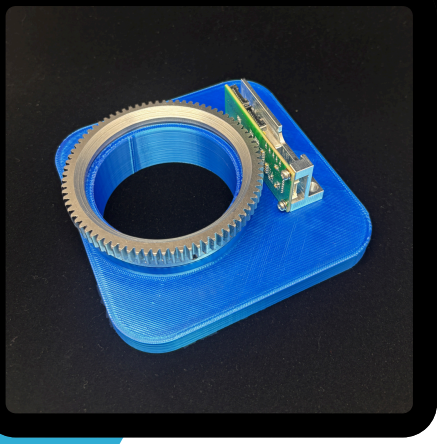
SENSOR LAB.

Gearcoder



Hollow multi-turn absolute position encoder for robots

V10_202503

SENSORLAB

- Development and production of various types of position sensors, optimized for robotic and servo applications.
- Expertise in producing ultra-precise encoders.
- Magnetic and inductive linear encoder development.
- Support for BiSS C, RS485 communication protocols.
- Custom design of sensor interface modules and data converters.

Why Choose Gearcoder ?

- Customizable disk design
- Large hollow disk supported with no Initial tooling costs
- Single-cable connection for up to six sensors
- High resolution up to 25 Bits with a gear disk(scale)
- Multiturn absolute position sensing with 20 Year battery life
- Integrated funcitonal safety
- Multi-color LED indicators for status and errors

Key Features

Multi-turn Absolute Position Sensing

- Employs a battery-buffered sensing system supporting both single-turn and multi-turn modes.
- Maximum resolution up to 25 bits (single-turn).
- Long battery life of 10–20 years under typical usage.

Gear-Based Hollow Scale System

- Customizable No. of teeth and disk size
- Compatible with large through-hole configurations
- Self-manufacturable disk and gear with no initial tooling cost
- Highly resistant to demagnetization and external magnetic interference

Multi Slaves (BiSS C)

- Connects multiple sensors via a single cable
- Supports daisy-chaining of up to 8 sensors (6 recommended for optimal performance; typical speed: 2.5 Mbps, communication time <100 µs)

High-Speed Serial Communication

- Supports BiSS C protocol
- Achieves up to 10 Mbps with a single sensor

Easy Assembly and Environmental Durability

- Resistant to dust, water, shock, and vibration
- Includes functional safety features
- Equipped with multi-color LED indicators

Various Standard Disks (Scales)

- Standard disks available with 32, 60, 64, 80 teeth and more
- Supports up to 50 mm hollow shaft diameter (with 102 mm outer diameter, 100 teeth)

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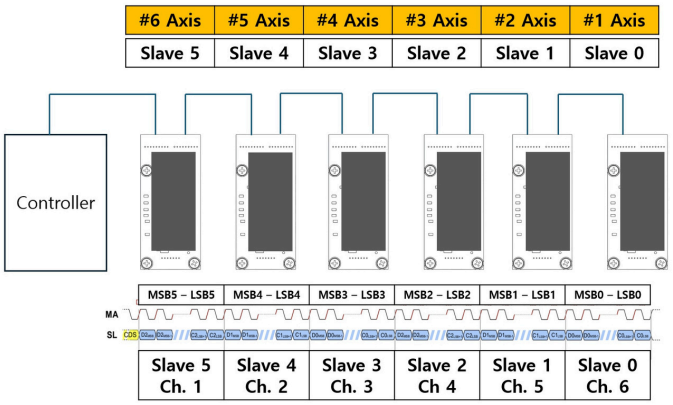
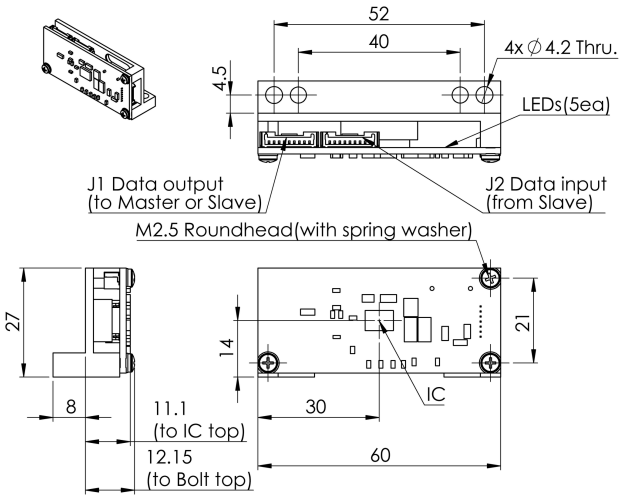
Technical Specifications

Parameter	Specification	Notes
Operating Voltage	5V±10%	-
Operating Current	≤150mA	-
Battery Voltage	3.6V±10%	-
Battery Current Consumption	Typical 30μA	>10 years battery life under test conditions
Operating Temp.	0~85℃	No condensation
Storage Temp.	-20~100℃	-
Resolution	~25bit	in manual
Max Speed	6000rpm	Depends on peripheral devices
Output	BiSS C (default), RS485 (custom)	Differential output
Cable Length	Up to 100m (1 sensor) 20m (6 sensors)	-
Vibration/Shock Resistance	5G/10G	60Hz~1000Hz, 5ms
LED sign	White: Power, Green: Normal operation, Red: General error, Blue: Battery warning, Yellow: Magnetic sensing error	
Max communication speed	2.5 : 6 sensors 10MHz : 1sensor	Varies depending on cable length
Max number of sensors	Up to 6	Up to 8 later

How to connect multiple sensors



Dimensions



Tolerances for assembly	Specifications
Air gap (gear-to-IC surface)	0.4~0.6mm
Center offset (C)	±0.1mm
Height offset (H)	±1mm(Do not get off)
Parallelism	±0.1mm

Product Configuration (Model Code)

Model	Location awareness		Gear Teeth Count	Module Size	Single-turn Resolution	Multi-turn Resolution	Output Format	Year Code, Serial Number
GC	X	-	XX	X	X	X	B	XXXXX
Gearcoder	A : Absolute (Battery-buffered) I : Incremental	-	Rotary XX : Number of gear teeth (hex for values ≥100) Linear 00	5 : 0.5 7 : 0.7 8 : 0.8 1 : 1.0 2 : 1.25 A : 1.5	Rotary 9 : 19bit 0 : 20bit 3 : 23bit Linear A : 0.1um B : 0.5um 1 : 1um	Rotary 0 : None 8 : 8bit 6 : 16bit A : 20bit B : 24bit Linear 0	B : BiSS C	X : Year 4 : 2024 5 : 2025 XXXX:Serial Number 4-digit hex