SMART SOUND

Document Information

Doc. Title	SKEEPER USER MANUAL FOR R1
Doc. No.	UM-R1
Rev. No.	0

Revision History

Rev.No	Rev. Date	Change Description
0	2024.01.11	Initial release

1. INTENDED USE

The Skeeper is an electronic stethoscope that collects, filters, and amplifies the sound of a person's heart, lungs, and abdomen. It is intended for use by professional users in clinical environments or by lay users in non-clinical environments. It is not intended for self-diagnosis.

2. INTENDED USER

It is intended for use by professional users in clinical environments or by lay users in non-clinical environments.

3. SAFETY INFORMATION

Failure to comply with safety information can interfere with measurements or create dangerous conditions.

Note!!

Read the user manual and safety information carefully before using the device

Measuring on your skin or thin clothes

- The sound volume or the location of the measurement position may vary by the measurement environments or physical characteristics (chest size, obesity, muscle, fat or others).

Holding and selecting the proper location for measurement

- If not corrected, this can or may give an error of measurement results.
- If not heard the heart, lung, or other vital signal sound well, find and move the location where you can hear clearly.

Measuring in a comfortable condition

- Do not measure in hot or cold environments.
- Maintain a stable posture while measuring (The default setting time is 20 seconds, which can be selected every 5 seconds from 10 to 60 seconds for heart and lung measurement).
- Do not measure immediately after smoking, drinking, alcohol, exercise, or coffee (caffeine).

Measuring in the quiet place

- Background noise can be interfered with accurate measurement.
- If noisy, stop and measure again.
- Do not speak or talk on the phone while measuring.
- Measure in a quiet place where there is no ambient noise (TV, music, pets, telephone rings, vacuum cleaners, washing machines, Children's voice, etc.).

Do not change the device position during measurement.

- If you cough suddenly or drop the device, stop and measure again.
- If you speak or move while measurement, the noise can be mixed.
- For the high accuracy of measurement, please follow the instructions of manual.

Incorrect or improper use may occur damage your hearing.

- Do not listen loudly.

- Do not listen for a long time.

If communication is delayed or connection is not available, please re-run the Skeeper and Skeeper app. If the problem continues, please contact SMARTSOUND's service center.



Caution

Failure to comply with safety cautions and regulations can cause injury or property damage.
Do not use your device near other electronic devices

- Skeeper may receive electromagnetic interference from other electronic devices near you or may affect other electronic devices. If such a problem occurs during use, use it away from other electronic devices or turn off the power of unnecessary electronic devices.

Charging rating

- The power supplied to the cable for charging the Skeeper should be 5.0V/2.0A.
- This Skeeper does not provide an adapter. The adapter uses a certified universal USB adapter.

Do not use your device in automotive equipment that can be interfered with by radio frequency

- On an aircraft, using electronic devices can interfere with the aircraft's electronic navigational instruments. Make sure the device is turned off during takeoff and landing. After takeoff,
- you can use the device if allowed by aircraft personnel.

Do not expose the device to heavy smoke or fumes

- Doing so may damage the outside of the device or cause it to malfunction.

If you use a hearing aid, contact the manufacturer for information about radio interference

- The radio frequency emitted by your device may interfere with some hearing aids. Before using your device, contact the manufacturer to determine whether your hearing aid will be affected by radio frequencies emitted by the device.
- This device is an electronic device. There may be electromagnetic interference from other electric devices (TV, PC and others) nearby. If a problem occurs, move this device away from it, or use it after stopping the operation of nearby electronic devices

Do not use your device near devices or apparatuses that emit radio frequencies, such as sound systems or radio towers

- Radio frequencies may cause your device to malfunction or to produce incorrect measurement results.

Turn off the device in potentially explosive environments

- Turn off your device in potentially explosive environments instead of removing the battery.
- Always comply with regulations, instructions, and signs in potentially explosive environments.
- Do not use your device at refueling points (petrol stations), near fuels or chemicals, or in blasting areas.
- Do not store or carry flammable liquids, gases, or explosive materials in the same compartment as the device, its parts, or accessories.

If you notice strange smells or sounds coming from your device or the battery, or if you see smoke or liquids leaking from the device or battery, stop using the device immediately and

contact A/S Center

- Failure to do so may result in fire or explosion.

Comply with all safety warnings and regulations regarding mobile device usage while operating a vehicle

- While driving, safely operating the vehicle is your first responsibility. Never use your device while driving if it is prohibited by law.

Use caution in environments with RF-emitting devices.

- The Skeeper may malfunction due to devices that generate proximity radio frequencies such as RFID readers. Therefore, please turn off the Skeeper or keep it as far away as possible when using RFID devices.
- Medical devices that emit RF, such as MRI and electrosurgical systems, can cause the Skeeper to malfunction, so should turn off the Skeeper or move it away from these devices.
- The Skeeper may be affected by WPT and 5G communication environments. Please use the Skeeper away from devices that emit such RF whenever possible.
- The Skeeper can be caused to malfunction by RF emitted by metal detectors and electromagnetic anti-theft systems (EAS). Please turn off the power of SKEEPER in these systems.



Warning

The device does not operate while the device is being charged. Do not use while charging.

Failure to comply with safety warnings and regulations can cause serious injury or death Do not use damaged power cords or plugs, or loose electrical sockets

- Unsecured connections can cause electric shock or fire.

Do not touch the power cord with wet hands or disconnect the charging cable by pulling the cord

- Doing so may result in electrocution.

Do not bend or damage the power cord or charging cable

- Doing so may cause electric shock or fire.

Do not use your device while it is charging or touch your device with wet hands

- Doing so may cause electric shock.

Do not use your device outdoor during a thunderstorm

- Doing so may result in electric shock or device malfunction.

Using SMARTSOUND-approved batteries, charging cable, accessories, and supplies

- Using generic batteries or charging cable may shorten the life of your device or cause the device to malfunction. They may also cause a fire or cause the battery to explode.
- Use only SMARTSOUND-approved battery and charging cable specifically designed for your device. Incompatible battery and charging cable can cause serious injuries or damage to your device.
- SMARTSOUND cannot be responsible for the user's safety when using accessories or supplies that are not approved by SMARTSOUND.

Do not disassemble, modify, or repair this device

- To prevent voiding the warranty, do not disassemble or modify the device and its accessories. If any part of the device does not work properly, contact A/S Center.
- SMARTSOUND is not responsible for any damage, loss, injury, or accident that occurs during disassembly, modification, repair or other improper operation.

Do not drop, throw, bend or cause an impact to the charging cable or the device Handle and dispose of the device and charging cable with care

- Never dispose of the battery or device in a fire. Never place the battery or device on or in heating
- devices, such as stoves, microwave ovens, radiators, or others. The device may explode when overheated. Follow all local regulations when disposing of used battery or device.
- Never crush or puncture the device.
- Avoid exposing the device to high external pressure, which can lead to an internal short circuit and overheating.

Protect the device, battery and charging cable from damage

- Avoid exposing your device and battery to very cold or very hot temperatures.
- Extreme temperatures can damage the device and reduce the charging capacity and life of your device and battery
- The batteries included in Skeeper should only be replaced by SMARTSOUND service personnel. Batteries that have been replaced by improper personnel may present a hazard of excessive heat generation, fire, or explosion.

Do not share earphones

- For earphones to be used for Skeeper, check the material of the earphone cap and use earphones made of material that does not have allergic reactions, etc.
- Earphones or headphones should be your own. If you use earphones with other users, there is a hazard of cross-infection.
- When connecting earphones or headphones, please push the connector all the way in. Incorrect connection may cause no sound or noise.

When connecting the charger, please connect it all the way to the connector. If the connection is not correct, charging may not be possible or there may be a hazard of fire or explosion.

- Prevent the battery from coming into contact with metal objects, as this can create a connection between the + and – terminals of your battery and lead to temporary or permanent battery damage.
- Never use a damaged charging cable or battery.

Do not store your device near or in heaters, microwaves, hot cooking equipment, or high pressure containers

- The battery may leak.
- Your device may overheat and cause a fire.

Do not use or store your device in areas with high concentrations of dust or airborne materials

- Dust or foreign materials can cause your device to malfunction and may result in fire or electric shock.

Prevent the multipurpose jack and the small end of the charging cable from contact with conductive materials, such as liquids, dust, metal powders, and pencil leads

- Conductive materials may cause a short circuit or corrosion of the terminals, which may result in an explosion or fire.

Do not bite or suck the device or the battery, especially baby, child, and pet

- Doing so may damage the device or result in an explosion or fire.
- Children or animals can choke on small parts.

- If children use the device, make sure that they use the device properly.
- If children under thirteen years of age are not admitted without a parent or guardian.

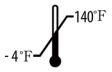
Do not insert the device or supplied accessories into the eyes, ears, or mouth

- Doing so may cause suffocation or serious injuries.

Do not handle a damaged or leaking Lithium-ion (Li-Ion) battery

For safe disposal of your Lithium-ion (Li-Ion) battery, please contact A/S Center

Symbol Information

Symbol	Indication
	This symbol identifies a safety note. Ensure you understand the function of this control before using it. Control function is described in the appropriate User's or Service Manual.
	Type BF applied part
	To indicate that separate collection for waste electric and electronic equipment (WEEE) is required
	Refer to instruction
	Humidity limitation for transportation
	Atmospheric pressure limitation for transportation
	Temperature limitation for transportation
	Keep DRY
	Manufacturer
	Date of manufacture
	WEEE Symbol - EU only Disposal of your old appliance When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2012/19/EU. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.
	QR code
	DC current
	SN Marking
	To indicate this product is Medical device

Care and use your device properly

Keep your device dry

- Humidity and liquids may damage the parts or electronic circuits in your device.
- Do not turn on your device if it is wet. If your device is already on, turn it off immediately (if the device will not turn off). Then, dry the device with a towel and contact A/S Center.
- Do not use the device, if you or your clothes is wet.
- Do not wash, rinse or soak the device.

Store your device only on flat surfaces

- If your device falls, it may be damaged.

Do not store your device with metal objects, such as coins, keys, and necklaces

- Your device may be scratched or may malfunction.
- If the battery terminals come into contact with metal objects, this may cause a fire.

Do not store your device near magnetic fields

- Your device may malfunction, or the battery may discharge from exposure to magnetic fields.

Do not use your device or applications for a while if the device is overheated

- Prolonged exposure of your skin to an overheated device may cause low temperature burn symptoms, such as red spots and pigmentation.

Protect your hearing and ears when using an earphone or headset

- Excessive exposure to loud sounds can cause hearing damage.
- In dry environments, static electricity can build up in the headset. Avoid using headsets in dry environments or touch a metal object to discharge static electricity before connecting a headset to the device.
- Do not listen at any volume that causes you discomfort.
- Recommend using a woofer / high performance bass earphone or headsets to listen the better health sound.

Do not use while walking or moving and speaking

Do not use in a noisy or vibrating place

Do not use the device if it is cracked or broken

- Broken parts could cause injury to your hands and face. Contact A/S Center to have it repaired.

Do not drop your device or cause impacts to your device

- Your device may be damaged or may malfunction.
- If bent or deformed, your device may be damaged, or parts may malfunction.

Ensure maximum battery and charging cable life

- Avoid charging your device for more than a week, as overcharging may shorten battery life.
- Over time, the unused device will discharge and must be recharged before use.
- Disconnect the charging cable from power sources when not in use.
- Use the battery only for their intended purposes.
- Leaving batteries unused over time may reduce their lifespan and performance. It may also cause the batteries to malfunction or explode or cause a fire.
- Follow all instructions in this manual to ensure the longest lifespan of your device and battery. Damages or poor performance caused by failure to follow warnings and instructions can void your manufacturer's warranty.
- Your device may wear out over time. Some parts and repairs are covered by the warranty within the validity period, but damages or deterioration caused by using unapproved accessories are not.

Do not disassemble, modify, or repair your device

- Any changes or modifications to your device can void your manufacturer's warranty. If your device needs servicing, contact A/S Center.

Specific Absorption Rate (SAR) certification information

This device meets international guidelines for exposure to radio waves.

- The device is a radio transmitter and receiver. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) recommended by international guidelines.
- FCC No.: 2ADIYR1

  The 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 undesired operation.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

MRI SAFETY INFORMATION

The Skeeper is MR Unsafe. The device presents a projectile hazard.

4. SPECIFICATION

Size (W X L X H)		149.66 x 60.33 x 37.38 mm (WxLxH, mm) 5.89" x 2.38" x 1.47" (WxLxH, inch)	
Weight		145g	
External Interface type		USB-C type	
Sensor Type		MEMS MIC	
Battery	Type	Rechargeable Lithium-Polymer	
	Output	3.7 Vd.c., 1600mAh	
	Recharging Time	Approx. 1.5 Hours	
	Hour of Battery Use	Approx. 4 Hours (Measurement)	
Protection		Internally powered Type BF Applied Part	
		IP24	
Environment	Storage and Transportation conditions	Temperature	-10℃~60℃
		Humidity	10%~80%RH
		Pressure	700~1060hPa
	Operating conditions	Temperature	0℃~40℃
		Humidity	30%~60%RH
		Pressure	700~1060hPa
Performance	Response frequency range by mode	Heart Mode	50~300 Hz
		Lung Mode	100~1200 Hz
		Abdomen Mode	60~400 Hz
		Extension Mode	50~2000 Hz
	Maximum Sound Level	100 dB(A)	
	Heart rate measurement accuracy	+/- 1 BPM	
Wireless Communication		WiFi	802.11 b/g/n 2.4G
		Bluetooth	4.1
		Distance	10M

5. COMPONENT AND APPERANCE

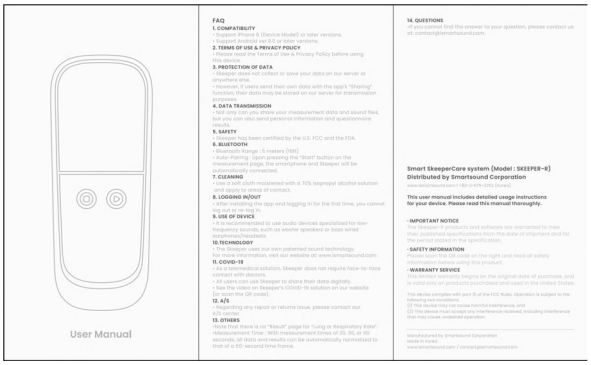
<COMPONENTS>



[본체]

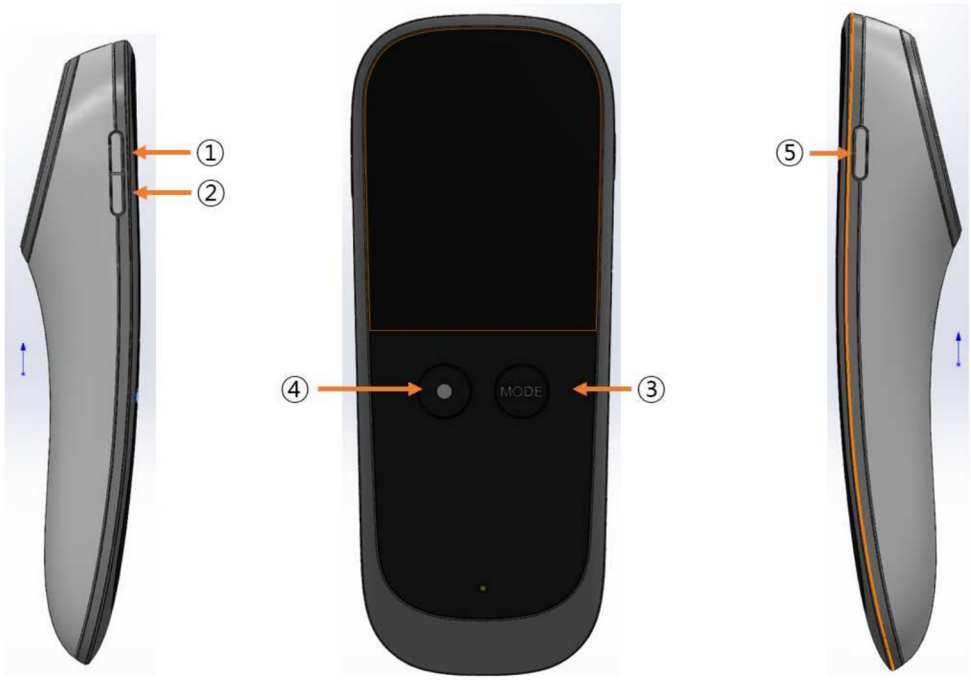


[크래들]



[매뉴얼]

<APPERANCE>



No	key Function	Operating Methods
	Volume + / -	. Adjust the volume: “+” (Volume Up), “-” (Volume Down)

① ②		· Volume adjustments can be heard as short beeps through the earphones, and two beeps indicate the volume has reached its maximum/minimum.
	Up / Down Buttons	· Keys for up and down moving on UI list or icons
③	Mode	· Go to the stethoscope screen if it's not on the stethoscope screen · Switch to stethoscope mode for a stethoscope screen · Heart > Lung > Abdomen > Fetus sound circulation · Disable function during auscultation recording.
④	Record	· Start/Stop recording if on a stethoscope screen
⑤	Power	· Press and hold to Power On/Off · If you press it briefly, sleep/wake up

6. HOW TO USE

PREPARATION FOR USE

POWER ON/OFF

Turn the power On/Off by pressing the power button.

❶ Power On

The power button must be pressed for at least 3 seconds to power on.

LCD display will be turned on after booting animation, followed by the home menu screen(which is the default mode).

The product is now ready for use.

❷ Power Off

To turn off the power, press the power button for more than 1.5 seconds and show the pop-up bar with the 3 kins of menu as power off, restart and screen shot.

LCD display will be turned off with shut down animation and then the power will be turned off.

PREPARATION FOR MEASUREMENT

CHARGING

Before initial use of the product, or when it has not been used for an extended period of time, it is recommended to charge the product fully before use.

❶ Connect the USB charging cable, which is included in the product package, to the product's charging USB connector.

❷ The Blue LED should be turned on when charging. The green LED should be turned on when charging is completed.

It takes approximately 180 minutes to fully charge.

The product can be continuously used for approximately 15 hours when fully charged.

Use a certified charger for safe use of the product

Even when the product is not in use for an extended period, charge it regularly(at least once every 3 months) in order to avoid completely depleting the battery.

PREPARATION FOR CONNECTION

APP DOWNLOAD & BLUETOOTH CONNECTION

❶ Search “Skeeper” (full name in English) at mobile app market (App Store, Play Store, etc.).

Skeeper app is available for the following OS versions.

Android Version	9 or higher
iOS Version	8 or higher

❷ Download and install app by selecting “Install” on app guide page.

❸ Activate your smart device’s Bluetooth and turn on the Skeeper.

Note! Do not manually pair the Skeeper with the app. It should connect automatically on the measurement page.

❹ Launch the app and enter your ID and password

When you first launch the app, you must set ID and PW.

ID	Set an ID of 2~8 characters including alphabetic characters, numbers only. (Not allowed any special characters)
PW	Set a password of 8~15 characters including alphabetic characters, numbers and permitted special characters(!, @, #, $, %, ^, &, * permitted). Log in blocked permanently if log in password fails more than 5 times

❺ press the “Start” button on the measurement screen. The Skeeper and the “Skeeper” app should be connected automatically.

❻ Use the Skeeper app’s contents.

Users should be careful not to leak their usernames and passwords, and should install security programs on their smart devices and keep them up to date.

Note! Skeeper uses BLE communication to deliver human body sound measurement results to the Skeeper app. The user must activate the Bluetooth function of the smart device to communicate with the Skeeper. If the app is paring and bonding with Skeeper for the first time after launching, it will be automatically connected to Skeeper from subsequent launches.

Users should be careful not to leak their usernames and passwords, and should install security programs on their smart devices and keep them up to date.

To keep up with the newest cybersecurity, users should update the SKEEPER APP. Please download and install the updated file distributed by SMATSOUND through the App Store or Play Store.

Warning In the event of a cyber security breach, the Skeeper app detects it and prevents the app from running. If a cyber security incident pop-up appears, the user should stop running the app and inform SMARTSOUN of the fact.

After that, please delete and reinstall the app according to the instructions of Smart Sound.

MEASURMENT

Select the measurement mode on the Skeeper and connect the Skeeper app via Bluetooth to start measuring.

❶ Turn on the Skeeper

❷ Move to the app's measurement screen

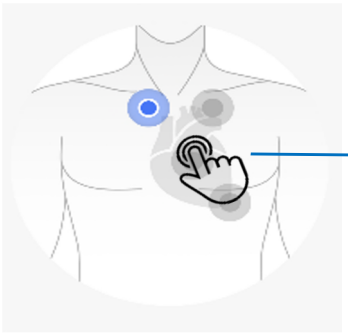
❸ Place the Skeeper at the correct location and press down gently

❹ Recording starts when you tap 'record' in the app.

❺ If you want to stop recording, tap <Stop>.

You will be able to see the result and save the data on your app.

Heart Measurement



Heart

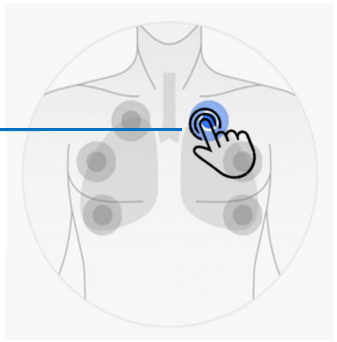
Center of left chest.

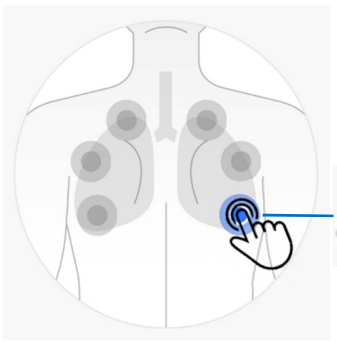
Caution Sit in a comfortable position and avoid moving.

Lung Measurement

Lung

Left under the Clavicle.





Lung

Center of Right Back.

Caution Sit in a comfortable position and avoid moving.

Continuously inhale and exhale deeply for the duration of the measurement session.

SAVING YOUR MEASUREMENT RESULTS

❶ Measurement result can be saved and compared with previous data on your smart device.

❷ Once you press the “save” button, you can select the activity state and input memos

HISTORY

❶ Select a period to display the bar graph and list of measurement results.

❷ Press “List” to display your records.

❸ You can view saved measurement data in the “List” tab of the history page.

CLEANING

Use a soft cloth moistened with a 70% isopropyl alcohol solution and apply to areas of contact.

7. EMC INFORMATION

The following information is intended to ensure that the Skeeper meets EMC standards during its lifetime.

Please note that EMC can be affected by other active medical devices and the general electromagnetic environment, so be sure to read the cautions and warnings in this manual.

The Skeeper complies with the electromagnetic compatibility requirements of IEC 60601-1-2.

Guidance and Manufacturer’s Declaration - Electromagnetic Emissions – This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF radiated emissions CISPR 11	Group 1 Class B	The device 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 conducted emissions CISPR 11	Not applicable	The device 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 Current emissions IEC 61000-3-2	Not applicable	
Voltage change, fluctuations, and Flicker emissions IEC 61000-3-3	Not applicable	

Guidance and Manufacturer’s Declaration - Electromagnetic Immunity – This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure 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	±8 kV contact discharges ±2 kV, ±4 kV, ±8 kV, & ±15 kV air discharges	±8 kV contact discharges ±2 kV, ±4 kV, ±8 kV, & ±15 kV air discharges	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 35%.
Electrical fast	±2 kV for power supply lines; 100	Not applicable	

Transient/burst IEC 61000-4-4	kHz repetition rate ±1 kV for input-output lines; 100 kHz repetition rate		
Surge IEC 61000-4-5	± 0.5, 1 kV line(s) to line(s) ± 0.5, 1, 2 kV line(s) to earth	Not applicable	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	U_T=0%, 0.5 cycle (0, 45, 90, 135, 180, 225, 270 and 315°) U_T=0%, 1 cycle and U_T=70%, 25/30 cycle(@0 degrees) U_T=0%, 250/300 cycle	Not applicable	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical hospital or home environment

Guidance and Manufacturer's Declaration - Electromagnetic Immunity – This device is intended for use in the electromagnetic environment specified below. The user of this device should make sure 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 0.15 MHz to 80 MHz 6 Vrms Amateur Radio & ISM Bands between 0.15 MHz and 80 MHz	Not applicable	Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended 30 cm separation distance. Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	RF electromagnetic Field 10 V/m 80 MHz to 2.7 GHz	RF electromagnetic Field 10 V/m 80 MHz to 2.7 GHz	
	Proximity fields from RF wireless communication - 450, 810, 870, 930, 1720, 1845, 1970, and 2450 MHz at 28 V/m - 385 MHz at 27 V/m - 710, 745, 780, 5240, 5500, and 5785 MHz at 9 V/m	Proximity fields from RF wireless communication - 450, 810, 870, 930, 1720, 1845, 1970, and 2450 MHz at 28 V/m - 385 MHz at 27 V/m - 710, 745, 780, 5240, 5500, and 5785 MHz at 9 V/m	

8. Warranty Period: Two Years

This limited warrant begins on the original date of purchase, and is valid only on products purchased and used in the United States.

9. INQUIRIES

If you have any problems or inquiries regarding the use of the product.

You can receive information and service from the homepage of manufacturer (www.ismarsound.com).

To avoid warranty issues, please read the User Manual, Term of Use, and Safety Information carefully before using this device

- Tel: +82 2 575 2252
- Fax: +82 2 575 2201
- Email: contact@ismartsound.com