



Precision Sensors Design Inc.
精匠微電子股份有限公司

EARBUDS with a Built-in Tympanic IR Thermometer



PSD BTWS01

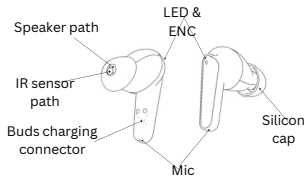
PSD BTWS01

Immerse yourself in unmatched high-fidelity sound while effortlessly tracking your eardrum temperature. With our advanced technology, temperature data syncs seamlessly to the smartphone.

Bluetooth setup, temperature measurement, and specifications are detailed in this user guide. For the best experience, we recommend reviewing the guide thoroughly.

Inside the Box & Overview

1 pair earbuds



1 nos Type C cable and charging port

2 nos silicon caps

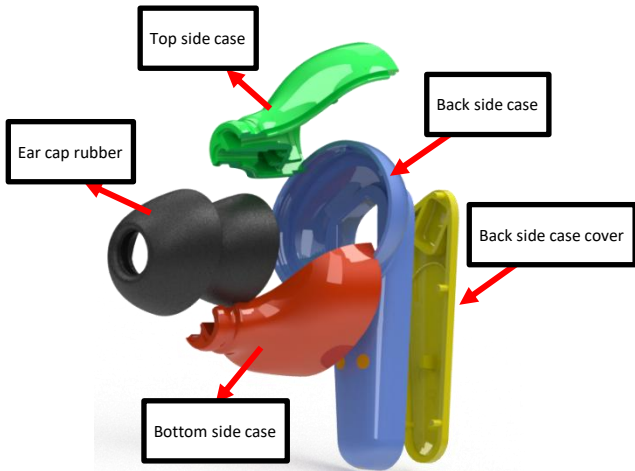


User guide

Earbuds connection with Bluetooth

- 1.Ensure the earbuds are fully charged before pairing. Place them in the charging case and check the battery status.
- 2.Remove the earbuds from the case. They should automatically turn on and enter pairing mode (the LED indicator blink).
- 3.Turn on Bluetooth, go to pair new device, and wait for the device to scan for available connections.
- 4.Look for your earbuds' name in the available devices list (BTWS01) then tap to connect.
- 5.Once connected, you will hear a voice prompt and the LED blinking will stop.
- 6.Play music or a video to ensure the audio plays through the earbuds.
- 7.If one earbud is not working, place both in the case and retry the pairing process.
8. After the first connection, the earbuds will automatically connect to the device when taken out of the case, provided Bluetooth is enabled.
- 9.For a seamless connection between both earbuds and smooth activation of the temperature sensor, first remove the right earbud (which has the built-in temperature sensor) from the charging case, followed by the left earbud. Then, proceed with pairing.
- 10.The temperature sensor is on right side only so please use right side earbuds for temperature measurement
11. If you check temperature measurement while audio on then the left earbuds should be disconnected (inside the charging case) for continue temperature measurement.

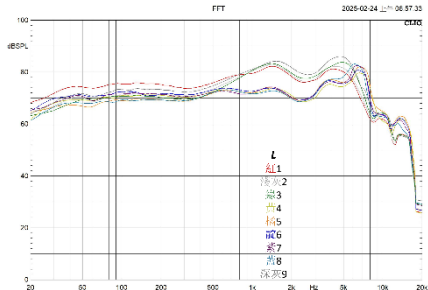
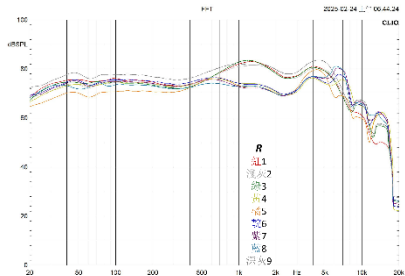
External Parts Nomenclature



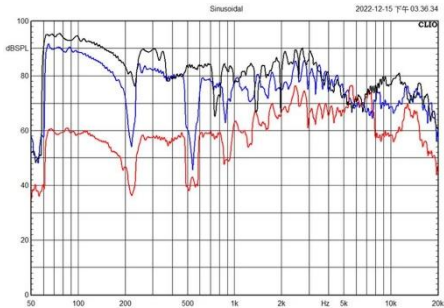
Specifications

Pairing name	BTWS01, BTWS01_L, BTWS01_R
Connectivity	Bluetooth BT4.2, Supports A2DP, HSP, HFP, HTP
Sensor	Infrared Thermometer
Ear Thermometer Range	32.2°C to 43.3°C
Thermometer Accuracy	35.0°C to 42.0°C: $\pm 0.2^{\circ}\text{C}$, $<35.0^{\circ}\text{C}$: $\pm 0.3^{\circ}\text{C}$, $>42.0^{\circ}\text{C}$: $\pm 0.3^{\circ}\text{C}$
Sensitivity	93dB \pm 3dB
Frequency Response	20Hz to 20kHz
Charging and Operating time	Charging time <1 hour Operating time 2.5 hours (full charge)
Earbuds Battery	Li-Polymer (50mAh)
Battery Life	4 hours (at 50% volume)
Charging Case Voltage	DC 5V
Charging Case Interface	USB Type C
Charging Case Battery	Li-Polymer (800mAh)
Earbud Weight	9.4 grams (both)

Right & Left earbuds frequency response



Comparative frequency response

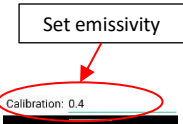
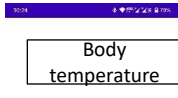
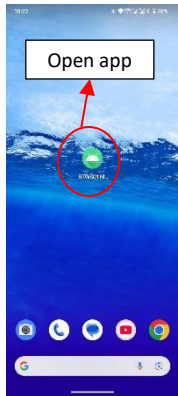


- PSD funnel shaped sound waveguide 1.
- PSD funnel-shaped sound waveguide 2.
- Well-known earbuds company.



Audiomatic Clio 12.

Temperature measurement Demo



Touch control function



Function	Left	Right
single tap	Sound decrease	Sound increase
Double tap	Answer calling/music on and off	Answer calling/music on and off
Triple tap	normal/cam transparency mode (Cam)	normal/cam Normal mode (ENC)
Four tap	Voice Assistant	Voice Assistant
Hold 3 secs	Audio track previous	Audio track next
Hold 7 secs	turn off	turn off

Cautions

1. Avoid Excessive Volume – Listening at high volumes for prolonged periods can cause hearing damage. Use moderate volume levels.
2. Keep Dry – Do not expose the earbuds to water or moisture unless they are specifically designed for water resistance.
3. Handle with Care – Avoid dropping or applying excessive force to prevent damage.
4. Charge Safely – Use only the recommended charger and avoid overcharging to prevent battery issues.
5. Keep Away from Extreme Temperatures – Do not expose the earbuds to excessive heat or cold, as it may affect battery performance.
6. Clean Regularly – Wipe the earbuds and charging case with a dry or slightly damp cloth to remove dust and earwax buildup.
7. Avoid Interference – Keep away from devices emitting strong electromagnetic waves, as they may interfere with Bluetooth connectivity.
8. Store Properly – Place the earbuds back in the charging case when not in use to avoid misplacement or damage.
9. Follow Usage Instructions – Always refer to the user manual for proper use and troubleshooting.

Charging the Case and Earbuds

Earbuds

1. Place the Earbuds in the Charging Case – Ensure both earbuds are securely placed in their respective slots.
2. Check the LED Indicator – The earbuds' LED will turn red and blink every 3 seconds, indicating they are charging.
3. Wait Until Fully Charged – The earbuds take approximately 1 hour to fully charge.
4. Charging Complete – The LED will turn off when fully charged.

Charging Case

1. Use the Recommended Charger – Connect the charging case to a USB-C cable.
2. Plug into a Power Source – Use a wall adapter, power bank, or computer USB port.
3. Check the Charging Indicator – The case's LED will blink, displaying one to four levels to indicate charging progress.
4. Fully Charged Case – The LED indicator will remain solid at four levels when fully charged.
5. Unplug and Store – Disconnect the charger once the case is fully charged to preserve battery life.

Why Earbuds with built in thermometer?

The earbuds use an infrared (IR) temperature sensor to measure the temperature at the eardrum, which closely reflects the body's core temperature. This works on the principle of Planck's radiation law, capturing infrared radiation emitted by the eardrum. Since eardrum temperature is minimally affected by external conditions, it provides accurate and stable temperature readings.

These earbuds provide highly accurate body temperature readings achieving an accuracy of $\pm 0.2^{\circ}\text{C}$.

These earbuds combine audio playback with health monitoring, offering a 2-in-1 solution for users. This integration eliminates the need for separate devices for music and temperature measurement.

Applications:

- **Fitness and Sports:** Athletes can monitor their body temperature during intense workouts to prevent overheating.
- **Health Monitoring:** Individuals with certain medical conditions can keep track of their temperature throughout the day.
- **Fever Management:** These earbuds can be useful for early detection and monitoring of fevers.
- **Occupational Health:** Workers in high-temperature environments can use these to ensure they're not at risk of heat-related illnesses.
- **Research:** The continuous temperature data can be valuable for medical research and studies on body temperature variations

EARBUDS with a Built-in Tympanic IR Thermometer



Visit: <https://pxd.com.tw> **Email us:** sales@pxd.com.tw