INV-DC200

0482

Dual Mode Digital Infrared Thermometer

Instruction Manual Ver 2.3

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http://innovogroups.com/products/innovo-thermometer

Introduction

Thank you for purchasing the Innovo INV-DC200 Dual Mode Digital Infrared Thermometer. The INV-DC200 has passed numerous rigorous clinical tests and has proven to be safe, reliable and accurate when used in accordance with the operation manual.

We want to make a thermometer that is capable of accompanying your child from infancy to adulthood. That is why the INV-DC200 Dual Mode Digital Infrared Thermometer is designed to be BOTH an ear thermometer AND a forehead thermometer, offering users the freedom to choose between two modes. We recommend that you use the forehead measurement mode if your child is < 1 yr old. The eardrum measurement mode can be used when they are older and more comfortable with a foreign object in their ear.

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

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10. Warranty and After-Sale Service

For inquiries, please email cs@innovogroups.com

The device is under warranty for one year after the date of acquisition. To extend your warranty period for an additional 1 year, please go to http://www.innovogroups.com and register your purchase.

Batteries, packaging, and any damage caused by improper use are not covered under warranty.

11. Symbols

Symbol	Description
	The product is a Type BF device.
	Attention! Please refer to this User Guide.
	The action expressed in words beside the symbol is prohibited.
	Manufacturer information, including its name and address
	Waste electrical materials should be sent to dedicated collection points for recycling.
 Warning	A personal injury or meter damage may result if the meter is not correctly used.
 Notice	Inaccurate reading or meter damage may result if the meter is not correctly used.

Contents

1. Features of Dual Mode Infrared Thermometer INV-DC200

The INV-DC200 is able to measure both forehead and ear temperatures by detecting the infrared heat emitted by the respective areas. The functional range of the thermometer in forehead mode is between 89.6°F - 107.9°F (32 °C – 42.2 °C) and 32.0°F - 212.0°F (0 °C- 100 °C) in ear mode.

Convenient and easy to use

- Easy mode of operation – Take measurement with the press of a button
- Can be used anytime – even when your child is asleep
- Obtain reading faster than an oral thermometer and more comfortable than a rectal thermometer
- Ergonomic design
- Color coded display for fever detection

Accurate and quick

Utilize the latest infra-red scanning technology – accurate, precise and instant readings.

Safe and hygienic

- Unlike traditional thermometers, there is no glass or mercury that could pose as a potential health hazard. The thermometer is made up of ABS and TPR plastics, a infra-red sensor, an Infrared temperature measuring element, a microcomputer controlled circuit and a LCD screen.
- BPA and latex free.

Memory Recall

Has a Memory Mode that can recall 20 previous readings to track changes in temperature.

Convenient Fever warning

When the temperature exceeds 99.5°F/37.5°C, the thermometer will warn the user that he/she may have a fever by 7 rapid short beeps and a flickering reading with a red backlit on the LCD screen for 3 seconds. (For normal body temperature, the signal is a long beep with a green backlit.)

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	$I_{stand\text{-}by}$<2μA; $I_{working}$<0.5mA; $I_{Buzzer\ on}$<2mA; $I_{banklight}$<15mA
13.LED backlit specifications	≧1.2cd/m^2
14.Operational conditions	ASTM (50°F-104°F)10°C-40°C /15-95%RH
15.Type of measuring	Applicable for forehead temperature and ear temperature
16.battery	Changeable for two 1.5V triple AAA batteries
17.Battery life	More than 3000 times
18.Accuracy for clinical test	The maximum allowable error for clinical test is specified in the formula below: $Terror = \frac{\lvert T1\text{-}Tref \rvert + \lvert T2\text{-}Tref \rvert}{2}$ ≦0.6°F/0.3°C (for 95%) Among which: T1 and T2 represent temperature value for thermometer under test respectively, Tref represents the constant reference temperature

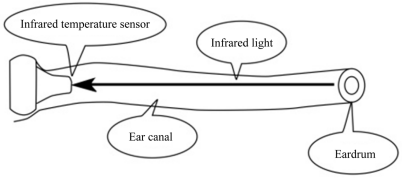
Symptom	Possible Cause	Solution
	environment.	
The temperature reading is higher than the typical body temperature range.	The thermometer probe is faulty.	Contact Innovo.

9. Technical Specifications

Items	Standards
Model	Dual mode infrared thermometer INV-DC200
1.Applicable regulations and laws	ASTM 1965/EN12470-5/GB/T 19146-2010
2.Temperature units	°F/°C, adjustable
3.Measurement range	Forehead temperature mode: 89.6°F – 107.9 °F/32.0°C-42.2°C Ear temperature mode: 32.0°F – 212.0°F/ 0°C-100.0°C
4.Precision	±0.4°F/±0.2°C
5.Display resolution	0.1°F/0.1°C
6.Latency Time	1 second
7.Abnormal state display	LCD displays “L” if the measured temperature is below the minimum measurement range. LCD displays “H” if the measured temperature is above the maximum measurement range. LCD displays “Er1”if the temperature measurement circuit is abnormal (faulty sensor or temperature measurement circuit), or the ambient temperature exceeds 50°F-104°F (10°C-40°C). LCD displays “ErC” if the calibration process is not completed or EEPROM data recording is abnormal.
8.Sound	volume≧50 db (the perpendicular distance from dB Volume sensor to thermometer is 10cm)

Warning!
This product is not intended to substitute advice from a physician, pharmacist, or other licensed health-care professional. You should not use this product for self-diagnosis or for treating a health problem. Contact your health-care provider immediately if you suspect that you have a medical problem.

Operating principle
The infrared temperature sensor detects infrared energy emitted by the eardrum. A built-in lens focuses the collected energy, which is then converted into a temperature reading by the thermopiles and measurement circuits.



2. Precautions - Care and Maintenance

- Do not use the thermometer for purposes not specified in this User Manual. Follow the instructions stated herein and operate the thermometer carefully when measuring children's temperature.
- The device is not designed to be used for newborn babies.
- The device is not a continuous monitoring device.
- Do not use the thermometer under an ambient temperature higher than 40°C (104°F) or lower than 10°C (50°F), which is beyond the operating temperature range of the thermometer. To ensure accurate readings, keep the thermometer under room temperature for more than 30 minutes before use.
- The thermometer is very sensitive to small changes of temperature. Repeated use of the thermometer with no pause in between readings may result in inaccurate reading due to heat caused by friction.
- For an accurate measurement, please wait at least 10 seconds between every reading.
- **Do not touch the tip of the thermometer probe. This may damage the infrared sensor inside.**
- **CAUTION! The thermometer sensor is extremely sensitive. Any dirt and/or oil will prevent an accurate measurement. Check the sensor regularly. The surface should be reflective and gleaming. If it looks dull and lackluster, please clean the sensor before use.**
- To clean the device, use a cotton swab moistened with rubbing alcohol (70% Isopropyl) and clean the casing and measuring probe. Please wait 5-10 minutes for the alcohol to evaporate completely before using the thermometer.
- INV-DC200 is not waterproof. Please do not immerse in water or other liquids.
- Certain parts of the thermometer are lined precisely so that they can perform properly. Do not drop the thermometer or twist the thermometer sensor. The thermometer is not designed to withstand intense impact or vibration.
- Please do not use the product if any part of the thermometer, especially the sensor, shows any sign of damage. Do not attempt to repair the product. Please contact your distributor immediately.

8. 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 has not expired, contact the manufacturer.
Battery symbol displayed when 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).
The temperature reading is lower than the typical body temperature range.	The infrared sensor is dirty.	Clean the sensor using a cotton swab moistened with alcohol. The sensor surface should be reflective and gleaming.
	The thermometer probe is not aligned to the eardrum.	Reposition the thermometer probe so that it is aligned to the eardrum.
	The thermometer is used within 30 minutes after being taken from a cold	Wait for 30 minutes before taking the temperature again

Error message		
	LCD screen will display “Er1” when ambient temperature exceeds 104°F/40.0°C or drop below 50.0°F/10.0°C.	3 short ticks and green backlit for 3 seconds.
	LCD screen will display “ErC” if there is EEPROM data reading error or the calibrating process is not finished. Please contact your supplier.	3 short ticks and green backlit for 3 seconds.
	Low-voltage signal when the battery voltage is below2.61V±2%. Please replace battery.	None
Power Off Mode		
The thermometer will power off automatically if no activity is detected for 5 seconds.		

Attention:

●Electromagnetic interference: INV-DC200 thermometer contains sensitive electronic components. You should not use the thermometer in an area with electromagnetic interference (e.g. near mobile phones or microwaves)

●Please dispose the used thermometer and batteries in accordance with local regulation requirements.

●Please remove the battery if you will not be using the thermometer for an extended period of time.

●Operating Conditions:

Temperature: 50 °F -104 °F (10°C - 40°C)
Humidity: <80% RH, non-condensing
Atmospheric pressure: 860hPa to 1060hPa

●Storage and Shipping Conditions:

Temperature: 14 °F-140 °F (-10°C - 60°C)
Humidity: 0 - 95% RH, non-condensing
Atmospheric pressure: 860hPa to 1060hPa

●Battery Installation:

1. Put two AAA batteries into the battery compartment according to the stated polarities.
2. Slide the battery cover horizontally along the arrow to close.

Notes:

☆ Prior to using the thermometer for the first time, please remove the protective plastic sheet .
☆ Batteries should be installed according to the stated polarities. Otherwise, the device bracket might be damaged.
☆ Please remove the batteries if you will not be using the thermometer for an extended period of time.

Warnings

- The thermometer is not a toy. Please keep out of children’s reach.
- The Dual mode infrared thermometer is not a replacement for seeking medical assistance.
- Please consult with a doctor before using the product on a newborn
- Do not use the thermometer for purposes not specified in the User Manual.

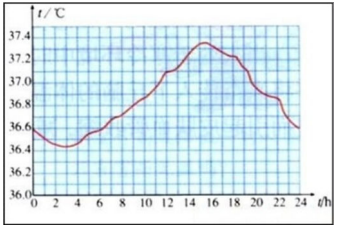
3. Body Temperature

You can take a body temperature via the forehead, ear canal, armpit, mouth or rectum. The temperature measured at different parts of the body may differ slightly.

Body Part	Normal Temperature Range
Forehead	96.44°F-100.04°F (35.8°C–37.8°C)
Ear canal	96.44°F-100.4°F (35.8°C–38.0°C)
Mouth	95.9°F-99.5°F (35.5°C–37.5°C)
Armpit	94.46°F-99.14°F (34.7°C–37.3°C)
Rectum	97.88°F-100.4°F (36.6°C–38.0°C)

The normal body temperature range varies slightly with age and gender. Generally, newborns or children have higher body temperatures than adults, and adults have higher body temperatures than the elderly. Women's body temperatures are approximately 0.3°C (0.5 °F) higher than men's.

Variation in body temperature



Normal body temperature varies by the time of day and is also affected by external factors.
The body temperature of an individual is the lowest between 2:00 a.m. and 4:00 a.m. and the highest between 2:00 p.m. and 8:00 p.m. An individual's body temperature typically changes by less than 1°C (1.8 °F) each day.

L ℃	The measured value falls below 89.6°F/32°C.	7 short beeps and the display will flicker with a red backlit for 3 seconds

Inquiry for memory data, Storing 20 temperature readings

LCD display	Operational method and instruction for displays	Sound and backlit
--- M	Press and hold button F2 between **3-6seconds** and the LCD will display "- - -" with the M signal blinking.	None
6 M 36.8℃ M 36.8℃ M 18.8℃ M	Press button F2 again and the LCD will display the number '1' with the M signal to indicate the first recorded reading. After 1 second, the measured temperature with the mode of measurement icon will be displayed. To recall the next recorded reading, press button F2 again. The number '2' with the M signal will be displayed, indicating the second recorded reading. After 1 second, the measured temperature with the mode of measurement icon will be displayed. Repeat to recall earlier recordings (up to 20 total) if necessary.	None
--- M	The LCD will display "- - -" with the M signal blinking if there is no test data.	None

°C/°F conversion

LCD display	Operational steps	Sound and backlit
---℃ ---℉	When the thermometer is off, press and hold button F2 for **6-9 seconds**.The "- - - " with the M signal will appear first. When the "- - -°C/°F" temperature unit starts blinking, press button F2 again within 5 seconds to change the temperature unit to your choice.	None

7. Instructions for Display and Operation

LCD display	Operational method and instruction for displays	Sound and backlit
	1.Measurement of forehead temperature Press and hold the F1 button and slide the front of the thermometer across the forehead from one temple to the other temple. Once the button is released, the maximum temperature will be displayed on the LCD screen. 2.Measurement of ear temperature Press the F2 button for 1 second. Once the button is released, the temperature will be shown on the LCD screen. 3. To measure again, simply press the F1/F2 button accordingly.	When the temperature is between 89.6°F/ 32.0°C and 99.5°F/ 37.5°C, there will be a long beep and a green backlit will be displayed for 3 seconds. When the temperature is between 99.6°F/37.6°C and 107.9°F/42.2°C, there will be 7 short beeps and the reading will flicker with a red backlit for 3 seconds. This indicates that the subject may have a fever. Please consult your doctor if you are not sure.
 or  or	Forehead measurement mode Eardrum measurement mode	
	The measured value exceeds 107.9 °F/42.2°C.	7 short beeps and the display will flicker with a red backlit for 3 seconds

4. Product Designs

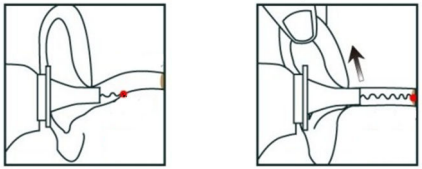
(1) Sensor/Probe (Take cover off to measure eardrum temperature)
(2) F1: Button for measuring forehead temperature
(3) F2: Button for measuring eardrum temperature and access Menu options
(4) LCD display
(5) Battery cover

5. Measuring Forehead Temperature

Hold the F1 button down and slide the thermometer along your forehead from one temple to the other. Please note that the thermometer SHOULD be in contact with the forehead at all times during measurement. This should take <5 secs. Release the F1 button when you are done. The maximum value will be displayed on the LCD screen. You might hear a soft clicking sound when swiping the thermometer across the forehead. (Note that due to the low volume of the clicking sound, it may not be audible to some people. This is NOT an indication that the thermometer is defective). **If you do not move the thermometer across the forehead but take a fixed point measurement instead, it may result in an incorrect temperature reading.** You can take another measurement by pressing the F1 button at any time although it is recommended that you wait 10 seconds between readings. If the thermometer shows a reading before you completed the swipe, then you have accidentally released the F1 button. Please take the temperature again.

6. Measuring Temperature via Eardrum

Gently remove the sensor cover and insert the probe into the ear canal.



Incorrect position **Correct Position**

Figure 1

For children > 1 year old, gently pull the ear up to ensure that the ear canal is straight (See Figure 1). Position the thermometer probe carefully so that it is aligned with the eardrum to ensure accurate measurement readings. This applies to adults as well.

For children < 1 year old, gently pull the ear straight back to ensure that the ear canal is straight (see Figure 2).

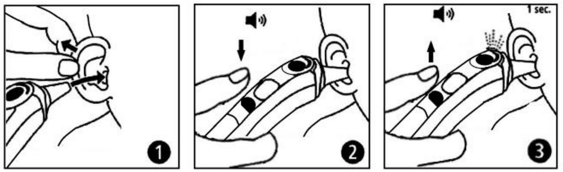


Figure 2

Once you have inserted the thermometer probe into the ear, press the F2 button for 1 sec to take the measurement. The temperature will be shown on the LCD display. **Do not press the F2 button for more than 3 seconds as you will activate the memory retrieval mode.** You can take another measurement by simply pressing the F2 button again.

In order to avoid inaccuracy:

1. The sensor is extremely sensitive. Any dirt and/or grease on it might prevent an accurate measurement. For best result, please check and clean it regularly. **Please note that the sensor can look deceptively "clean" when it is not. The surface of a clean sensor should be reflective and gleaming. If it looks dull and lackluster, then it is dirty. Please clean the sensor with a cotton swab moistened with alcohol and wait 5-10 mins for the alcohol to completely evaporate before using the thermometer.**
2. Please use the thermometer indoor or in an environment where there is no strong air draft.
3. Do not move during measurement.
4. Make sure there isn't any sweat, water or condensation on the forehead.
5. If the thermometer is transferred from an environment where the ambient temperature might be different, please wait at least 10 minutes and follow rule number 2 before using the thermometer.
6. Do not hold the thermometer for a long time as it is highly sensitive to heat.
7. Keep the infrared sensor probe clean to ensure accurate readings.
8. Before measuring temperature from the ear, remove earwax, if any. Keep the ear canal clean.