ENGINEERING DOCUMENTATION

Core Multidimensional Tactile Sensor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SN-C00-S004-V002	DRAFT-08 / 25 Aug 2026	Engineering Integration Reference

Integration Overview

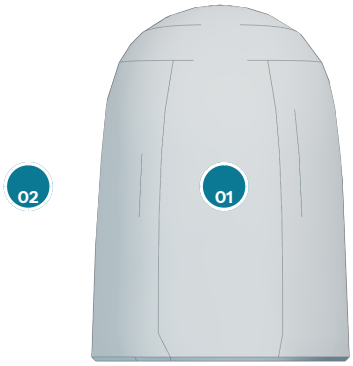
Compact multidimensional tactile sensing component for distributed contact-force acquisition and resultant-load monitoring. This guide supports mechanical placement, sensing-surface protection, wiring planning and signal commissioning for ES-SN-C00-S004-V002.

Key Integration Facts

INTEGRATION ITEM	PUBLISHED VALUE
Dimensions	18 × 13 × 10 mm
Surface Coverage	Front face and side curved edges
Force Signals in Array	51 signals
Normal Force Range (Fz)	0–25 N
Tangential Force Range (Fxy)	±10 N
Measurement Accuracy	1 %FS
Minimum Detectable Force	0.01 N
Maximum Output Frequency	1,000 Hz
Maximum Operating Current	200 mA
Operating Temperature	0–50 °C
Ingress Protection Rating	IP68

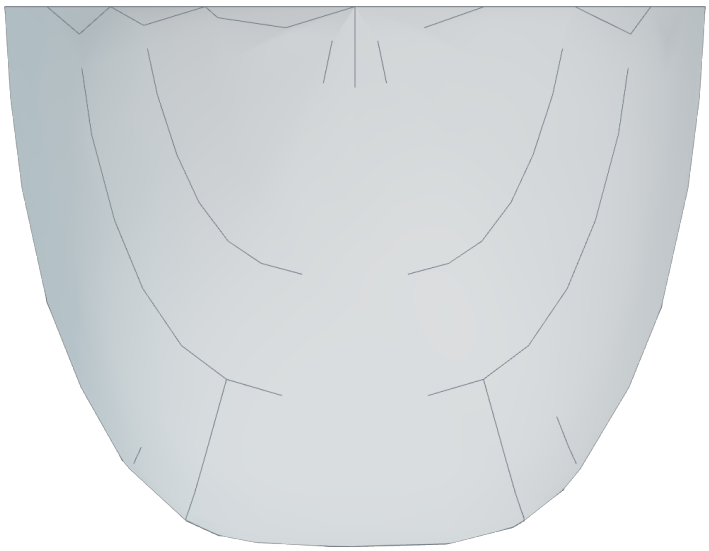
Annotated 3D Orientation and Interface Views

Orthographic 3D views identify the product body, primary interface and mounting relationships for ES-SN-C00-S004-V002.



Front View

Right Side View



Top View

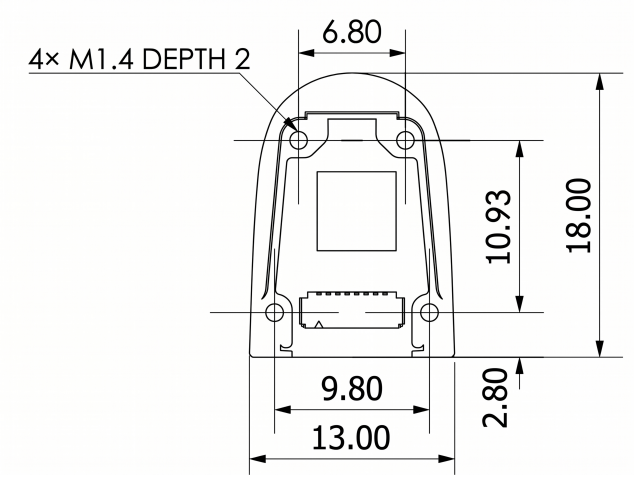
Numbered references identify the principal interfaces used by the integration sections.

Functional Callout Schedule

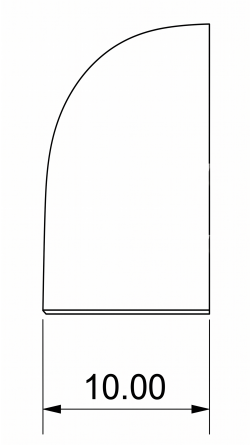
REF.	VIEW	INTEGRATION REFERENCE
01	Front View	Primary product envelope
02		Primary interface
03	Right Side View	Mounting and locating interface

Product Structure & Views

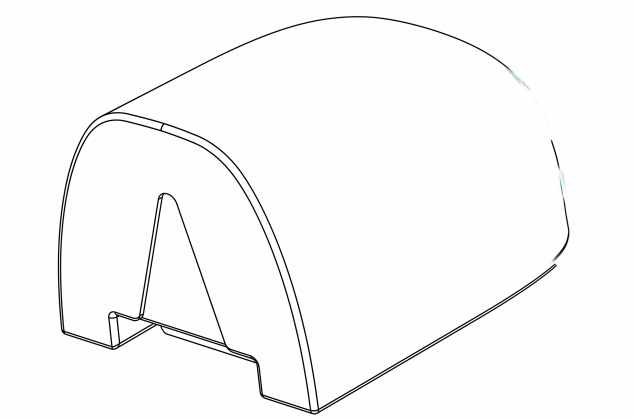
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



Mechanical View 1



Mechanical View 2



Mechanical View 3

VIEW	FIELD	VALUE
Mechanical View 1	Upper mounting hole horizontal center distance	6.80 mm
	Threaded hole specification and depth	4 × M1.4 threaded holes, depth 2 mm
	Overall height	18.00 mm
	Mounting hole vertical center distance	10.93 mm
	Lower mounting hole center to bottom reference distance	2.80 mm
	Overall width	13.00 mm
Mechanical View 2	Side profile width	Width = 10.00 mm

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Dimensions	18 × 13 × 10	mm

- Mounting features, locating geometry and face relationships are governed by the 2D views. Do not infer tolerances, thread engagement or assembly compression from the overall envelope.
- Support the assembly through its defined mounting features. Prevent installation or operating loads from bearing on the sensor housing outside the intended sensing surface and mounting locations.

Tactile Surface and Coordinate Frame

PARAMETER	PUBLISHED VALUE	UNIT
Surface Coverage	Front face and side curved edges	
Measurement Output	Triaxial force array, triaxial resultant force, and triaxial torque	

- Align host coordinates to the exact sensing-surface axes shown in the applicable product documentation. Confirm sign convention and channel mapping during commissioning before interpreting distributed or resultant load data.
- Keep the sensing elastomer free from sharp contact, cutting, folding, deep indentation and uncontrolled high-speed impact. Apply contact within the defined sensing-surface boundary.

Force and Measurement Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Normal Force Range (Fz)	0–25	N
Tangential Force Range (Fxy)	±10	N
Measurement Accuracy	1	%FS
Measurement Repeatability	<0.5	%FS
Minimum Detectable Force	0.01	N
Spatial Resolution	0.1	mm
Safe Load	200	%
Shock Overload	300	%
Mechanical Cycle Life	>10 million measurement	cycles

- Keep local and distributed loads within the published exact-SKU ranges. After a shock or overload event, remove the load, inspect the sensing surface and verify the unloaded baseline and channel response before returning the assembly to service.

Connector, Pin Assignment and Data Interface

PARAMETER	PUBLISHED VALUE	UNIT
Maximum Operating Current	200	mA
Maximum Output Frequency	1,000	Hz
Measurement Sampling Frequency	1,000,000	Hz

- Before energizing the assembly, verify supply polarity, current capacity, data-line assignment and reference return against the applicable pin assignment for the exact ordered configuration.
- The interface architecture provides multiple serial communication paths. Select one qualified path and obtain the matching specified pin assignment and protocol revision before host-board final integration.
- Provide strain relief and route flex or cable connections so that mating and cable loads are not transferred into the sensing elastomer, housing or mounting interface.

Signal Commissioning

PARAMETER	PUBLISHED VALUE	UNIT
Measurement Output	Triaxial force array, triaxial resultant force, and triaxial torque	
Maximum Output Frequency	1,000	Hz
Measurement Sampling Frequency	1,000,000	Hz

- With the sensor unloaded and the final mechanical installation complete, perform the supported baseline or zero procedure before recording reference data.
- If unloaded readings are unstable, remove unintended pressure points and nearby magnetic or electrical interference before repeating baseline calibration.
- Apply a small specified load at known sensing locations and confirm channel order, coordinate sign, resultant-load behavior and host display mapping before system-level commissioning.

Operating and Ingress Conditions

PARAMETER	PUBLISHED VALUE	UNIT
Operating Temperature	0–50	°C
Overload Temperature	-20–120	°C
Ingress Protection Rating	IP68	
Stray Magnetic Field Resistance	Chip-level magnetic resistance	
Flame Retardancy Rating	V-0 (UL94)	

- The published component ingress rating does not establish the protection rating of the complete host assembly. Validate the sensing boundary, mating interface, cable entry and enclosure sealing for the intended exposure.

Ingress Boundary Conditions

BOUNDARY	PUBLISHED CONDITION	INTEGRATION REQUIREMENT
Sensor component	IP68	Apply only to the exact supplied configuration and within the applicable environmental limits.
Connector and host assembly	System-level rating not established by the component rating	Seal and validate the mating interface, cable entry and enclosure during integration planning for damp or liquid exposure.

Cleaning and Handling

- During storage and transport, protect the sensing surface from compression, severe vibration, sharp objects, liquid exposure and uncontrolled temperature or humidity.

Surface Care Conditions

AREA	PERMITTED CARE	AVOID
Sensing elastomer	Lift loose dust gently; use a soft, non-abrasive wipe when required.	Sharp tools, deep indentation, aggressive abrasion and unapproved solvents.
Housing	Use a soft dry or water-based wipe.	Alcohol, organic solvents and non-polar solvents on the housing.

Integration Checklist

01	Confirm that the mechanical, electrical and interface data all identify ES-SN-C00-S004-V002.
02	Verify overall envelope, mounting features and sensing-surface boundary against the current 2D data.
03	Keep housing, cable and mounting loads out of the sensing surface and prevent installation preload.
04	Verify the exact pin assignment, supply polarity and host current capacity before power is applied.
05	Qualify one interface path and confirm its specified protocol revision and channel mapping.
06	Provide strain relief without loading or folding the sensing component.
07	Confirm coordinate sign and channel order with a small specified load at known sensing locations.
08	Zero or baseline the installed sensor in an unloaded, interference-specified state.
09	Validate local and distributed loads against the published normal, tangential, safe-load and shock limits.
10	Validate sensing-surface protection, connector sealing and host-enclosure ingress performance as a complete assembly.
11	Confirm that the cleaning method is compatible with the sensing elastomer and housing materials.
12	Request current 2D, STEP, pin-assignment and interface data before design freeze.

View SKU Product Datasheet **Request controlled 2D drawing** **Request controlled STEP review** **Request a Quote**

Engineering Use and Verification Notice

01. This Dimensional & Integration Guide applies only to EmbodyStack SKU ES-SN-C00-S004-V002 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing and must not be used as the sole basis for machining, tooling, tolerance allocation, pin assignment, wiring final integration, safety validation, enclosure certification or integration planning. during integration planning, verify all dimensions, mounting interfaces, sensing-surface boundaries, coordinate definitions, load limits, channel mapping, cable and adapter configuration, power delivery, grounding, ingress conditions, cleaning compatibility and environmental limits against the applicable EmbodyStack engineering data for this exact SKU. Where this guide and applicable product documentation differ, the applicable product documentation governs. Validate the complete host assembly under its intended loads, environment, duty cycle and applicable regulatory requirements.

specified Resources