

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

**MZ1-2200**



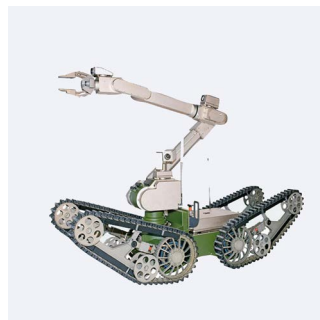
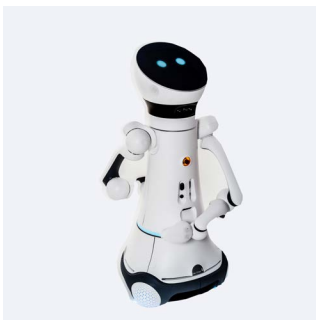
**Minimum size with maximum precision:  
Multi-turn Sensor with Bushing Mount  
MZ1-2200**

- Non-contacting, magnetic
- Long life
- Housing diameter only 22 mm
- Measuring range 15840° (44 turns)
- True-Power-On system: counts turns even when not powered. Non-volatile technology does not require gears or batteries
- Easy mounting via bushing mount
- Protection class IP50 and IP65, electronics encapsulated
- Resolution 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 MZ1-2200 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.

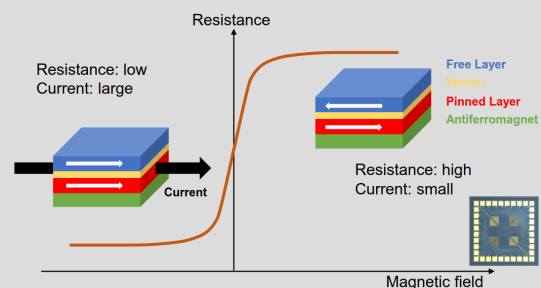
#### GMR Technology

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.



### Easy installation

The multiturn sensor is particularly suitable for use in very confined installation spaces due to its extremely small design with a diameter of just 22 mm. The MZ1-2200 “accelerates” in command devices and in motorsports or precisely records the position in actuators.

- Miniature design with 22 mm outer diameter
- Bushing, M10 x 0.75 for easy installation
- Sensor housing out of high grade, temperature resistant plastic
- Customized options of shaft design or electrical connection

### True-Power-On System

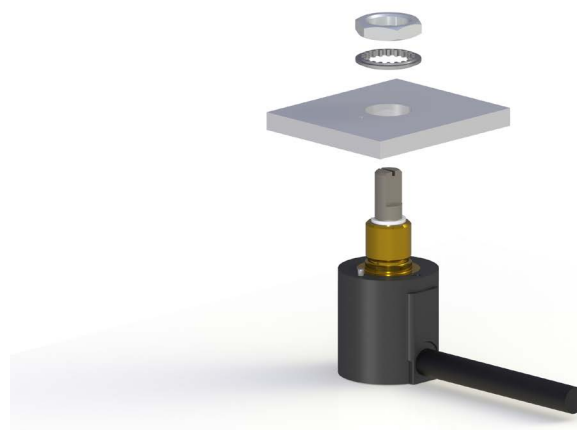
With the help of the GMR technology, it is possible to detect and store up to 44 revolutions - without an external power supply or a buffer battery. Even during power outages, the measured position data remains intact. At the same time, these sensors are highly precise. The linearity deviation is below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

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

### Well equipped

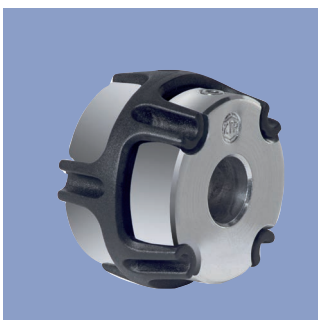
The MZ1-2200 is available in 2 different protection classes. The variant with sealing and completely encapsulated electronics meets all requirements for demanding environmental conditions with IP65. Thanks to its excellent EMC robustness, the sensor is able to use in mobile applications.

- Long life
- Protection class IP50 and IP65
- 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

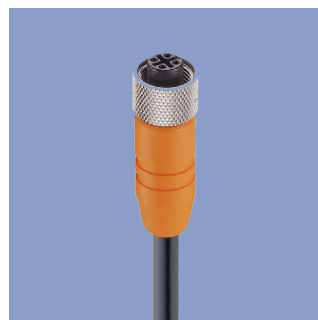


Installation example

### Recommended Accessories



- Low backlash and backlash-free shaft couplings in various designs (double universal joint, 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 = 1 m

5\_ : Connector M12x1 with cable, L = 0.15 m

**M** **Z** **1** - **2** **2** **1** **1** - **A** **7** **F** - **6** **1** **4** - **2** **3** **2**

Series

Number of turns for output characteristic

Analog interface

001 ... 044: 1 up to 44 turns

IO-Link, CAN SAE J1939

244: 44 turns

CANopen

A7F: 44 turns, Node ID 127

### Mechanical version

**2201: Bushing, M10 x 0,75 thread, 6 mm shaft, IP50**

**2211: Bushing, M10 x 0,75 thread, 6 mm shaft, IP65**

2221: Bushing, M10 x 0,75 thread, 6 mm shaft, IP50, with index pin

2231: Bushing, M10 x 0,75 thread, 6 mm shaft, IP65, with index pin

Other shaft configurations on request

For more information and detailed ordering specifications, see <https://www.novotechnik.com/salessupport.php>

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