

**NOVOTURN  
Multi-turn Sensor  
Non-contacting**

**MC1-2800**



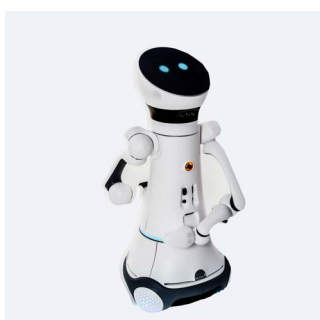
**Turn with Confidence  
Our Ultra-compact Multi-turn Sensor  
MC1-2800**

- Non-contacting, magnetic
- Long life
- Measuring range 15840° (44 turns)
- True-Power-On system: counts turns even when not powered. Non-volatile technology does not require gears or batteries
- Available with push-on coupling or marked shaft
- Easy mounting
- Protection class IP54 up to IP67
- Resolution up to 16 bits per revolution
- Smart sensor functions for condition monitoring



#### Applications

- Mobile machinery
- Valves and actuators
- Printing and paper processing machines
- Drive or steering systems
- Lift platforms
- Door and gate drives
- Robotics
- Wire-actuated encoders
- Motor sports
- Replacement for wirewound potentiometers or encoders



(Images: stock.adobe.com)

#### A Compact and Cost-Efficient Solution for Many Applications

Today's multi-turn sensors may be associated with some application-specific disadvantages: Cost-efficient multi-turn potentiometers often do not meet the requirements in regards to resolution and reliability.

Optical encoders are too costly and too large for many applications, while geared solutions are prone to wear and tear. A new generation of multi-turn sensors solves these issues by way of the GMR effect.

The rotary multi-turn sensor MC1-2800 provides absolute position data over several revolutions at high-resolution, in the form of a linear signal. Its non-contacting principle of operation eliminates wear and tear as well as the need for a buffer battery. As a "True-power-on" system, it provides the measurement immediately upon startup. Any rotation occurring within the measuring range is detected even when no power is applied.

This rotary sensor offers a highly compact solution, in many instances eliminating the need for convoluted, unreliable, or high-maintenance solutions, thus helping to lower the bottom line.

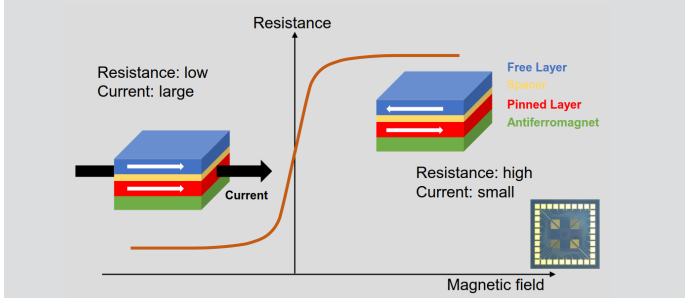
#### GMR Technology

Revolution detection and storage do not require an electrical power source, since the device relies on the micro-magnetically-based GMR effect (Giant Magneto Resistance Effect). Owing to this effect, the electrical resistance of a GMR sensor's layered structure is determined by the mutual magnetic orientation of the individual layers.

#### From the GMR Effect to the Multi-turn Rotary Sensor

Attached to the sensor's rotating shaft is a magnet. During the rotation, it changes the magnetization of a specially-designed GMR sensor element.

Each individual magnetization state is measured for electrical resistance and associated with a unique rotational position with the help of a suitable algorithm. When combined with a 360° measuring sensor, it is possible to measure the absolute rotational position over several revolutions.



### A Tiny Giant

The highly-compact multi-turn sensor MC1-2800, with its diameter of only 30 mm is also suitable for adjustment angles of less than 360°. When applications with tiny mounting spaces call for capturing the rotations of a drive shaft, this can be translated via a significantly smaller gear wheel to the rotary sensor, which is mounted offset from the axis.

### True-Power-On System

With the help of the GMR technology, it is possible to detect and store up to 44 revolutions - without an external power supply or a buffer battery. Even during power outages, the measured position data remains intact. At the same time, these sensors are highly precise. The linearity deviation is below  $\pm 1^\circ$  over the entire measuring range.

### Robust

As this sensor is also very robust, it is suitable for many off-road applications as well. It complies with protection requirements of up to IP67, meaning it is protected against dust and temporary submersion. Neither do impacts and vibrations affect its functionality in any way.

- Miniature design
- Sensor housing made of high grade, temperature resistant plastic
- Available with integrated plug-in coupling for easy coupling or marked shaft
- Elongated hole mounting for easy adjustment

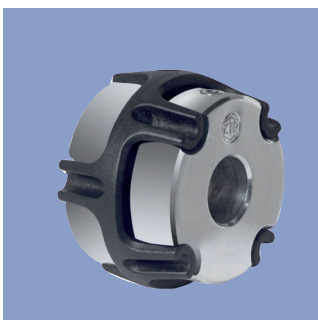
- Measuring range 15840° (44 turns)
- Linearity  $< \pm 1^\circ$
- Analog and digital interfaces (ratiometric, CANopen, CAN SAE J1939, IO-Link)
- Resolution up to 16 bits per revolution
- Smart sensor functions for condition monitoring

- Long life
- Protection class IP54 up to IP67
- Operational speed up to 800 rpm
- Interference immunity up to 30 V/m according to ISO 11452-5
- Batch traceability of sensor assembly and sensor components



Installation examples

### Recommended Accessories



- Low backlash and backlash-free shaft couplings in various designs (double cardanic, fork coupling, spring washer coupling etc.)



- Mating cables and adapter cable M12 in various lengths



## Ordering Specifications

### Preferred types printed in bold

- Delivery time up to 25 pcs. within 10 working days EXW
- Best low-volume pricing

### Interface

6\_ : CANopen

J\_ : CAN SAE J1939

A\_ : IO-Link

2\_ : Ub = 5 VDC, 5 ... 95%/10 ... 90% ratiometric to Ub (0.25 ... 4.75 VDC/0.5 ... 4.5 VDC)

### Electrical connection

2\_ : Cable, 4-pole, L = 0.5 m, 1 m, 3 m, 5 m

5\_ : Connector M12x1, 4-pin/5-pin, with cable, L = 0.15 m

**M C 1 - 2 8 3 2 - 2 4 4 - A 1 1 - 2 5 2**

Series

### Mechanical version

2802: 6 mm shaft with flattening, IP54

**2832: 6 mm shaft with flattening, IP65**

2862: 6 mm shaft with flattening, IP67

2821: push-on coupling, IP54

**2841: push-on coupling, IP65**

2871: push-on coupling, IP67

Other shaft configurations on request

### Number of turns for output characteristic

#### Analog interface

001 ... 044: 1 up to 44 turns

#### Digital interface

244: 44 turns

CANopen

A7F: 44 turns, Node ID 127

For more information and detailed ordering specifications, see <https://www.novotechnik.de/en/products/rotary-sensors-linear-position-transducers/>

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Your contacts can be found at <https://www.novotechnik.de/nc/en/service/representatives/>

## Technical Support

Do you need further technical information?

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