

CTA TactileHead

Head Comfort & Pressure Mapping System

INTRODUCTION AND PRODUCT OVERVIEW

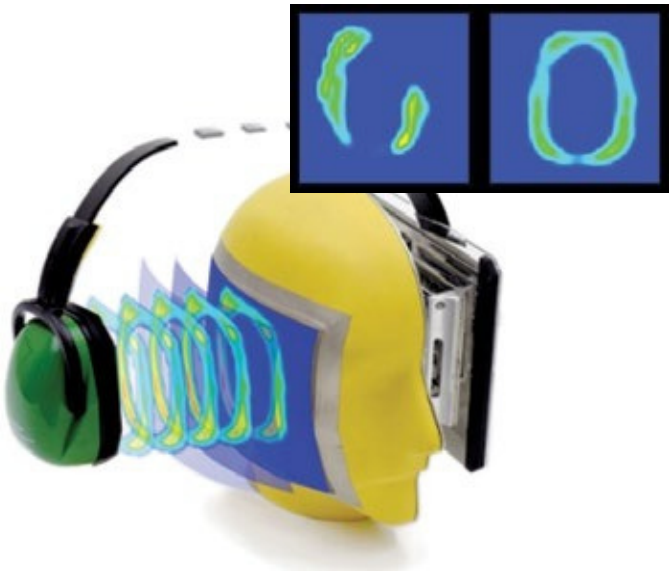
The TactileHead is a customizable pressure measurement and mapping system for quantifying pressures exerted on the head from wearable head products.



For headset and hearing protection manufacturers who need to balance the most effective product with the most comfortable fit, the TactileHead can accurately capture and visualize the interaction between the headset and the complex shapes of the head by imaging the applied pressures.

The system features adjustable head widths to allow capture of pressure data from different head sizes. A high resolution conformable TactArray-based sensor is molded onto the curved area around the ear of the mannequin head, while another high resolution TactArray sensor is mounted to a flat plate on the other side of the head to provide a controlled comparison.

Real time visualization and acquisition software is then used to display pressures from both sensors simultaneously and to perform real time analysis for evaluating the fit and comfort.



KEY BENEFITS

+ Map, visualize, and quantify pressure of wearable head products
+ Capture accurate data across irregularly shaped devices or complex head geometry
+ Reliable accuracy even over numerous repeated tests
+ Ability to capture pressure around the ear
+ Customizable system to match your specific project needs

Features and Applications

KEY FEATURES

+ Head widths adjustable from 5.25” wide to 8.75” wide
+ Standardized spacer plates simulating 5th to 95th percentile head widths
+ Second conformable sensor features a cutout for pressure mapping around objects like ears
+ Soft cloth-based sensors with embedded shielding ability





APPLICATIONS

Initially designed for safety earmuff and headset testing applications, the TactileHead Comfort and Pressure Measurement System has since been widely used in both consumer sport and wearable comfort and fit assessment.

Actual and potential applications include:

+ Quantitatively measure comfort and fit of headphones, hearing protection, earmuffs, or headbands.

+ Accurately map, measure, and refine head pressures produced by a product.

+ Identify areas of high or abnormal pressure, signalling points of discomfort.

+ Determine the optimal tightness of a head-mounted product to ensure non-slippage.

ChameleonTM Tactile Visualization and Recording (TVR) Software

PPS’s Chameleon™ Tactile Visualization and Recording (TVR) software is a pressure imaging solution providing intuitive, easy to use, high quality pressure mapping visualization.

Chameleon™ TVR software allows users to export, replay, save and analyze data. Data can even be analyzed live during recording or after the file has been saved. Live visual recordings can be captured using an accessory webcam, which can be replayed with the data to provide context.

SYSTEM COMPONENTS

1. TactileHead & Mounted Sensor
2. Flat CTA Sensor
3. T5000 Electronics (one for each sensor)
4. TactileHead Stand

Not shown: T5000 sync cable, USB Hub & USB cables, webcam, and USB Hub Power Cable



HEAD WIDTH SPACERS



Three head width spacers are provided with the system. Each spacer corresponds to a standardized head width (14.4, 15.7, or 16.5 mm), representing 5th percentile female and 50th and 95th percentile male head widths, respectively.†

In addition to using the spacers, the width of the TactileHead System can be varied incrementally between 5.25” and 6.25” (absolute max 8.75”).







† AMRL-TR-74-102 Churchill, E. Sampling and Data Gathering Strategies for Future USAF Anthropometry Webb Associates, Inc. A/F Aerospace Medical Res 2-76; pp. 121-128; 308; 351; NASA-STD-3000 268pT and 268 hT.

SENSOR MODELS AND METRICS

Sensor Characteristics and Performance

Sensing Elements	884 to 1024 depending on model
Full Scale Range	2 psi
Spatial Resolution	2x2 mm to 3.8x3.8 mm
Minimum Sensitivity	0.2%
Signal-to-Noise (SNR)	400:1
Gain Non-Repeatability	0.4%
Linearity	99.8%
Accuracy Error	≤ 2%
Sensor Thickness	0.04” (1 mm)

Electronic Specifications

Scan Rate	10 Hz
Interconnection	USB 2.0
ADC Resolution	12 bit
Input Voltage / Power	5 V / 2 W
Cable Length	5.9” (1.5 m)
Operating Temperature	23 °C to 27 °C (static)

[1]Performance numbers are for typical system response.

FAQS

1. What is the minimum pressure sensitivity that the TactileHead can detect?
   The minimum pressure that each individual TactileHead sensor element (14.4 mm²) can detect is 28 Pa, or 0.004 psi.
2. Does the TactileHead measure pressure or force?
   The TactileHead system is calibrated in units of pressure (i.e., psi or N/cm²). Force values are calculated using the known area of the sensor element.
3. How often does the TactileHead require calibration?
   The capacitive-based sensing modality of PPS sensors results in reliable stability and superior repeatability. With proper use and care, the TactileHead should retain its calibration for years.

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