

TPU ELECTRONIC SKIN FSR MATRIX

Pressure Sensing That Moves Like Skin

Ultra-thin stretchable TPU pressure matrix for robotic skin, humanoid bodies and dexterous hands.

**< 0.23 mm**

TOTAL THICKNESS

TPU

STRETCHABLE SUBSTRATE

8 × 8

64-POINT MATRIX

FSR

PRESSURE SENSING

— MATERIAL ARCHITECTURE

TPU: The Substrate That Behaves Like Skin

Transparent TPU stretches, bends and follows moving surfaces while the printed matrix remains integrated inside a total stack under 0.23 mm.



SUB-0.23 MM STACK

- | | | |
|----|--------------------|-------------------------------|
| 01 | TPU TOP FILM | Soft environmental cover |
| 02 | PRINTED ELECTRODES | Fine conductive routing |
| 03 | FSR SENSING LAYER | 64 independent pressure nodes |
| 04 | TPU BOTTOM FILM | Stretchable bonding substrate |

Total thickness: < 0.23 mm

01

STRETCH

Moves with robot surfaces

02

CONFORM

Wraps compound curves

03

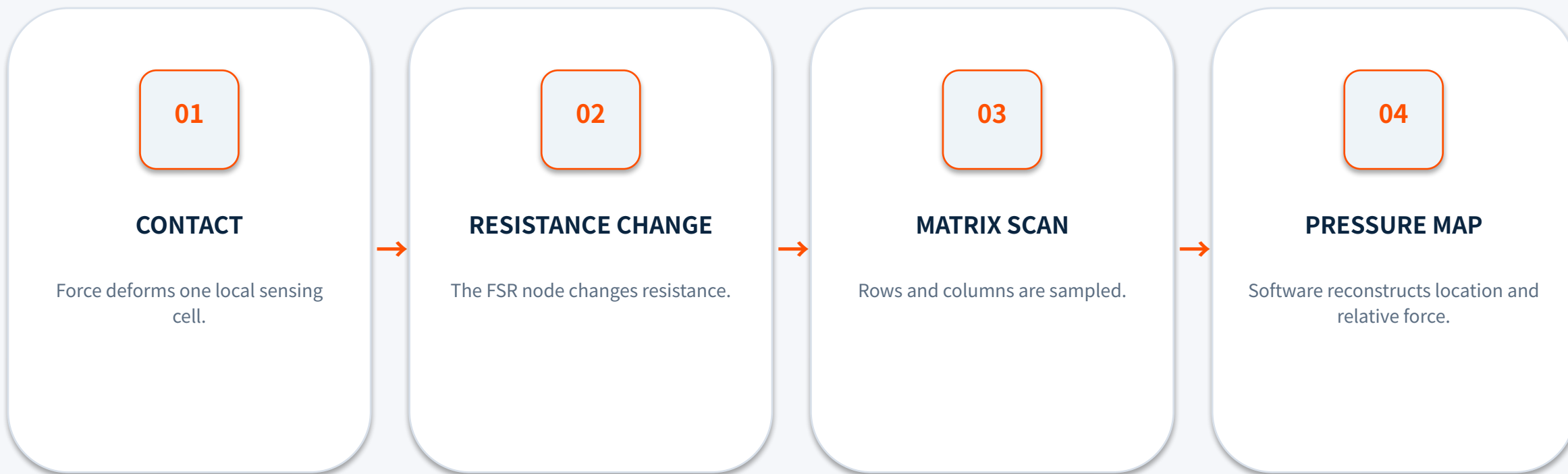
SENSE

Function maintained under deformation

 HOW IT WORKS

From Contact Force To Pressure Map

The 8×8 matrix converts local force into independent resistance changes; customer electronics scan the 64 channels and reconstruct a spatial pressure distribution.



Signal conditioning, scan voltage, calibration curve and sampling strategy are project-specific.

ROBOTICS APPLICATIONS

A Distributed Sense Of Touch

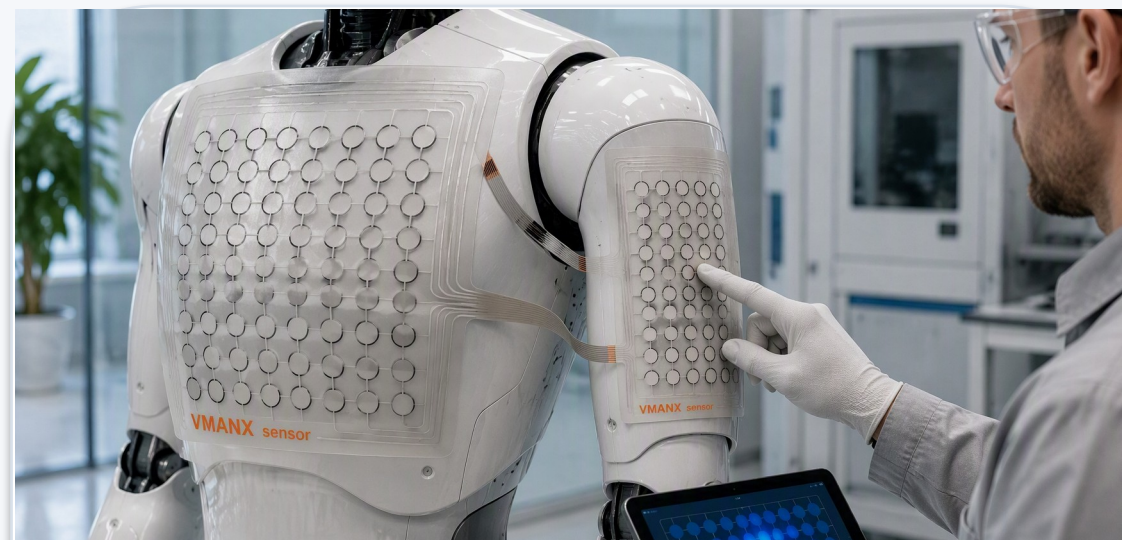
The same matrix architecture scales from hand contact to body coverage, using TPU compliance to stay close to the moving surface.



DEXTEROUS HANDS

Distributed palm feedback helps control grip force on fragile and irregular objects.

64-POINT MAP • COMPLIANT GRIP • TACTILE FEEDBACK



HUMANOID BODY SKIN

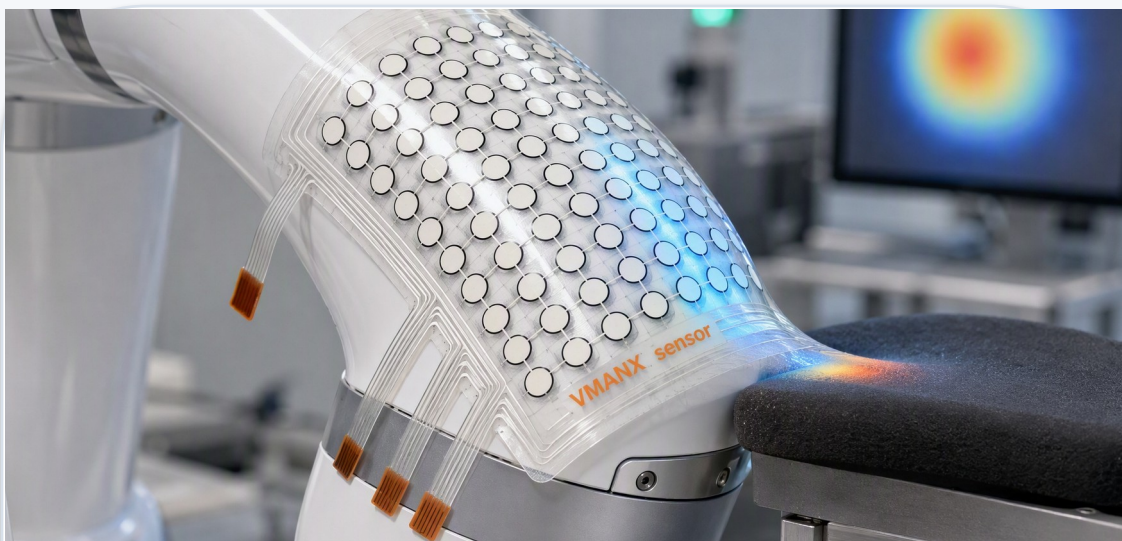
Wide-area contact sensing adds touch awareness to chest, arm and service-robot surfaces.

CURVED-SHELL FIT • TOUCH LOCATION • COLLISION AWARENESS

— SURFACE ADAPTATION

From Joint Curves To Soft Grippers

Ultra-flexible TPU lets one sensing concept move across different robot geometries without forcing the surface flat.



CURVED ROBOT JOINTS

The film follows a tight elbow radius while preserving the continuous sensing grid.

STRETCHABLE TPU • CURVED MOUNTING • STABLE TOPOLOGY



COMPLIANT GRIPPERS

Pressure distribution at the contact interface supports gentle handling and slip control.

SURFACE PRESSURE • FRAGILE HANDLING • FEEDBACK CONTROL

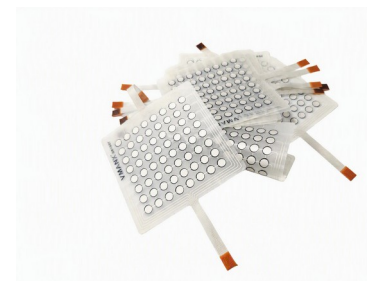
REAL PRODUCT EVIDENCE

Actual TPU FSR Matrix Samples

All four supplied product photographs are placed as-is: no AI redraw, no geometry reconstruction, no stretching and no cropped product edges.

**BATCH STACK**

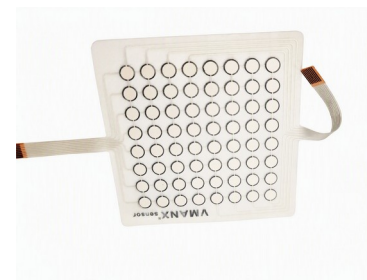
Multiple tail directions

REAL PHOTO**MATRIX FAMILY**

Repeatable 8×8 geometry

REAL PHOTO**BENDING PROOF**

Natural out-of-plane bend

REAL PHOTO**FLAT TOPOLOGY**

Complete 64-point matrix

REAL PHOTO

ENGINEERING SPECIFICATION

Known Facts Separated From Project Values

Confirmed facts are shown directly. Electrical ranges remain project-specific until supported by the applicable test report.

CONFIRMED PRODUCT FACTS	
Sensor type	FSR pressure-sensing matrix
Substrate	Stretchable TPU
Total thickness	< 0.23 mm
Matrix layout	8 × 8 / 64 sensing points
Mechanical behaviour	Stretchable and ultra-flexible
Surface fit	Conformal to curved surfaces
Deformation effect	Function maintained under stretch
Tail / contact	Flexible printed tail

ELECTRICAL VALUES — PROJECT SPECIFIC	
Pressure range	Project-specific / TBC
Initial resistance	Project-specific / TBC
Operating voltage	Customer scan circuit
Response / recovery	Project-specific / TBC
Linearity / hysteresis	Project-specific / TBC
Stretch ratio & cycles	Project-specific / TBC
Operating temperature	Project-specific / TBC
Environmental sealing	Finished-assembly defined

MATRIX GEOMETRY

Node count, pitch and active area to the robot surface.

TAIL ROUTING

Single/multiple tails and contact pitch.

SENSITIVITY

Response tuned through material and electrode design.

LAMINATION

Bonding stack matched to shell or elastomer.

 QUALITY & SUPPLY

Industrial-Grade OEM Development

From matrix definition and printing to lamination, routing and functional validation — one engineering chain for robotic-skin projects.

ISO 9001

Quality System

RoHS / REACH

Substance Compliance

Certification and compliance documentation is supplied according to project scope.

01**DEFINE**

Matrix & mechanics

02**PRINT**

Electrodes & FSR

03**LAMINATE**

TPU stack

04**TEST**

Electrical & stretch

05**DELIVER**

Samples & production

Define Your Robot Skin Matrix

Send target surface, node layout, pressure window and interface.

VMANX sensor

WWW.VMANX.COM

Electrical values are project-specific until confirmed by the applicable test report.