

Application brief

Beyond transmission applications

XENSIV™ magnetic speed sensors as general purpose sensors

If there is something that characterizes transmission speed sensors (TSS) it is their robustness and flexibility.

Infineon transmission speed sensors are able to provide direction information and reliably detect rotations down to 0 Hz. The slim package and the flexibility to sense different magnetic field components (top and side read capability) make them the perfect fit for applications with space constraints. XENSIV™ magnetic speed sensors are available with/without back bias magnet and developed to work accurately in harsh environments.

Transmission speed sensors are designed to face several challenges e.g.: large air gaps ranges, gear eccentricity, air gap shocks, vibrations, high temperatures and temperature changes, and many other challenging conditions, for that reason TSS are very robust and reliable sensors. They are capable to perform at every type of wheel geometry and can easily address different applications.

For hydraulic machines such as forklifts, harvesters and in general commercial, construction and agricultural vehicles (CAV) this is a significant advantage because reliable performance over different wheel shapes is required. The vibration suppression and the sudden air gap jump capability makes Infineon TSS a perfect sensor solutions.



More and more the automotive industry moves towards electrification, thus robust against stray field transmission speed sensors are essential. Our Infineon products are per design the perfect fit in supporting these requirements. Homogeneous magnetic signals reaching the sensing elements get canceled by the differential principle. In addition to stray field immune sensors Infineon's wide and stable product portfolio, includes sensor solutions with integrated capacitor to ensure the fulfillment of industries newest EMC and ESD requirements.

www.infineon.com/magnetic-speed

Key challenges

- Large air gap range
- Air gap jump shocks
- Vibrations
- Stray fields
- Gear shape
- Space constraint

Key sensor requirements

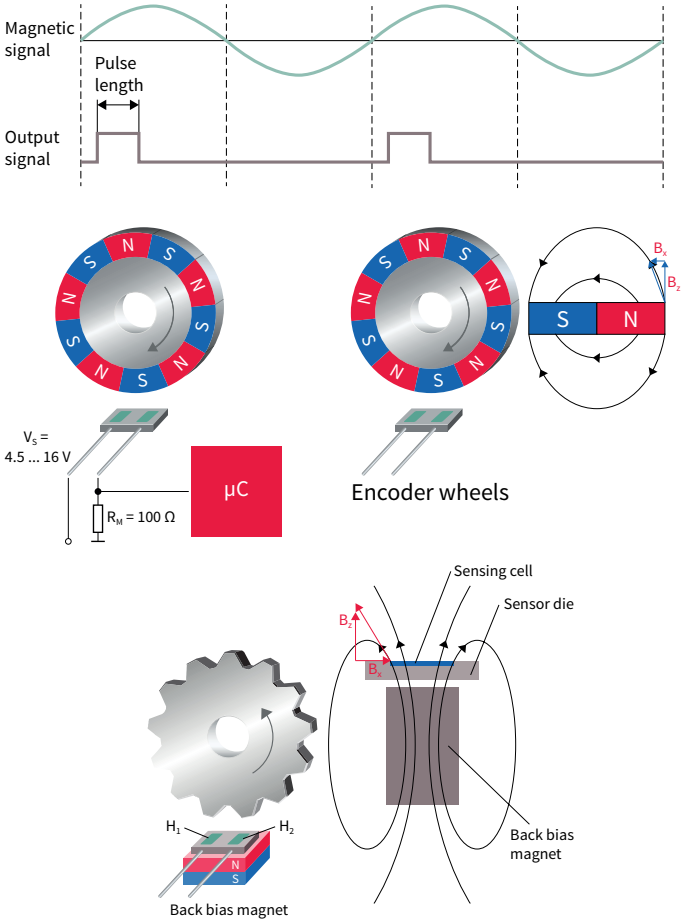
- High sensitivity
- Sudden air gap jump capability
- Vibration suppression
- EMC robustness
- Low jitter
- Slim sensors
- Top and side read capability
- Zero-Hertz capability

That could be an advantage in applications as coolant pump and fans for cooling and air conditioning purposes. Infineon speed sensors could support the fast setting of the right required speed, increasing efficiency and energy recuperation. The required performance can be reached without additional passive components, resulting in cost savings. A possible application might also be Tachographs, in which magnetic speed sensors could properly support new concepts. High sensitivity sensors able to cancel disturbances but also mono-cell with twist independent mounting capability. It is especially suitable in case of sensors threaded into gearbox housing (the sensor is screwed with not defined angle of final installation relative to the target wheel)

Infineon broad portfolio of magnetic speed sensor addresses different applications

Furthermore magnetic speed sensors are the perfect fit for non-automotive applications, like in a computer mouse, for the inherent capability to sense different wheel geometries. Here, magnetic speed sensors are able to accurately sense the small scroll wheel, wherein direction detection is available to detect scrolling forward or backward. Button clicks suddenly change the distance between the sensor and the wheel, in which case, the sudden air gap change capability ensures that no pulses are missed.

As presented, Infineon's broad portfolio of magnetic speed sensor is dedicated to address several applications, ranging from classical automotive ones to the consumer area. Flexible and robust products being qualified to work accurately with any kind of wheel geometry make it possible. 2-wire current interface and 3-wire voltage interface sensor are available and the Infineon long-term availability of products ensure sustainable long-term business at our customers.



XENSIV™ magnetic speed sensors

Product	OPN	Description
TLE4953C	SP001952920	Differential speed sensor family with 2-wire current interface. Direction detection via PWM protocol and active vibration suppression. Sudden air gap jump capability. Available version with and without capacitor on the leads.
TLE4955C/Ex	SP001952972	Differential speed sensor family with 2-wire current interface. Direction detection and active vibration suppression. Sudden air gap jump capability and integrated capacitor. Additional PWM protocols available as product derivatives.
TLE4941plusC	SP001952932	Differential magnetic speed sensor with 2-wire current interface and integrated capacitor on the leads.
TLE4959-5U FX	SP001040496	Differential speed sensor family with 2-wire current interface. Direction detection and active vibration suppression. Sudden airgap jump capability. Additional PWM protocols available as product derivatives via EEPROM programming.
TLE4922-XAN-F	SP001106758	Low cost 3-wire voltage interface which can easily be configured as 2-wire current interface sensor with twist independent mounting capability.

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