced auscultation technology and now features ambient noise reduction technology (patent pending) that reduces up to 75% of distracting room noise.

This powerful, state-of-the-art electronic stethoscope provides superior acoustics. With amplification up to 18 times greater than the best conventional stethoscopes, the Model 4100 is specially designed to pick up difficult-to-hear heart and other body sounds without amplifying sounds you don't want to hear.

Three frequency modes are available for optimal heart and lung auscultation: Bell, Diaphragm and Extended Range.

The Model 4100 offers recording, storage and playback capabilities using six separate soundtracks. Instant playback is available at normal and half speed. Additionally, the Model 4100 provides infrared data transmission of recorded sounds to another Model 4100, an IBM-compatible PC, Pocket PC, or Palm Pilot, giving you the option of sharing or storing the sounds.

Other features include digital signal processing over the entire acoustic range, built-in display for easy viewing of the heart rate, patient-friendly nonchill diaphragm with a proprietary, low friction surface, and patented 3M™ Littmann® Snap Tight Soft-Sealing Eartips for excellent acoustic seal and comfortable fit. Plus, the Model 4100 operates on just two AAA alkaline batteries.

Most of all, know that the Model 4100 carries the Littmann brand name, the name known worldwide for unsurpassed quality. As a trusted leader in auscultation technology, the Littmann brand of stethoscopes is your assurance of acoustic superiority, innovative design and exceptional performance.

The following symbols are applicable to this device:

⚠ • Attention, see instructions for use.

🧍 • Indicates Type B Equipment: The equipment provides protection against electrical shock and electrical current leakage.

IP X4 • Protected against splashing liquid (chestpiece only).

(LATEX) • This product and package do not contain natural rubber latex.

Each Littmann Electronic Stethoscope Model 4100 has a serial number beginning with "SN T".

Indications

The Littmann Electronic Stethoscope Model 4100 is intended for medical diagnostic purposes only. It can be used for the amplification of heart, lung and other body sounds with selective frequency filtering. The Model 4100 can also be used for recording, playback and transmitting/receiving of heart, lung, and other body sounds. This product is not designed, sold, or intended for use except as indicated.

⚠ Caution:

• Stethoscope not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

• Failure to follow directions, general use, and maintenance recommendations could result in damage to the device or possible injury to the user. Damage could cause malfunction of the product, ranging from a slight decrease in auditory response to complete failure of the product.

• Half speed playback is for reference and should not be the only basis for diagnosis.

• It is the responsibility of the clinician to assure that all recordings and data transmissions correspond to the appropriate patient data.

• Transmissions of soundtracks to a computer are for storage purposes only.

• Soundtracks should not be listened to from a computer for diagnostic purposes.

• The Littmann Electronic Stethoscope Model 4100 has been tested to be resistant to both electromagnetic fields (EMI) and electrostatic discharge (ESD). However, it may be susceptible to very strong RF signals or portable and/or mobile RF devices. When using your stethoscope, if you hear sudden or unexpected sounds, you may be in close proximity to a strong radio transmitter. If this should occur, move away from the radio's transmitting antenna.

• Use only AAA alkaline batteries.

• The Model 4100 will not function if the batteries are depleted.

• Do not immerse the stethoscope in any liquid or subject it to any sterilization processes. The entire Model 4100 can be wiped clean with alcohol.

• At the end of this device's useful life, dispose or recycle in accordance with your local, state, and governmental regulations.

• If you have any problems with the Model 4100, do not attempt to repair it yourself. Refer to the Service and Warranty section of this manual.

Instructions for Use
Battery

When used in a typical setting, the Littmann Electronic Stethoscope Model 4100 will operate for about one month on two AAA alkaline batteries. Using the recording options or infrared data transfer will reduce the average battery life.

When the batteries are close to depletion, the LOW BATTERY indictor, located on the display, will blink. When this occurs, the batteries should be replaced within two hours of continuous use.

When the batteries are no longer able to power the Model 4100 stethoscope, the stethoscope will automatically turn off. All recorded sounds and settings are saved. The Model 4100 will not function if the batteries are depleted.

Insert batteries as shown

Battery Compartment
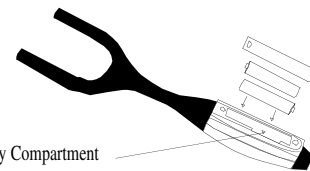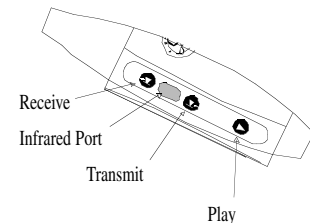
Electronic Controls

The chestpiece of the Littmann Electronic Stethoscope Model 4100 contains six buttons.

On / Off
Soundtrack Selector
Volume Decrease
Volume Increase
Record
Frequency Mode Selector
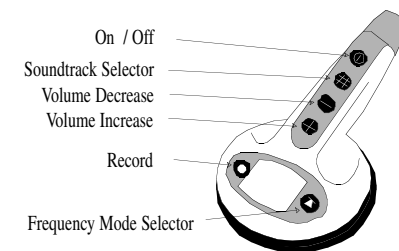
The battery compartment of the Model 4100 contains three buttons and the infrared port.

Receive
Infrared Port
Transmit
Play

Electronic Control Quick Reference

(Refer to Operation section for complete instructions)

|	
On/Off	Press the ON/OFF button to turn the stethoscope on. Press the ON/OFF button for approximately two seconds to turn the stethoscope off. Pressing the ON/OFF button cancels the current action, for example, to stop a playback, transmission, or reception of a soundtrack.
Soundtrack	There are six soundtracks available on the Model 4100.
Selector	Press the SOUNDTRACK SELECTOR button once to display soundtrack one, press again to advance to the next sound track.
Volume Decrease	Press the VOLUME DECREASE button to decrease the sound level.
Volume Increase	Press the VOLUME INCREASE button to increase the sound level.
Record	Press the RECORD button for one second to record sound onto the selected soundtrack. Press again to stop recording.
Frequency Mode Selector	Press the FREQUENCY MODE SELECTOR button to select Bell, Diaphragm or Extended Range.
Receive	Press the RECEIVE button to receive a soundtrack from another Model 4100 or computer.
Transmit	Press the TRANSMIT button to transmit the displayed soundtrack to another Model 4100, computer or handheld device.
Play	Press the PLAY button to hear the selected soundtrack. The display panel will indicate that

the playback is at normal speed. Press and hold the PLAY button for two seconds to play back in half speed. The display panel will indicate that the playback is at half speed. To return to normal speed, press the PLAY button again. Stop playback by pressing the ON/OFF button.

Display Panel
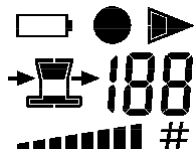
The above picture demonstrates the graphics that are used on the Model 4100 display panel. As a functional test, when the Model 4100 is turned on, all the graphic indicators as shown above will be briefly displayed. After this brief test, the display will then indicate the current listening mode and the volume setting. The factory setting for listening mode is Bell mode and a volume setting of level three.

If **Er** is shown on the display, refer to the Error Message section.

When the display panel shows: **It means:**

	Blinking means the two batteries are almost depleted.
	The sound volume has eight levels. The bar shows the current sound level, increasing from the left. The more bars visible, the higher the sound level. When one element is displayed, the sound level is similar to a typical acoustic stethoscope.

This is also used to indicate soundtrack reception or transmission progress during data transmission.

	Bell mode.
	Diaphragm mode.
	Extended range mode. The extended range amplifies sound from a broader range of frequencies than the bell or diaphragm mode.
	Playing a recorded sound at normal speed.
	Playing a recorded sound at half speed.
	Recording a sound.
	Transmitting a recording. The arrow will blink until the infrared connection is made. After connection is made, the arrow will no longer blink.
	Receiving a recording. The arrow will blink until the infrared connection is made. After connection is made, the arrow will no longer blink.
	The number displayed indicates the soundtrack currently selected.
	The symbol **U** indicates that the soundtrack is occupied by a previous recording. If **U** is not displayed, the soundtrack is vacant. When the **U** is rotating, a sound transmission is in progress. **#** is located below the number of the soundtrack you have selected.

	A number displayed is the heart rate. If two dashed lines are displayed, refer to the heart rate section
199	If the display is blinking 199, the heart rate is above 199 bpm and cannot be displayed.
	Error Message. See Error Message section of this manual.

Operation

Power On	Press the ON/OFF button on the Littmann Electronic Stethoscope Model 4100. The factory or personalized setting will be in operation.
Automatic Power Off	The Model 4100 automatically turns off three minutes after the last actuation of any button. Press the ON/OFF button within 10 seconds of automatic power off and the same settings will be restored. If longer than 10 seconds have transpired, the Model 4100 will power up at your personalized setting or factory setting. Note, the stethoscope will not power off automatically during a data transmission.
Change Sound Volume Level	Press the VOLUME INCREASE or VOLUME DECREASE button. The sound volume bar displays the change.
Change Frequency Mode	Press the FREQUENCY MODE SELECTOR button to select one of the frequency ranges (Bell, Diaphragm or Extended). The selection is indicated on the display panel.

Personalized Setup

The Model 4100 is factory set in bell mode and sound level 3. To personalize setup, select the desired frequency mode and volume level, and then press and hold the FREQUENCY MODE SELECTOR button for two seconds. The Model 4100 will now function with these settings on startup.

Heart Rate

The Model 4100 detects and displays an acoustic-based heart rate. It takes five seconds to compute the initial heart rate and is updated every two seconds. For heart rates below 30 bpm or before the initial reading, the display shows two dashes (--). Heart rates above 199 bpm will flash the number 199. Heart rate is not displayed during recording or playback.

The acoustic-based heart rate display functions best when the Model 4100 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 flash or display two dashes (--). The flashing heart rate will change to two dashes (--) after 10 seconds of inconsistent sounds or no heart rate detection.

Select Soundtrack

Select any one of the six soundtrack by pressing the SOUNDTRACK SELECTOR button one or more times. The selected soundtrack is displayed. A number shown by itself indicates an empty track. A number shown with the ∪ indicates a recorded soundtrack. Recording on a soundtrack that displays the ∪ will erase the currently stored sound.

Press the ON/OFF button to return to the heart rate display.

Recording

Press and hold the RECORD button for one second. The record symbol will flash in the display. Press the record button again to stop recording. Wait for approximately two - three seconds after an auscultation event before pressing the RECORD button to stop recording. Each soundtrack has a recording duration of eight seconds. Each recording must be at least two seconds in duration.

The recording process captures the full frequency range and stores it on the soundtrack. This allows the ability to change the frequency mode from bell, diaphragm or extended range during playback. To ensure that clear auscultation sounds are captured, do not adjust volume or frequency mode during recording.

Playback

To play back a recording, select the desired soundtrack and press the PLAY button. When the entire soundtrack has been played, there is a one second delay before the soundtrack will play again. To end playback, press the ON/OFF button.

Half Speed Playback

Press and hold the PLAY button for two seconds. To stop the continuous half speed and return to normal playback, press the PLAY button. To end playback, press the ON/OFF button.

Erase Single Soundtracks

Erase soundtracks by recording new sounds onto them. Erased soundtracks cannot be recovered.

Erase All Sound tracks (use with caution)

Press and hold the SOUNDTRACK SELECTOR button for tw seconds. This will erase all soundtracks. Erased soundtracks cannot be recovered.

Data transmission to another Littmann Electronic Stethoscope Model 4100

1. Select the soundtrack to be transmitted and the soundtrack to receive the transmission.

2. Position the two IR ports within two feet.

3. Press the RECEIVE button on the receiving Model 4100 then press the TRANSMIT button on the transmitting Model 4100. The arrow will blink until the infrared connection is made.

4. Transmission is indicated on the Model 4100 display by a rotating ∪.

5. Progress of the transmission is shown on the Model 4100 display with the ▬▬■■■■■■ symbol. To stop the transmission, press the ON/OFF button on either stethoscope.

Sending a copy of a soundtrack to a computer using Microsoft® Windows® 98/2000/XP [1] with an infrared (IR) port

1. Select the soundtrack to be transmitted.

2. Position the two IR ports within two feet.

3. Press the Model 4100 TRANSMIT button. The arrow will blink until the infrared connection is made.

4. Transmission is indicated on the Model 4100 display by a rotating ∪. The computer status bar will display two red lights flashing towards one another.

5. Progress of the transmission is shown on the Model 4100 display by the ▬▬■■■■■■ symbol.

6. WINDOWS 98 – Downloaded soundtracks are stored in: C:\My Received Files.

   WINDOWS 2000 – Downloaded soundtracks are stored in: C:\Documents and Settings\username\Desktop and appear on the desktop.

7. The soundtrack filename format is: 'Trk*.e4k' (* is the soundtrack number on the stethoscope)

   Example: soundtrack 2 = 'Trk2.e4k'

   If the default soundtrack filename already exists, a new name, "Copy of Trk*.e4k" or "Copy # of Trk*.e4k" is given, example: soundtrack 2 = "Copy of Trk2.e4k" (# is the number of duplicates from the same soundtrack)

   It is advisable to rename the soundtrack files once they are transmitted to avoid confusion. It is not necessary to maintain the file extension *.e4k.

If **Er** appears in the display of the stethoscope, refer to the Error Messages section of this manual to determine a possible cause.

Receiving a copy of a soundtrack from a computer using Microsoft® Windows® 98/2000/XP[2] with an infrared (IR) port

WINDOWS 98 - From the Start menu select 'Start – Programs – Windows Explorer'. Open the folder "My Received Files" and locate the soundtrack file to be transmitted.

WINDOWS 2000 – From the desktop (or within the folder that contains the soundtrack file to be transmitted) locate the soundtrack file to be transmitted.

1. Select the Model 4100 soundtrack to receive the transmitted file.

   Caution: If the selected soundtrack contains a recording, the transmitted file will replace it. Erased soundtracks cannot be recovered.

2. Position the two IR ports within two feet.

3. Press the Model 4100 RECEIVE button. The arrow will blink until the infrared connection is made.

4. Immediately right click on the soundtrack file to be transmitted and select 'Send To – Infrared Recipient'

5. Transmission is indicated on the Model 4100 display by a rotating ⊔. The computer status bar will display two red lights flashing towards one another.

6. Progress of the transmission is shown on the Model 4100 display with the ◄━━■■■■■ symbol.

The Model 4100 is compatible with the following handheld computer operating systems:

Pocket PC operating systems 2002, 2003; Palm™ Pilot operating systems 4 and 5.

Palm Pilot operating systems 4 and 5 must have a proper FILE MANAGER installed that is set-up to accept .e4k file extension, to work.

(UniCMD can be used for beaming and for accepting .e4k files on Palm Pilots. Remember to set-up UniCMD to accept .e4k files and use the 'Send' command to transmit from the PDA. Note that UniCMD stores the files in an application-specific format, which is not directly usable from other applications on the PDA. Example: Using UniCMD for accepting .e4k files and using FileZ for beaming the received files will not work, as the files transmitted and received will not be the same (file is modified with additional bytes).

Sending a Copy of Soundtrack to Handheld Device from Model 4100:

1. Select sound track to be transmitted.

2. Position the two infrared (IR) ports within two feet of each other.

3. Press the Model 4100 transmit button. The ⊔ will rotate until the file is transferred.

4. When handheld asks you to accept file, click on yes.

5. Progress of file transfer is shown on the Model 4100 display with the Ψ symbol.

6. The transferred file name format is Trk*.e4k, (the soundtrack number on the stethoscope).

7. Repeat steps 1 through 6 for additional track transfers.

Receiving a Copy of Soundtrack on Model 4100 from Handheld Device

1. Open up file manager program on handheld device and identify which file you want to transfer.

2. Align Model 4100 and handheld IR ports within two feet of each other.

3. Press receive button on Model 4100.

4. Send file from handheld to Model 4100.

5. Transmission of the file is indicated on the Model 4100 display by a rotating ⊔.

6. Progress of file transfer is shown on the Model 4100 display with the Ψ symbol.

Transferring Sound Track from Handheld device to PC

1. To transfer sound track to your PC from a handheld device:
   a. Align IR ports within 2 feet of each other.
   b. Open file manager program on handheld and identify which file you want to transfer.
   c. Send file from handheld to PC.
   d. Accept file on PC.

   OR

2. To transfer sound track to your PC from a handheld device you can simply dock your handheld device and let your PC handheld software (e.g. Microsoft® Active Sync) transfer files for you. Once transferred, you can use standard PC file manager to move and rename files as desired.

Transferring Sound Track from PC to Handheld Device

1. To transfer sound track from your PC to handheld device:
   a. Open file manager program on PC and identify which file you want to transfer.
   b. Align IR ports within 2 feet of each other.
   c. Send file from PC to handheld.
   d. Accept file on handheld.

   OR

2. To transfer sound track from your PC to your handheld device you can simply locate file you want to transfer, put it into correct directory on your PC and then dock your handheld device. Let your PC handheld software (e.g. Microsoft Active Sync) transfer files for you. Once transferred, you can use standard handheld file manager to move and rename files as desired.

   Note: The soundtrack filename is not transmitted to the stethoscope. If appears in the display of the stethoscope, refer to the Error Messages section of this manual to determine a possible cause.

Error Messages

If Er shows while transmitting data to another Model 4100 or a computer:

• The path of infrared light may be blocked. Position the infrared ports at each other and retry the operation.

• The infrared port may be dirty. Clean both infrared ports.

• The Model 4100 was removed before the soundtrack was completely transferred. Do not move the stethoscopes until the ⊔ is finished rotating.

• The Model 4100 may be exposed to excessive electromagnetic or radiofrequency interference (EMI/RFI). Remove the source of noise.

If none of these issues is the cause of the Er message, refer to the Littmann Stethoscope Service and Warranty section.
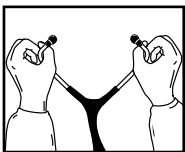
Headset Positioning

Your new Littmann Electronic Stethoscope Model 4100 is designed to give you a very comfortable, acoustically sealed ear fit. Notice that the eartubes are permanently set at an angle to accommodate the typical anatomy of the ear canal. The eartips should point in a forward direction as you insert them into your ear canals.

**Correct**
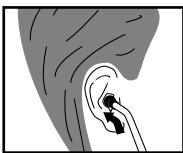
Incorrect

Reduce Tension

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

Increase Tension

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

For maximum acoustic performance, comfortable patented Littmann Soft-Sealing Eartips are provided with your stethoscope.
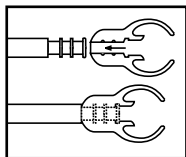
The stethoscope utilizes a unique design for attaching the eartip to the eartube. The eartips are pushed on to the end of the eartube and snapped tight. To remove, pull firmly on the eartip.

Additional Littmann eartips are available. To order, contact your Littmann Stethoscope distributor or the 3M Health Care Service Center.

Cleaning of the Diaphragm:

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 can 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.

Other Considerations

- The entire stethoscope can be wiped clean with alcohol.
- Do not immerse the stethoscope in any liquid or subject it to any sterilization process.
- Eartips can be removed for a thorough cleaning.
- Remove the battery whenever the stethoscope is stored or will not be used for several months.
- Avoid extreme heat, cold, solvents and oils. Recommended normal storage conditions are from 32˚F to 122˚F (0˚C to 50˚C), 15 to 95% relative humidity.

Failure to follow care and maintenance recommendations could result in damage to the internal components of the Model 4100. 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 Model 4100 do not attempt to repair it yourself. Please notify the 3M Health Care Service Center for directions on how to return the product for repair.

Littmann Stethoscope Service and Warranty Program

The Littmann Electronic Stethoscope Model 4100 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 technical questions, call the 3M Health Care Tech Line at 1-800-441-1922.

For maintenance or repair services in the United States, send your stethoscope directly to:
3M Health Care Service Center
3M Building 502-1W-01
3350 Granada Ave N
Suite 200
Oakdale, MN 55128
1-800-292-6298

Enclose your name, address, phone number and reason for repair with your stethoscope.
In Canada:
3M Health Care Service Center
3M Canada Inc.
80 Enterprise Drive South
London, Ontario
Canada N6N1C2
1-519-668-3663

Outside of the United States and Canada, contact your local 3M subsidiary for maintenance and repair information.

Appendix

Operating conditions

Temperature:	0ºC - 50ºC
Humidity:	0% - 95% RH
Pressure:	700 – 1060 hPa

Short-term storage (up to 96hrs)

Temperature:	-20ºC - 60ºC
Humidity:	0% - 95% RH
Pressure:	700 – 1060 hPa

Normal storage conditions

Temperature:	0ºC - 50ºC
Humidity:	0% - 95% RH
Pressure:	700 – 1060 hPa

Table 201

Declaration – Electromagnetic Emissions

The 3M Littmann® Electronic Stethoscope, Model 4100, is intended for use in the electromagnetic environment specified below. The customer or the user of the Model 4100 should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The Model E4100 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The Model E4100 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/flicker emmisions IEC 61000-3-3	Not applicable	

Table 202

Declaration – Electromagnetic Immunity

The 3M Littmann® Electronic Stethoscope, Model 4100, is intended for use in the electromagnetic environment specified below. The customer or the user of Model 4100 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	
Voltage dips, short interruptions and voltage variations on power supply lines IEC 61000-4-11	< 5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycle 70 % U_T (30 % dip in U_T) for 25 cycle < 5% U_T (>95 % dip in U_T) for 5 sec	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.

Table 204

Declaration – Electromagnetic Immunity (Continued)			
The 3M Littmann® Electronic Stethoscope, Model 4100, is intended for use in the electromagnetic environment specified below. The customer or the user of Model 4100 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment –guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the Model 4100, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
			Recommended separation distance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	Not applicable	$d = 1.2 \sqrt{P}$
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 Model 4100 is used exceeds the applicable RF compliance level above, the Model 4100 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 4100.

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

Table 206

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the 3M™ Littmann® Electronic Stethoscope Model 4100			
The Model 4100 is intended for use in the electromagnetic environment in which the RF disturbances are controlled. The customer or the user of the Model 4100 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Model 4100 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.