

SMART PILLOW SENSING PLATFORM

Sleep, Snore & Vital-Sign Monitoring In One Pillow

A sub-1.2 mm flexible FSR sensing layer that disappears into the pillow - head pressure mapping, posture and anti-snore detection, respiration and heart rate.

**10 - 32**

SENSING POINTS

< 1.2 mm

STACK HEIGHT

100 Hz

SAMPLING RATE

+/- 3 %

FS ACCURACY

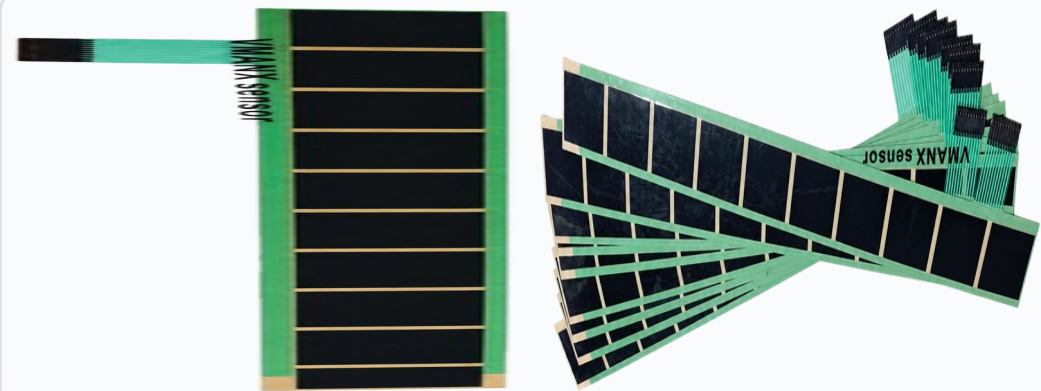
1 M+

PRESS CYCLES

PRODUCT FORMATS

Two Sensing Formats, One Platform

The same signal chain ships either as a slim linear strip array for pillows and headrests, or as a shaped multi-zone mat for wider body areas.



LINEAR FSR STRIP ARRAY

PET / green solder-mask flexible strip with 10 discrete sensing pads and an FFC tail. Captures head load, posture shift and micro-movement.

- 10 sensing pads per strip
- Width from 18 mm
- FFC 1.0 mm pitch



SHAPED MULTI-ZONE MAT

Non-woven laminated matrix with spacer-mesh isolation and 3M adhesive mounting. Free-form outline cut to your product shape.

- Free-form die-cut outline
- Spacer-mesh isolation
- 3M 9448A mounting

WHAT IT MEASURES

Three Signal Domains, One Layer

A single printed sensing layer resolves static load, slow posture change and micro-vibration - pressure mapping, posture logic and vital signs from the same hardware.

01

PRESSURE DISTRIBUTION

Resistive matrix resolves head and neck load into a live heat map with peak-zone detection for pressure relief and pillow-height fitting.

- Range 0 - 100 kPa
- Peak-zone alerting
- Relief score output

02

POSTURE & ANTI-SNORE

Load-pattern classification separates supine, lateral and prone, then triggers the customer actuator when snore-risk posture persists.

- 4-state posture logic
- Turn-interval logging
- Trigger output API

03

RESPIRATION & HEART RATE

Ballistocardiographic micro-vibration is filtered from the same channels to recover breathing and pulse fully contact-free.

- Respiration 6 - 40 rpm
- Heart rate 35 - 150 bpm
- Contact-free pickup

— ANTI-SNORE LOGIC

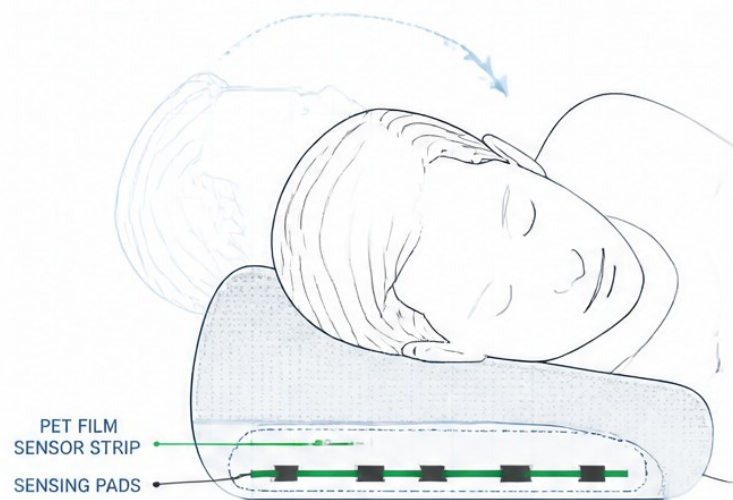
Detect The Posture, Not Just The Sound

Acoustic-only products react after the noise. A pressure layer sees the posture that collapses the airway, which is what makes closed-loop intervention possible.

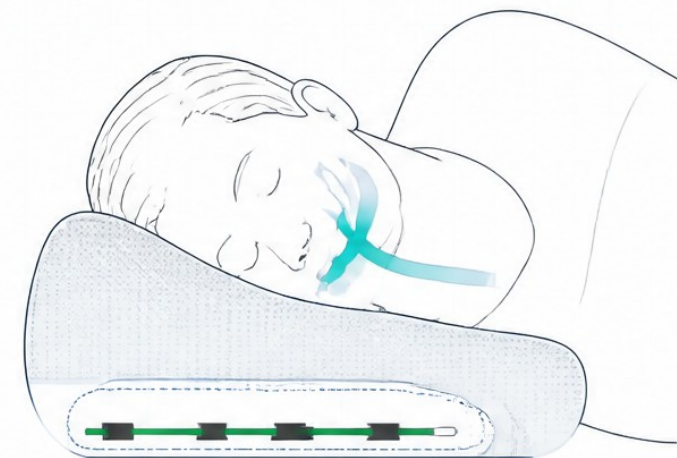
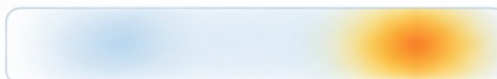
CLOSED-LOOP ANTI-SNORE SENSING



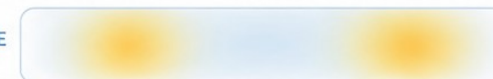
PRESSURE
MAP



PRESSURE
MAP



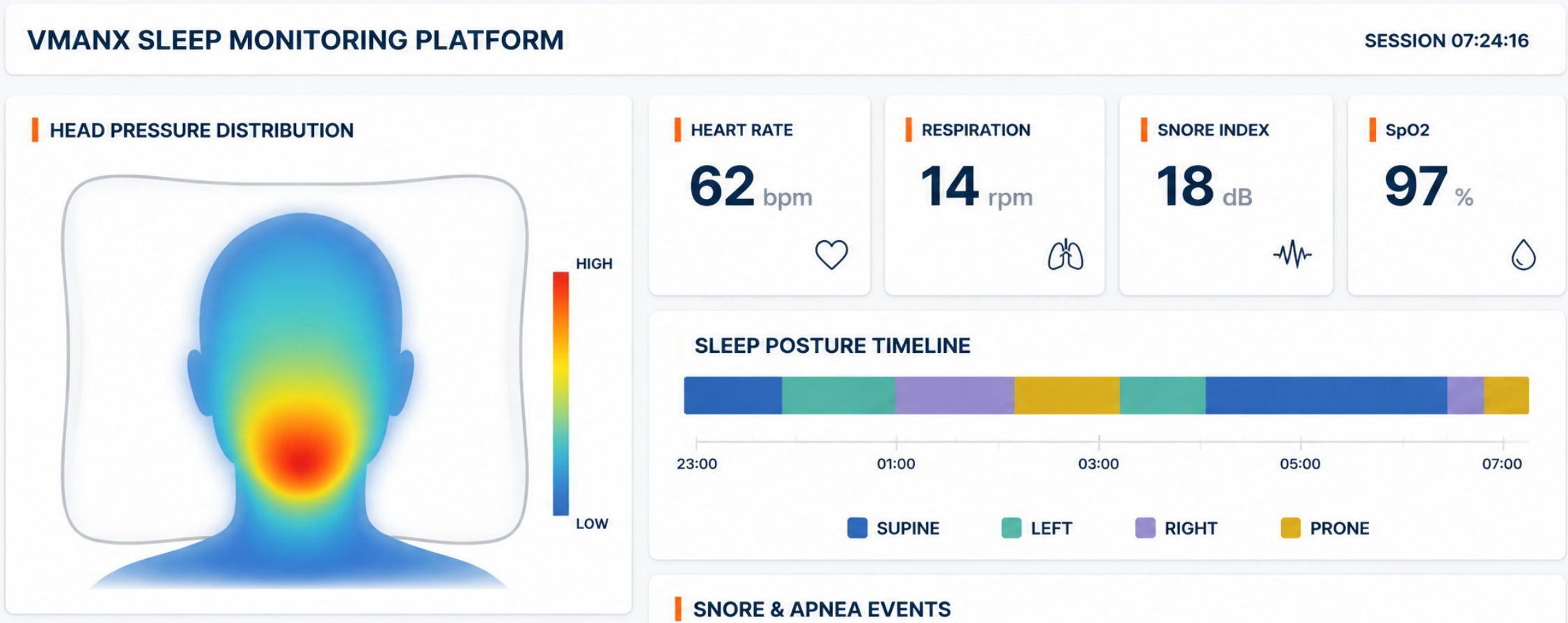
PRESSURE
MAP



— SOFTWARE & VISUALISATION

Host Monitoring Platform Included

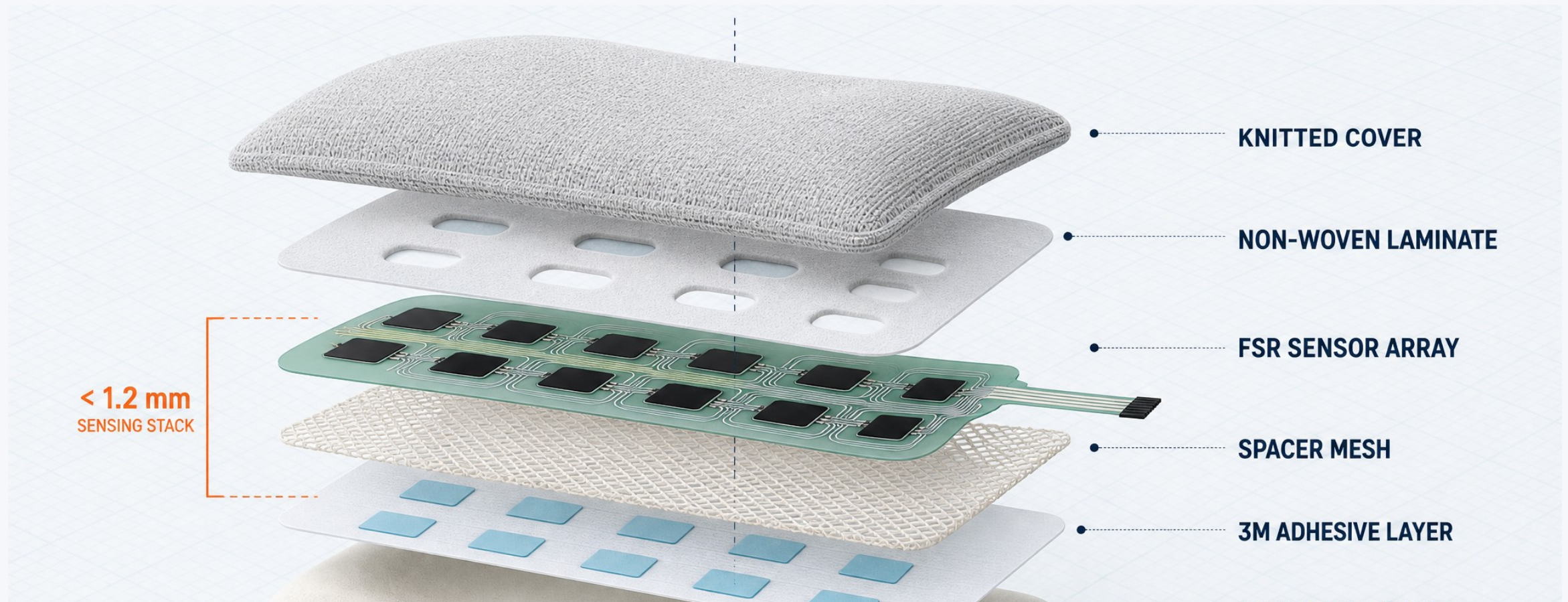
Bundled host software renders the pressure heat map with vital-sign values, posture timeline and snore events. Full protocol and SDK released for integration.



LAYER CONSTRUCTION

Under 1.2 mm Total Build Height

The sensing stack laminates into the pillow without changing its feel - no rigid board, no hard edge under the head.



— TECHNICAL DATA

Specification Overview

Baseline configuration shown; pad count, active area, outline, connector and firmware are customised per project.

PARAMETER	SPECIFICATION
Sensing technology	FSR piezoresistive matrix, screen-printed
Active area	Strip 18 x 240 mm / mat free-form
Pressure range	0 - 100 kPa (extendable)
Response time	< 10 ms
Respiration range	6 - 40 rpm, contact-free
Posture states	Supine / left / right / prone
Isolation layer	Spacer mesh, non-woven laminate
Operating temperature	-20 C to +60 C
Interface	FFC / USB / UART / RS-485 / BLE

PARAMETER	SPECIFICATION
Sensing points	10 standard, up to 32 customisable
Total thickness	< 1.2 mm stack, 0.325 mm film
Full-scale accuracy	+/- 3 % FS after calibration
Sampling rate	Up to 100 Hz per full frame
Heart-rate range	35 - 150 bpm, BCG pickup
Substrate material	Flexible PET, silver + carbon
Mounting	3M 9448A double-sided adhesive
Durability	> 1,000,000 press cycles
Power supply	DC 5 V, < 2.0 W typical

MATERIAL & MANUFACTURING

Printed In Our Own Cleanroom

Silver and carbon conductive inks are screen-printed onto flexible film in-house, then 100 % electrically and optically inspected before lamination.



IN-HOUSE PRINTING

Roll-to-roll screen printing of silver / carbon traces

PRECISION LAMINATION

Multi-layer alignment within +/- 0.10 mm

100 % INSPECTION

Electrical continuity and optical trace verification

CALIBRATION BENCH

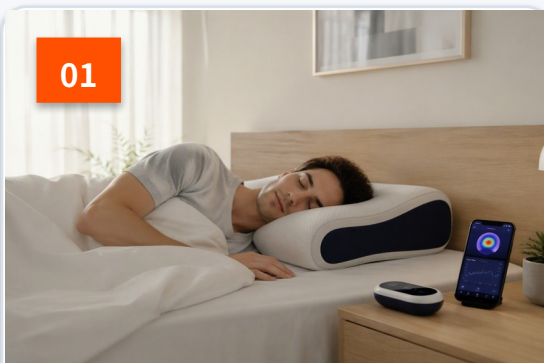
Every unit pressure-calibrated before shipment

APPLICATION SCENARIOS

One Platform, Four Markets

The same sensing platform is tuned per market - comfort analytics, care-home alarm logic, clinical resolution and retail demonstration.

01



SMART HOME PILLOW

Sleep staging, snore reports and adaptive height control through your app.

02



ELDERLY & NURSING CARE

Contact-free respiration, turn intervals and off-pillow alerts cut night rounds.

03



SLEEP LAB & CLINIC

Objective posture and head-load data without extra electrodes on the patient.

04



BEDDING RETAIL STORE

A 60-second head pressure scan turns pillow selection into data-backed advice.

— QUALITY & COMPLIANCE

Built To Medical Device Standards

Manufactured under a medical-device quality management system with biocompatible skin-contact materials and full substance compliance documentation.

ISO 13485:2016

Medical QMS

ISO 10993

Biocompatibility

RoHS / REACH

Substance Compliance

Certification documentation is issued per project scope and provided during technical review.

For OEM use. End-device certifications such as CE MDR and FDA clearance are held by the customer placing the finished product on the market.

OEM / ODM

Pad layout, active area, outline and connector to your drawing.

ALGORITHM PORT

Pressure, posture and vital-sign algorithms ported to your platform.

UI CUSTOMISATION

Host software re-skinned with your brand and report layout.

SAMPLE & PILOT

Samples in 10 - 15 days, pilot production in 25 - 30 days.

Start Your Sensing Project With VMANX

Send your pillow size, target parameters and volume - technical proposal within 24 hours.

VMANX[®] Sensor

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