



Linear and Rotary Sensors

Non-contacting position sensing has become an established technology for industrial automation and mobile applications.

Robustness, speed, accuracy, and - especially in view of Industry 4.0 - communications capabilities are important key words in this context.

Demanding customer applications and the requirements of tomorrow are the foundation for continuous optimization and further development of our product range.

Novotechnik presents a number of innovations and advancements of sensors at SPS IPC Drives 2016.

- **IO-Link - An Interface for the Future**

In order to facilitate the easy and cost-effective interlinking of sensors and control units in the framework of Industry 4.0: Linear and rotary sensors with IO-Link interface

- **Highly Dynamic Inductive Linear Position Sensor**

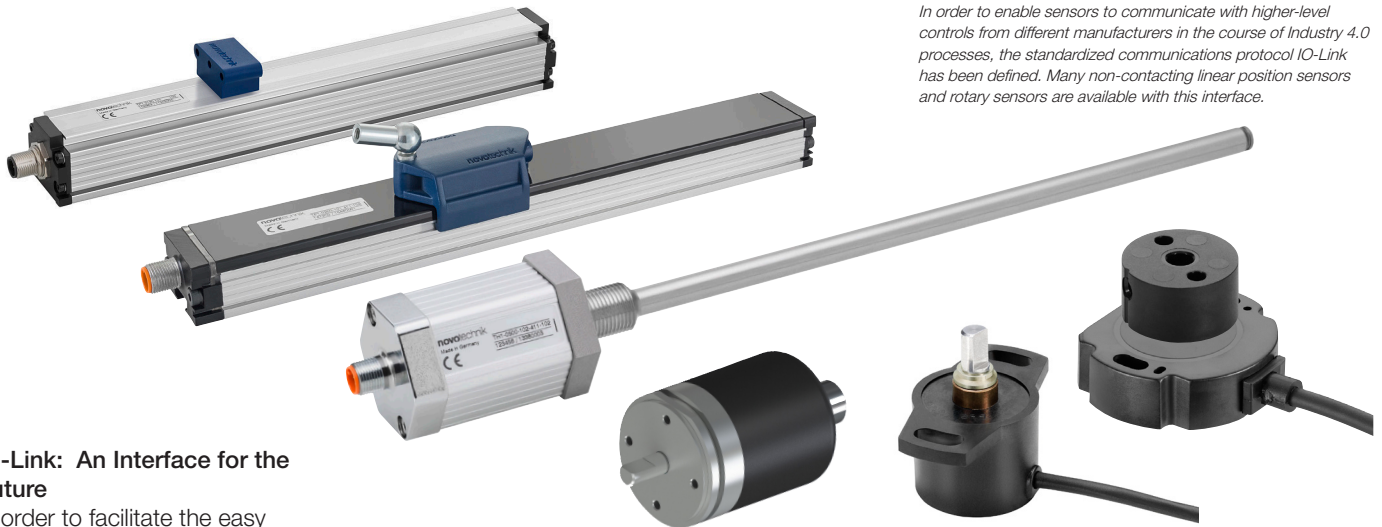
Predestined for quick positioning tasks:
Induktive linear transducer TF1

- **Robust Rotary Sensors for Mobile Machinery**

Rough operating conditions, compact installation space, safety-related applications but always reliable measuring results:

Rotary sensors series
RSA-3200 and RFE-3200

Industry 4.0 - Sensors for easy Connection to Control Systems



In order to enable sensors to communicate with higher-level controls from different manufacturers in the course of Industry 4.0 processes, the standardized communications protocol IO-Link has been defined. Many non-contacting linear position sensors and rotary sensors are available with this interface.

IO-Link: An Interface for the Future

In order to facilitate the easy and cost-effective interlinking of sensors and control units in the framework of Industry 4.0, the standardized communications protocol IO-Link has been defined. This offers several practical advantages:

The point-to-point connection offers field bus functionality at attractive prices, and enables uninterrupted control unit communications down to the sensor level. In particular the wiring - in comparison with Industrial Ethernet - is decidedly more simple and thus more cost-effective, since unshielded 3-wire leads as well as the M12 connector system are supported.

On activation, the user can easily modify parameters, such as zero point or the direction of rotation, in order to reduce diversity of variants. In addition to purely positional data, additional data, such as status or diagnostics messages can be exchanged. Control circuit errors are quickly identified, thanks to the central storage of setup parameters. Sensor replacements can be accomplished in little time.

Thus, IO-Link ultimately facilitates cost reductions for automation technology as well as engineering. By now, many sensors are offering these advantages to the user.

This year, at Nuremberg, we present linear position sensors and rotary sensors that are available with IO-Link: This includes linear sensors, such as the highly-dynamic inductive linear position sensor TF1, as well as rotary sensors, such as the robust Single- and Multiturn transducers of the RSC-2800 and RSB-/RMB-3600 series.

The magnetic sensors of the RSC-2800 series have proven themselves in many industrial and mobile applications, by now. They are compact, easy to install, and capture the rotation angle over the entire 360 degrees, at a resolution of up to 14 bits. The Single- and Multiturn sensors of the RSB-/RMB-3600 series are robust single- oder multi-channel

designs with full metal casings measuring only 36.5 mm in diameter and featuring durable ball bearings. Other examples of sensors featuring IO-Link are the absolute, magnetostrictive linear position sensor TH1 (rod-style transducer) suitable for direct integration in cylinders as well as the also magnetostrictive linear position sensor TP1 (profile-design transducer).



The new inductive linear position sensor TF1 is based on the touchless Novopad process. This sensor shines with exceptionally good dynamic characteristics and its high mechanical and magnetic robustness.

Highly Dynamic Inductive Linear Position Sensor

The inductive linear position sensor TF1, available in standard lengths of 100 mm to 1000 mm is virtually predestined for quick positioning tasks.

The measuring system's update rate is up to 10 kHz, resulting in a time delay of 0.2 ms between actual position and corresponding measurement value. Improved control dynamics eliminate overshooting even with rapidly changing movements. At the same time, the sensor offers resolutions of up to 1 micrometers.

Some examples of typical applications are: linear drives, injection molding and die-casting equipment, presses and punches for sheet metal processing, packaging or wood processing equipment, and position sensing in rapid motion units of production lines.

And the Novopad technology is non-susceptible to the magnetic fields generated by large motors, hydraulic valves, or magnetically actuated clamping mechanisms, for instance. This holds true because the position sensing is achieved through

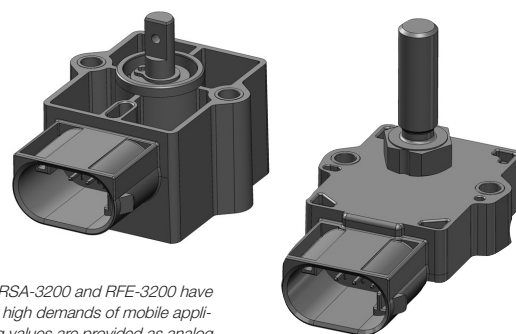
the application of inductive rather than magnetic principles. Another advantage for the field of metal processing is the fact that metal shavings will not accumulate at the non-magnetic sensor. Position markers are available in guided designs for coupling to driving rods, and in non-guided designs for mechanical decoupling.

Owing to the robust sensor design – with the measuring scale embodied in a circuit board – even strong vibrations will not interfere with the measuring results. What's more, the sensor covers a wide temperature range of -40 to +85° C. The measurement signal is provided as an analog current/voltage signal, or in digital form via SSI. Additionally, IO-Link or CANopen standard communication interfaces are available; an Ethernet interface will be following later.

Robust Rotary Sensors for Mobile Machinery

Mobile machinery for construction, agriculture, and forestry, as well as pallet trucks are placing high demands on sensors, due to their outdoor use. However, in addition to reliable functionality under rough operating conditions, further characteristics are usually required, e.g. compact design where installation space is tight, and redundancy for applications where safety is of concern; and last but not least, the cost factor frequently plays a significant role. The magnetic rotary sensors of the RSA-3200 and RFE-3200 series have been developed specifically with these requirements in mind.

They are available in a shaft design (RSA) as well as in a non-contacting design with separate position marker (RFE). Both designs have been optimized for the requirements of mobile applications and tested to the most stringent of EMC standards, such as ISO-pulses and high disturbances according to ISO 11452. The positional values are provided as analog current or voltage values; a CANopen interface is also available. In addition, single- oder multi-channel designs are available. The latter are suitable for applications where safety is a concern, as in PLd / Cat. 3 according to DIN EN ISO 13849).



The compact sensors RSA-3200 and RFE-3200 have been optimized for the high demands of mobile applications. The measuring values are provided as analog current or voltage values, or via CANopen interface.



Wherever precise determinations of positions and angles are required, sensors from Novotechnik are the first-choice solution. The measuring technology expertise that we have gathered in the course of 65 years constitutes just one of the secrets behind a success story that began back in 1947:

The other cornerstones of our success include a passion for technology and an obsession with precision and reliability. Then, there is our love of solution-oriented thinking, coupled with a fascination with new materials and production methods. And of course, there is our constant awareness of the importance of providing sound advice and top-class service, complementing our overall goal of continuous improvement of our measuring systems.

The greatest secret of our success, however, has been the passionate pursuit of the best possible solution for each individual customer application. And to ensure that we remain the first-choice partner for our

customers, we will continue to focus on the strengths that made us the successful company that we are today.

Leading OEMs from a whole spectrum of industries put their trust in position transducers and rotary sensors made by Novotechnik: be it general engineering, hydraulics, pneumatics, measuring technology, medical technology or automotive engineering. And, talking of the automobile industry, every day more than 50,000 of our sensor components are installed into new cars.

Representatives worldwide

Today, Novotechnik is represented in all of the world's major markets - be it with our own subsidiaries or by approved dealers. Wherever our customers will be, thanks to this tightly-knit network we can ensure that, they can rely on first-class service and customer care.

Your contacts can be found [www.novotechnik.de / service](http://www.novotechnik.de/service).