CE 0482

Infrared Thermometer

Dual mode - Forehead and Eardrum

LIFESMART™

LS-320

User Manual

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INTRODUCTION

Thank you for choosing the LifeSmart Dual mode Digital Infrared Thermometer.

With the unique technology, this Dual mode infrared thermometer (LS-320) can give consistently accurate results without the interference from ambient temperature.

The dual mode infrared thermometer can scan either forehead or ear within one second. Its special ergonomic design facilitates easy operation. User can track the temperature variations with its 20 readings storage memory. This device is equipped with large LCD display with fever indicator backlight and alarm.

Please read the instructions carefully before using the product, and put it in a safe and secure place for future reference

of transmitter W	$d = [\frac{3.5}{V_1}]\sqrt{P}$	$d = [\frac{3.5}{E_1}]\sqrt{P}$	$d = [\frac{7}{E_1}]\sqrt{P}$
0.01	/	0.12	0.23
0.1	/	0.38	0.73
1	/	1.2	2.3
10	/	3.8	7.3
100	/	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (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.

			
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic 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 Infrared Thermometer is used exceeds the applicable RF compliance level above, the Infrared Thermometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Infrared Thermometer. 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 EQUIPMENT or SYSTEM -for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the Infrared Thermometer.			
The Infrared Thermometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Infrared Thermometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Infrared Thermometer as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2,5 GHz

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1. **The advantages of infrared thermometer**

Multiple use (measurement of forehead temperature and ear temperature)

Thanks to dual mode design, you are free to take body temperature by detecting the infrared heat given off by the forehead ,which is from 32℃ to 42.2℃(from 89.6℉ to 107.9℉) , and by the eardrum, which is from 0℃ to 100.0℃（from 32.0℉ to 212.0℉）.

The product consists of ABS plastics, temperature sensor, Infrared temperature measuring element, microcomputer controlled circuit, LCD , backlight and buzzer.

Convenient for use

●Special ergonomic design to facilitate operation.

●No inconvenience would be caused to your daily life. It's available for measurement when your children's sleeping.

●It provides comfortable user experience compared with anus thermometer for children, rapid reading and simple operation compared with mouth thermometer.

Memory recall

A maximum of 20 previous readings is available to help you track the changes of your body temperature.

Fever warning

When the reading exceeds 37.5℃/99.5℉, this product shall warn the user that he/she may have a fever by 7 rapid and short rings with LCD flicker.(For normal forehead temperature, the signal is long ring with LCD no flicker)

Application scope

The thermometer takes human body temperature for clinical or household use. It applies to all age groups and those who are suffering from a fever.

2. **Necessary safety instructions**

●The device is not used for newborn baby.

●The device is not continuous monitoring device.

●The device is not waterproof. Please do not douse it into water or other liquids. Cleaning and disinfection procedure shall be in comply with the instructions specified in [cleaning and storage]

●Please do not use the product if the temperature sensor or the Dual mode infrared thermometer shows any sign of damage. Do not try to

Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	Portable and mobile RF communications quipment should be used no closer to any part of the JPDFR100 Infrared Thermometer, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = [\frac{3.5}{V_1}]\sqrt{P}$ $d = [\frac{3.5}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 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 metres (m).[b] 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:

RF emissions CISPR 11	Class B	The BM-EF100+ Infrared Thermometer is suitabl e for use in all establishments, including domestic establish ments and those directly connected to the public low-voltage powe r supply network that supplies buildings used for domestic purposes.

Guidance and manufacturer's declaration – electromagnetic immunity –for all EQUIPMENT and SYSTEMS

Guidance and manufacturer´s declaration – electromagnetic immunity			
The Infrared Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the Infrared Thermometer 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 %.
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 or hospital environment.

Guidance and manufacturer´s declaration – electromagnetic immunity –for EQUIPMENT and SYSTEM that are not LIFE-SUPPORTING

Guidance and manufacturer´s declaration – electromagnetic immunity			
The Infrared Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the Infrared Thermometer should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance

repair the product if it is damaged.
●The device consists of precision parts with high quality. Please prevent the product from falling off. Protection shall be provided for no intense shock and vibration. Do not twist the Dual mode infrared thermometer and the temperature sensor.

●Operating Conditions:
Temperature: 10°C to 40°C
Humidity: ≤80% RH, non-condensing
Atmospheric pressure: 860hPa to 1060hPa

●Storage and Shipping Conditions:
Temperature: -10°C to 55°C
Humidity: ≤93% RH, non-condensing
Atmospheric pressure: 860hPa to 1060hPa

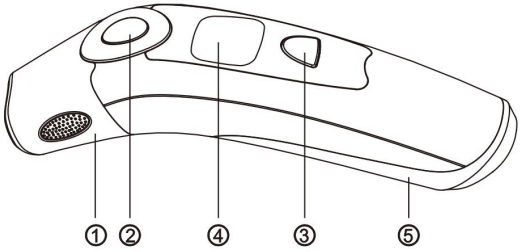
●Battery Installation:
Put the two AAA batteries into battery compartment in correct polarities. Push the battery cover horizontally along the arrow.

Notes:

☆ If you are the first time using the thermometer, please pull out the Plastic sheet .
☆ Battery polarities should be correctly installed. Otherwise, damage may be caused to the device.
☆ Please put in or remove batteries in right order, or may cause damage to the device bracket.
☆ Please remove the batteries if the thermometer will not be used for a long time.

Warnings
●Please keep this Dual mode infrared thermometer out of children's reach
●Medical assistance can't be replaced by the use of infrared Dual mode infrared thermometer
●The Dual mode infrared thermometer is not waterproof! Keep it away from water.

3.Instructions for product designs



(1) Sensor (Take off the cover before detecting the eardrum temperature)
(2) Head: start detection of forehead temperature
(3) Ear: start detection of eardrum temperature
(4) LCD display
(5) Battery cover

4.How to measure the forehead temperature

Hold Button Head, scan the forehead from one side to the other and then release the button when the thermometer is off. Now you can see the temperature reading on LCD display. Detecting temperature on a point may result in inaccurate reading. You can take another measurement when the backlight is off.

5.How to measure the ear temperature

Take off the sensor cover; insert the sensor into the ear canal. Then press the button Ear when the thermometer is off, the temperature reading is shown on LCD display. You can take another measurement when the backlight is off.

In order to avoid the inaccuracy:
(1)Please make sure that there is no dirt in on the temperature sensor
(2)Please make sure that the device only be used in room, and there is no strongly conversation of wind.
(3)Before you measuring the forehead temperature, there shall be no water or any shade on the forehead.
(4) Before you measuring the ear temperature, please clean the ear canal first.

Symbol	Description
	Waste electrical materials should be sent to a dedicated collection point for recycling.
⚠ Warning	A personal injury or thermometer damage may occur if the thermometer is not correctly used.
⚠ Attention	Inaccurate reading or thermometer damage may occur if the thermometer is not correctly used.

15.Declaration

EMC of this product complies with IEC60601-1-2 standard.
The materials which the user can come into contact have no toxicity and no action on tissues comply with ISO10993-1, ISO10993-5 and ISO10993-10.

16. Appendix A: EMC Information-Guidance and Manufacture's Declaration

⚠ **CAUTION:**

- Infrared Thermometer needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided for in the ACCOMPANYING DOCUMENTS.
- Portable and mobile RF communications equipment can affect Infrared Thermometer
- The BM-EF100+ Infrared Thermometer should not be used adjacent to or stacked with other equipment.

Guidance and manufacturer´s declaration – electromagnetic emission –for all EQUIPMENT AND SYSTEMS

Guidance and manufacturer´s declaration – electromagnetic emission		
The Infrared Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the Infrared Thermometer should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The BM-EF100+ Infrared Thermometer 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.

The date of production	See the label
Life	5 years

11. After-sale service

Your LifeSmart product comes with one year extended warranty apart from one year limited warranty. To validate the extended warranty, you are requested to visit our website (www.mylifesmart.net.au) and register your product by filling all necessary information. For further details, please refer to the warranty card.

12. Security type

The signal indicates that the thermometer is a BF type device with internal power supply.

13. Authorized European Representative:

EC REP

Wellkang Ltd
Suite B, 29Harley Street, LONDON, W1G9QR,U.K.

14. Symbols

Symbol	Description
	Type BF applied part.
	Attention must be paid.
	Information about a manufacturer, such as name and address.
	Please read the instructions carefully.

(5)Please make sure that there is no intense emotion and movement before measuring.
(6)If the device is transferred from one condition to another which has different ambient temperature, it is suggested to deposit for more than 30 minutes, and please follow the rule (2).
(7)If the tester is transferred from one condition to another which has different ambient temperature, it is suggested to have a rest for more than 10 minutes, and please follow the rule (2).
(8)Do not hold the device for long time as it is highly sensitive to heat.
The device has undergone clinical test, it is safe and accurate when using in accordance with operation manual.

6. Instructions for display and operation

LCD display	Operational method and instruction for displays	Sound and backlit
	1.Measurement of forehead temperature 1 Measurer the forehead temperature under shutdown state, please press button Head or hold down button Head, it shall display measured value when releasing button, which is under forehead temperature mode. Holding down the button and scanning over the forehead are suggested. The system will read sequentially and record the maximum 2.Measurement of ear temperature Press button Ear within 4 seconds and release it under shutdown state. It shall display measured value, which is under ear temperature mode. 3. Press button Ear or Head under startup mode and enter measurement mode again. Attention: There shall be 7 short rapid ticks and LCD flicker when the measured temperature exceed	1. Forehead temperature mode : 32.0℃/89.6℉ <=t <37.6℃/99.6℉ Ear temperature mode: 0.0℃/32.0℉ <=t <37.6℃/99.6℉ ,there shall be one long ring and green backlit for 3 seconds. 2. Forehead temperature mode : 37.6℃/99.6℉ <=t <42.2℃/107.9℉ Ear temperature mode: 37.6℃/99.6℉ <=t <100℃/212℉ there shall be 7 short ticks and green backlit for 3 seconds

	37.5℃/99.5℉, which is a warning for patients that he/she may have a fever	
 or  or 	Ready for detection, the relative symbol shall twinkle.	
	1. The measured value exceeds 100℃/212.0℉ under ear temperature mode. 2.The measured value exceeds 42.2℃/107.9℉under forehead temperature mode.	3 short tick and green backlit for 3seconds.
	1. The measured value exceeds 0℃/32.0℉ under ear temperature mode. 2. The measured value exceeds 32℃/89.6℉under forehead temperature mode.	3 short tick and green backlit for 3seconds.
Inquiry for memory data, Storing 20 groups of data		
LCD display	Operational method and instruction for displays	Sound and backlit
	Click button EAR for 4-8seconds and LCD displays "- - -" with M signal twinkling.	silence
	Click button EAR again and the LCD displays the first data group with M signal twinkling. Click button EAR and it shall display the serial number for 1 second and then display the measured data and mode icon. There are 20 groups of data.	silence

5.Display resolution	0.1℃/0.1℉
6.Latency Time	1 second
7.Abnormal state display	LCD displays "L ℃" if the measured temperature is below the minimum of measurement range. LCD displays "H ℃" if the measured temperature is below the minimum of measurement range. LCD displays "Er1"if the temperature measurement circuit is abnormal (fault of SENSOR or the temperature measurement circuit), or the ambient temperature exceed 10℃~40℃ (50℉-104℉). There shall be "ErC" if the calibration process is not completed or EEPROM is abnormal.
8.Sound	volume≧50 db (the perpendicular distance from dB Volume sensor to thermometer is 10cm)
9.Automatic shutdown function	10s±1s
10.Low-voltage display function	The product shall display low-voltage signal if the voltage is below 2.51V±0.15V.
11.Memory function	Memorize 20 groups of measured temperature.
12.Current consumption	$I_{stand-by}$<2μA; $I_{working}$<0.5mA; $I_{Buzzer\ on}$<2mA; $I_{banklight}$<15mA
13.LED backlit specifications	≧1.2cd/m²
15.Operational conditions	ASTM 10℃-40℃ (50℉-104℉)/15-95%RH
16.Type of measuring	Applicable for forehead temperature and ear temperature
17.battery	Changeable for two 1.5V triple AAA batteries
18.Battery life	More than 3000 times
19.Accuracy for clinical test	The maximum allowable error for clinical test is specified in the formula below: $Terror = \frac{\lvert T1\text{-}Tref \rvert + \lvert T2\text{-}Tref \rvert}{2}$ ≦0.3℃/0.6℉ (for 95%) Among which: T1 and T2 represent temperature value for thermometer under test respectively, Tref represents the constant reference temperature

Symptom	Possible Cause	Solution
	or written into the memory, or the temperature correction is not complete.	
The temperature reading is lower than the typical body temperature range.	The lens of the temperature probe is dirty.	Clean the lens using a cotton swab.
	The distance between the temperature probe and the target is too long.	Move the thermometer closer to the target.
	The thermometer is not used within 30 minutes after being taken from a cold environment.	Wait for more than 30 minutes after the thermometer is moved into the measurement environment.
The temperature reading is higher than the typical body temperature range.	The temperature probe is faulty.	Contact Genesis Biotech Pty Ltd.

10. Technical specifications

Items	Standards
models	Dual mode infrared thermometer +
1.Applicable regulations and laws	ASTM 1965/EN12470-5/GB/T 19146-2010
2.Temperature units	℃/℉, adjustable
3.Measurement range	Forehead temperature mode:32.0℃-42.2℃ / 89.6°F – 107.9 °F ear temperature mode:0.0℃-100.0℃ /32.0°F – 212.0 °F
4.Precision	±0.2℃ /±0.4°F

		
	The LCD shall only display "- - -", ℃/℉ and M signal with M signal twinkling if there is no test data.	silence
C/F conversion		
LCD display	Operational steps	Sound and backlit
 	Press button Ear for 8-12seconds under shutdown state, and the temperature unit shifts automatically. Press button Ear within 5 seconds after release, and the temperature unit shifts again unless the release time exceeds 5 second. The products shall be automatic startup and enter into the ear temperature mode.	silence
Error message		
	It shall display "Er1" when ambient temperature exceeds 40.0℃/104℉or drop below 10.0℃/50.0℉.	3 short tick and green backlit for 3seconds.
	It shall display "ErC" if there is EEPROM data reading error or the correcting process is not finished. Please contact your supplier.	3 short tick and green backlit for 3seconds.
	There shall be low-voltage signal (no twinkling) when the battery voltage is below2.61V±2%. Please replace the battery.	silence
Power Off Mode		
In any mode, if no operation for 10 seconds, it will power off automatically.		

Attention:

●Electromagnetic interference: + contains sensitive electronic

component and shall not use under the condition with electromagnetic interference,(such as the place nearby the mobile phones and microwaves)

●Please dispose the used products and batteries in accordance with local regulation requirements when the products and batteries are not available.

●Please take out the battery if the device unused for long time.

7.Cleaning and Disinfection

Cleaning

1) Clean the temperature probe with a soft cloth. Clean the lens of the temperature probe with a cotton swab.
2) Wipe the thermometer body with a slightly damp soft cloth, and gently dry the body with a piece of tissue paper.

⚠ Keep water off the lens during the cleaning process. Otherwise, the lens may be damaged.

⚠ The lens may be scratched if it is cleaned with a piece of tissue paper, resulting in inaccurate readings.

⚠ Do not clean the thermometer with corrosive cleansers. During the cleaning process, do not touch the lens using hard objects, immerse any part of the thermometer into liquid, or allow liquid to enter the thermometer.

Disinfection

1) Disinfect the thermometer body and the area around the temperature probe with a cloth slightly moistened with 75% medical alcohol.

⚠ Do not use hot steam or ultraviolet radiation for disinfection. Otherwise, the thermometer may be damaged or quickly aged.

8.Maintenance

1) After each use, clean the temperature probe as described in "Cleaning and Disinfection".
2) Store the thermometer in a dry, dust-free, and well-ventilated place. Ensure that the thermometer is not exposed to sunlight. Ensure that the storage and transportation environments meet the requirements
3) Check whether safety risks exist on a regular basis.
4) Remove the batteries if the thermometer will not be used for more than two months.

9.Troubleshooting

Symptom	Possible Cause	Solution
The thermometer fails to power on.	The battery level is extremely low.	Use new batteries of the same model or specifications.
	Polarities of the batteries are reversed.	Ensure that the batteries are correctly installed according to the polarity symbols in the battery compartment.
	The thermometer is faulty.	If the warranty period does not expire, contact your local distributor.
Only the battery symbol is displayed after the thermometer powers on.	The battery level is low.	Use new batteries of the same model or specifications.
"Er1" is displayed.	The ambient temperature is lower than 10°C (50.0°F) or higher than 40°C (104°F).	Take a measurement under an ambient temperature between 10°C (50.0°F) and 40°C (104°F).
"ErC" is displayed.	An error occurs when data is being read from	Contact Genesis Biotech Pty Ltd or your local distributor.