CUSTOMER REFERENCE

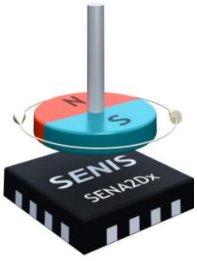
SENIS
magnetic & current measurement

SENIS AG, Switzerland develops, manufactures and supplies advanced sensors and instruments for magnetic field and electric current measurement as well as the corresponding development and engineering services.
Our solutions and services help our clients in the automotive, consumer electronics, test and measurement industries, as well as to research institutes to create powerful, robust and effective products.

SENIS® Fast Magnetic Angle Sensor (FAMAS) SENA2Dx is an integrated magnetic field sensor that allows the measurement of the rotation angle of the in-plane components of a magnetic field, such as that of a permanent magnet attached on-axis to a rotating shaft1. The co-integrated signal processing circuit represents a servo loop to track the external field which directly converts the angular position of the magnetic field to digital information. Thus, the angular position of the magnetic field, rotation direction, and angular velocity are available after less than 1 µs delay time. There are three modes of operation available - fast, balanced and high resolution – to offer optimal performance for the required application. FAMAS received the AMA Innovation award 2020: https://www.senis.ch/news-events/latest-news .

www.senis.ch

ETH zürich Robotic Systems Lab



Accurate
- Highest angular resolution (<0.08°)
- The fastest response (latency <0.6us)
- Highest rotational speed (up to 400'000 rpm)
- Largest magnetic field ranges (20mT...up to 500mT), therefore immune to stray fields
- On-chip correction of sensitivity, offset, noise, drift

Affordable
Solution that allows very competitive price due to:
- small chip size
- standard Si CMOS technology
- no wafer postprocessing required
- no need for additional A/D converter and angle calculation

Feature-rich
- New, patented angle sensor concept
- Instantaneous angle information (rotary position)
- Constant and changeable rotary speed measurement
- End-of-shaft & Out-of-shaft sensor
- High sensor spatial resolution => works with various magnet sizes
- On-chip parametrization
- SPI, A quad B, UVW outputs

At the **Robotics Systems Lab, ETH Switzerland**, various self-developed motor drives for robot arms and walking robots are developed (https://rsl.ethz.ch/robots-media/anymal.html). In these applications, the **SENIS® FAMAS absolute angle sensor** can satisfy some requirements, which could not be reached with previously applied magnet-based absolute encoders.

"The requirements for use in the motor drive robot applications include among others a high magnetic resolution, i.e. a low-noise measured value – and this requirement could not be satisfied with previously applied magnet-based absolute encoders", says **Lennart Nachtigall, Robotic Systems Engineer, ETH Zurich.**