ENGINEERING DOCUMENTATION

Six Axis Force Sensor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SN-C30-S001-V003	DRAFT-08 / 25 Aug 2026	Engineering Integration Reference

Integration Overview

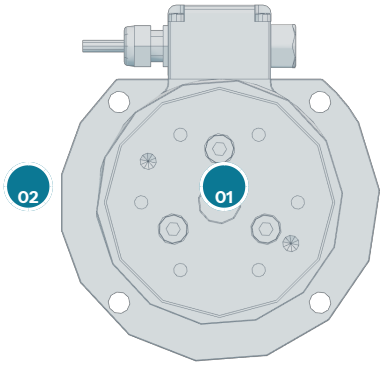
Six-axis force/torque sensing component for measuring three orthogonal force components and three orthogonal moment components. This guide supports mechanical layout, wiring planning and signal commissioning for ES-SN-C30-S001-V003.

Key Integration Facts

INTEGRATION ITEM	PUBLISHED VALUE
Dimensions	87 × 78 (diameter) × 28.5 mm
Mass	502 g
Measurement Axes	6 axes
Force Range (Fxy)	1000 N
Force Range (Fz)	1400 N
Torque Range (Mxy)	30 N·m
Torque Range (Mz)	30 N·m
Communication Interface	Ethernet; EtherCAT; RS-485; analog output
Operating Temperature	-10 to +55 °C
Ingress Protection	IP65; IP67 customization available

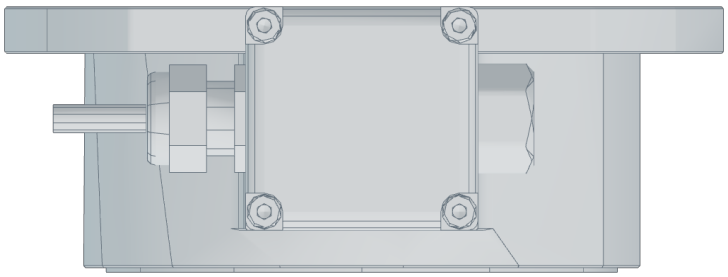
Annotated 3D Orientation and Interface Views

Orthographic 3D views identify the product body, primary interface and mounting relationships for ES-SN-C30-S001-V003.



Front View

Right Side View



Top View

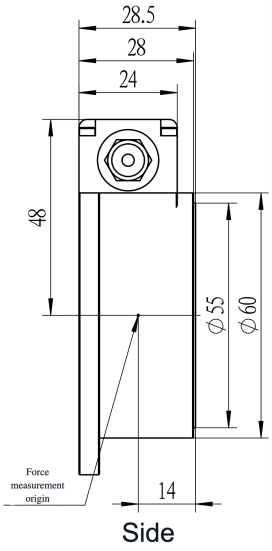
Numbered references identify the principal interfaces used by the integration sections.

Functional Callout Schedule

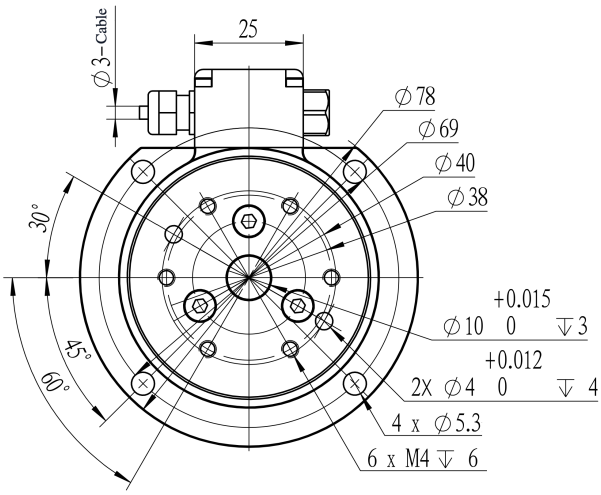
REF.	VIEW	INTEGRATION REFERENCE
01	Front View	Primary product envelope
02		Primary interface
03	Right Side View	Mounting and locating interface

Product Structure & Views

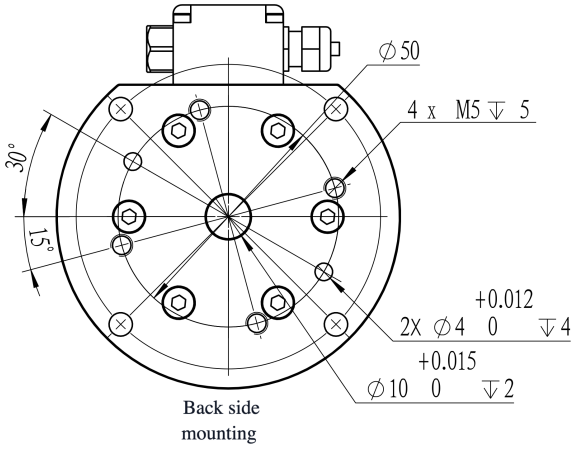
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



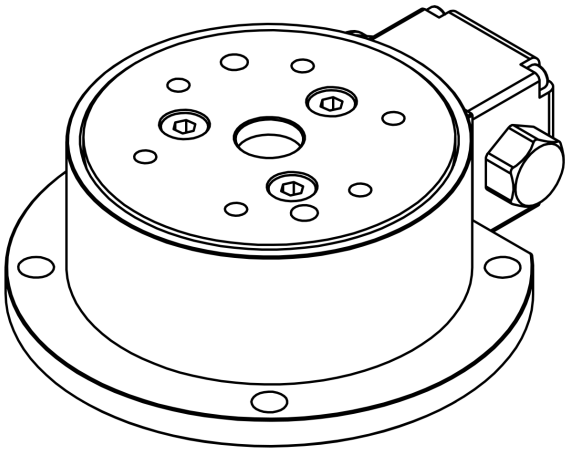
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

VIEW	FIELD	VALUE
Mechanical View 1	Top maximum width	28.5 mm
	Top intermediate width	28 mm
	Top inner width	24 mm
	Inner cylindrical diameter	Diameter 55 mm
	Outer cylindrical diameter	Diameter 60 mm
	Bottom horizontal offset distance	14 mm
	View label	Side view
Mechanical View 2	Top feature width	25
	Outer diameter	Diameter 78
	Mounting hole pitch circle diameter	Diameter 69
	Inner circular step diameter	Diameter 40
	Inner diameter	Diameter 38
	Hole angular spacing	30 degrees
	Central hole diameter and tolerance	Diameter 10, tolerance +0.015/0, surface finish 3
	Hole angular spacing	45 degrees
	Two hole diameter and tolerance	2x diameter 4, tolerance +0.012/0, surface finish 4
Mechanical View 3	Mounting hole pitch circle diameter	Diameter 50
	Back mounting tapped holes	4 × M5 tapped holes, depth 5
	Angular spacing dimension	30 degrees
	Angular spacing dimension	15 degrees
	Dowel/pin hole diameter and tolerance	2 × diameter 4, upper tolerance +0.012, lower tolerance 0, finish/depth mark 4
	Central hole diameter and tolerance	Diameter 10, upper tolerance +0.015, lower tolerance 0, finish/depth mark 2
	View label	Backside mounting view

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Dimensions	87 × 78 (diameter) × 28.5	mm
Mass	502	g

- Mounting holes, locating features and face geometry are governed by the 2D views. Do not infer thread engagement, mounting torque or manufacturing tolerances from the overall envelope.

Load and Measurement Coordinate Frame

PARAMETER	PUBLISHED VALUE	UNIT
Measurement Axes	6	axes

- The measurement data set comprises Fx, Fy, Fz, Mx, My and Mz. Establish the host transform from the exact coordinate origin and axis directions in the applicable product documentation and calibration data.

Force/Torque Measurement Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Force Range (Fxy)	1000	N
Force Range (Fz)	1400	N
Torque Range (Mxy)	30	N·m
Torque Range (Mz)	30	N·m
Resolution (Fxy)	0.01	%FS
Resolution (Fz)	0.01	%FS
Resolution (Mxy)	0.01	%FS
Resolution (Mz)	0.01	%FS
Nonlinearity	1.25	%FS
Axis Crosstalk	2	%FS
Overload Capacity	350	%

- Loads within the published overload capacity may still change sensor parameters. After an overload event, verify zero and measurement behavior before returning the assembly to service.

Connector, Cable and Data Interface

PARAMETER	PUBLISHED VALUE	UNIT
System Architecture	Digital output with adapter	
Communication Interface	Ethernet; EtherCAT; RS-485; analog output	

INTERFACE	CONNECTOR / PHYSICAL LAYER	AVAILABILITY / FUNCTION
Ethernet		
EtherCAT		
RS-485		
Analog output		

External Connector Type	Cold-pressed terminal	
Power Consumption	0.5	W
Maximum Output Data Rate	2000	Hz

- Select and qualify one output path for the ordered configuration. The published interface list represents available architecture choices and must not be interpreted as simultaneous native interfaces.
- Before energizing the assembly, verify power polarity, data-line assignment and shield termination against the applicable wiring documentation for the selected interface path.
- Provide strain relief and route the cable so that cable loads are not transferred into the sensing body or mounting interface.
- Qualify the required output rate with the selected interface and host acquisition path; use the published exact-SKU interface-specific limit where one is provided.

Operating and Ingress Conditions

PARAMETER	PUBLISHED VALUE	UNIT
Operating Temperature	-10 to +55	°C
Ingress Protection	IP65; IP67 customization available	

- The product ingress rating does not establish the protection rating of the complete host enclosure. Validate cable entry, mating interfaces and enclosure sealing in the final assembly.

Ingress Configuration Conditions

CONFIGURATION	PUBLISHED CONDITION	INTEGRATION REQUIREMENT
Standard configuration	IP65	Use this rating only for the exact standard SKU configuration and validate sealing in the final host assembly.
Custom ingress configuration	IP67 option available by confirmation	Do not assign IP67 to this SKU unless the ordered configuration and applicable product documentation explicitly confirm it.

Mounting & Signal Commissioning

- Align the mating faces and avoid installation preload, bending or forced fit that could bias the unloaded output.
- After power-up, allow 10-20 minutes for thermal stabilization before final zeroing or baseline recording.
- After mechanical installation and thermal stabilization, perform the supported zeroing procedure and confirm unloaded outputs before commissioning.

Integration Checklist

01	Confirm EmbodyStack SKU ES-SN-C30-S001-V003 and the exact 2D package before laying out the host interface.
02	Confirm the mounting face, hole pattern, locating features and required installation clearance.
03	Confirm that the host does not introduce preload, misalignment, bending or cable force into the sensing body.
04	Confirm the selected output architecture, power path, wiring assignment, grounding and shield strategy.
05	Confirm the required output rate against the published exact-SKU and interface-specific limits.
06	Confirm the operating temperature and the standard ingress condition for the ordered configuration.
07	Allow thermal stabilization, perform zeroing and record the unloaded baseline after installation.
08	Define an inspection and re-verification action after any overload event.
09	Request current 2D, STEP and wiring documentation before final design or integration planning.

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-C30-S001-V003 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, wiring final integration, safety validation, enclosure certification or integration planning. during integration planning, verify all dimensions, mounting interfaces, coordinate definitions, load limits, cable and adapter configuration, power delivery, grounding, ingress conditions 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