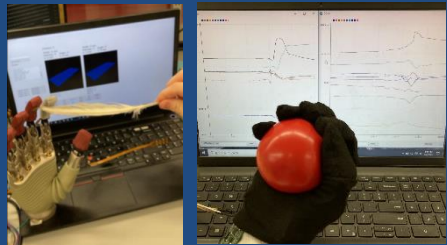


Tactile Fingertip™ Humanlike Touch Sensing



ROBOT HANDS & AI-ML GLOVES

Bringing humanlike touch to humanoid fingers, palms, and hands for control & dexterity. Physical AI-ML for training complex tasks.



STANDARD GRIPPERS

Superior touch info, control, and dexterity in real-time. Customizable.



TACTILE TOUCHSKIN™

Flexible, elastic, adaptive. Key robot touch points with skin-like touch.

COMPATIBLE: PLUG & PLAY

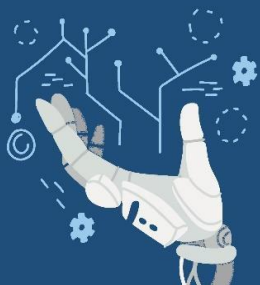
ROS ROS2

EXTREMELY SENSITIVE & GENTLE

Highly sensitive to force, position changes, and shear, the Tactile Fingertip enables measurement of grasp force and pressure, pose, shape, and stability. Protects objects being handled and your hardware.

DURABLE

Gentle and compliant yet tough.



Ras Labs has combined material science innovation and bioinspiration with data science and precision engineering to provide the first, state-of-the-art, truly tactile sensor for robotic gripper end of arm tooling (EOAT) and humanoids. The Tactile Fingertip™ is remarkably like the human fingertip, providing for a grasp that is simultaneously gentle yet firm with tactile touch information and real time responsiveness.

Tactile Fingertips, though extremely sensitive (routinely to 0.05 Newtons and to 0.005 N in max sensitivity mode), also have a wide pressure range, up to 45 N (10 Pound-force) and over with high linearity. Because the elastomeric sensing pads provide a soft compliant interface, the point of contact does not apply excessive force, allowing for gentle object handling and control of the force applied to the object. The Tactile Fingertip can also detect a change in pressure location on its surface, i.e., directional glide provides real time feedback, making it possible to detect and prevent slippage by then proportionally adjusting the grip strength near instantaneously for perfect grip and for object identification along with the analysis of good grip (position, grip force, angle, any slip or wobble) and immediate correction for pick-and-place, unstructured bin sorting, and other applications.

Physical AI-ML can be used to train humanoid hands for more complex tasks. Skin-like touch can be added anywhere on the robot, even in low light or no light conditions, for controlled operation and safety.

Intelligrasp™ is a suite of programs for the gentle handling of objects.

Smart Grip™ grips object gently and then increases grip force if it detects any incipient slip. Incrementally increases force relative to degree of slip until a stable grip is detected.

Tactile Grip™ grips objects to a designated degree of deformation.

Position Grip™ moves to a specific position or depth and communicates the sensing data, which can be used to determine the shape or softness of the object being handled. Is the fruit ripe?

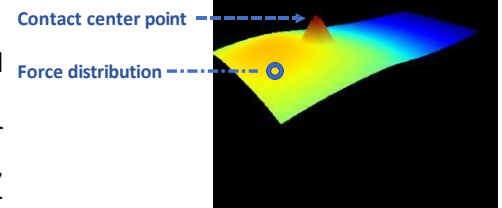
Tactile Release™ releases the object once detected external force reaches a designated threshold, which can be used for stacking, binning/kitting, human-robot interactions, and hand-offs.

These unique Tactile Fingertip touch sensing systems reduces the need for expensive visual and 3D sensing tools as well as the need for tool changes when changing objects or processes and allow for the gentle handling of objects without having to sacrifice time. Protects humans, objects, and your hardware.

Safety: Tactile TouchSkin™ on robot arm



Gripping intensity Force: 97 angle: -15.9°
Orientation X: 6.8 mm Y: 25.3 mm
Position



Ras Labs

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Sensing Properties	Minimum	Maximum	Accuracy	Unit
Position (X and Y)	0	18(X), 36(Y)	1	mm
Width	0	36	4	mm
Angle	-45	45	5	degrees
Slip	0	10,000	50	µm
Data Rate		100		Hz


Packaging Characteristics*		Unit
Finger pad hardness/durometer	Available in 35 to 60	Shore OO
Finger dimensions (L x W x H)	48 x 32 x 28	mm
Finger weight	< 21	g
Finger pad (sensing area) dimensions	36 x 16 x 3	mm
Ingress protection (IP) rating	52	IP

* Other packaging dimensions, shapes, hardness, or IP available. Contact us for details.

Operating Conditions	
Power supply	5 V
Power consumption	< 0.1 W
Operating temperature	0 – 45 °C
Relative humidity (non-condensing)	0 – 95 %
MTBF (operating life)*	> 20,000,000 cycles

* Fatigue testing is combination of pick-and-release and shear. Depends on force and surface characteristics. Contact us for details.

Interfaces

Interfaces	
Software Interfaces	<ul style="list-style-type: none"> ○ ROS ○ Local TCP
Electric Interfaces	<ul style="list-style-type: none"> ○ USB ○ Modbus RTU (RS-485)
Compute engine	<ul style="list-style-type: none"> ○ Linux ○ Windows
Gripper Adapter Plate	 <p>Default is a single M5 Bolt. Finger adapter plates are available for many commercial grippers. The CAD design is also available for custom adapter designs. Contact us for details.</p>