

Motorsport Wheel Gun Position Sensor

Quantum TMR Linear Position Sensor

The Motorsport Wheel Gun Position Sensor is a solid-state, programmable linear position sensor leveraging the latest advancements in Tunnel Magnetoresistance sensing to ensure that single lug wheel nuts are secured correctly during rapid pit stops. With a programmable 45mm sensing range, the instrument delivers dependable readings by detecting the position of a plunger, fitted with magnet target, within a customised socket.

Compared to torque sensors which may show false readings when wheel nut misalignment or cross-threading occurs, TMR technology measures the physical distance of the plunger relative to the sensor measurement heads installed in the shroud, ensuring the correct fitment every time.

Featuring three precise measurement heads designed to be bonded within the wheel gun housing, non-contact measurement is made continuously with readings extracted from the electronics control module positioned at the rear of the device offering integrated CPU processing for a CAN or analog VDC output. With an IP rating of IP67, the sensor is equipped to excel in extreme environments and temperatures with an operating temperature range of -40°C to $+150^{\circ}\text{C}$.



Exploded view including plunger and wheel nut



Sensor measurement heads fitted within shroud



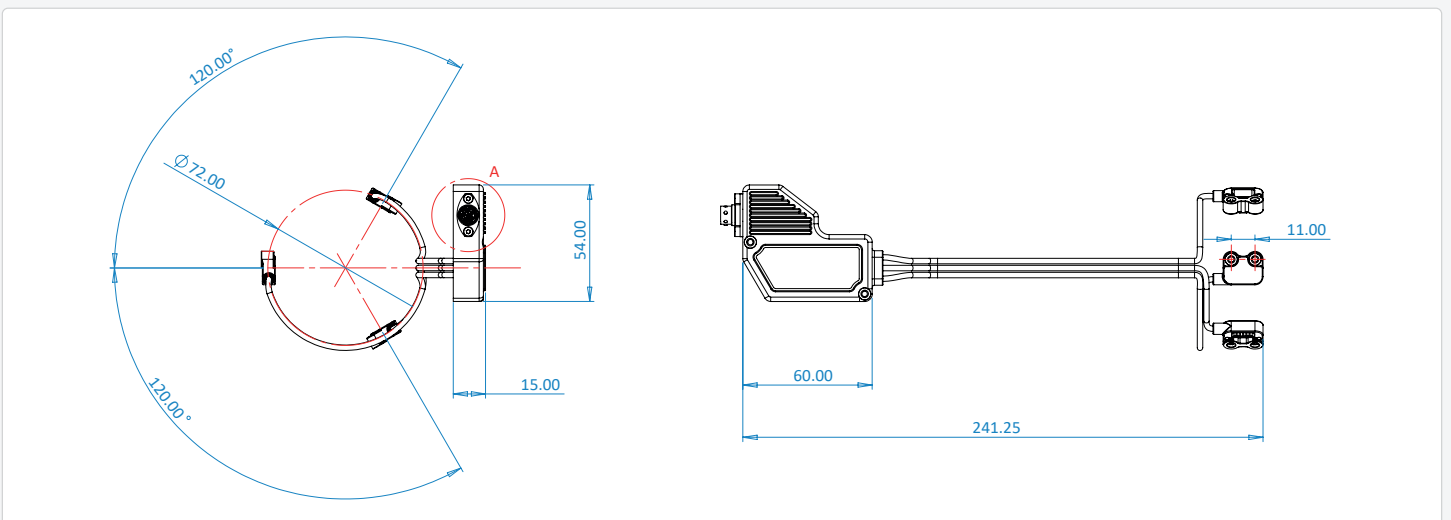
Lightweight electronics and measurement heads

Key Features

- Solid-state, non-contact alternative to potentiometers
- Rapid response rate of 5kHz
- Extremely accurate; $\pm 0.5\%$ of reading
- 45mm linear reprogrammable measurement sensing range
- 12bit Analogue VDC output resolution
- Accurate position sensing over a wide temperature range of -40°C to $+150^{\circ}\text{C}$
- IP67 rated to measure in extreme environments

- Provides real-time measurement of component movement.
- Full customisation available.

Example Sensor Dimensions



Measurement

Type	Linear Displacement
Typical Accuracy	±0.5% of reading
Measurement Rate	5kHz
Measurement Range	45mm (Reprogrammable range)

Electrical

Supply Voltage	+6VDC to +31VDC
Typical Operating Current	<45mA at +12 VDC

Analog Output

Type	Voltage
Output Range	0.25 VDC to 4.75 VDC (Configurable)
Resolution	12 bit
Stability	±0.4% full scale output

Environmental

Environmental Protection	IP67
Vibration	Designed to meet: 10Hz to 2000Hz sine sweep @10G (24hrs per each axis)
Shock	Designed to meet: 50G half sine wave for 11ms, 10 times each axis
Operating Temperature Range	-40°C to +150°C

Mechanical

Shroud Construction Material	Carbon Graphite
Standard Electronics Mass	From 51g
Standard Shroud (Inclusive of electronics)	From 340g

Wiring Specification

Harness	Deutsch ASX-002-05-PN-HE, Custom available on request.
Sleeve Elastomer	RW-200E
Boot Elastomer	Viton FEP
Wire Type	Type 55, 26 AWG (see drawing)

Wiring Definition

Description	PIN Out
Supply (+)	1
Ground (GND)	2
Signal (0.25-4.75V)	3
Tx Comms 1 (Configuration only)	4
Rx Comms 1 (Configuration only)	5

Configuration Interface

Type	RS-232 via FTDI USB cable. See Accessories.
GUI	Available on request

Specifications may be subject to change without prior notice.