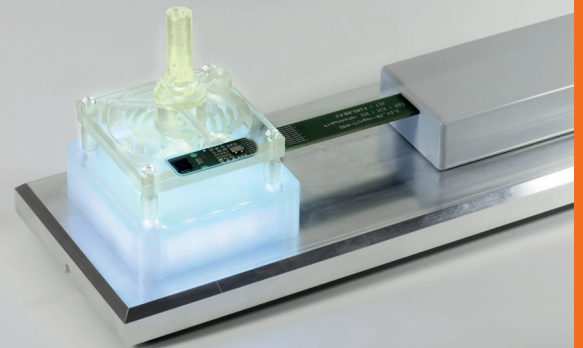


2



Prototype of a 6D measuring system:

- 1 CAD model
- 2 Real execution

HALLINMOTION – 6D position measurement with HallinOne®

Reliable, robust, precise – the special properties of the HallinOne® technology and the smart evaluation of algorithms mean that up to six mechanical degrees of freedom can be determined with just a single IC.

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Mode of operation

“HallinMotion,” the algorithm developed at Fraunhofer IIS for multidimensional position measurement, allows all six mechanical degrees of freedom with a single measurement system for the first time.

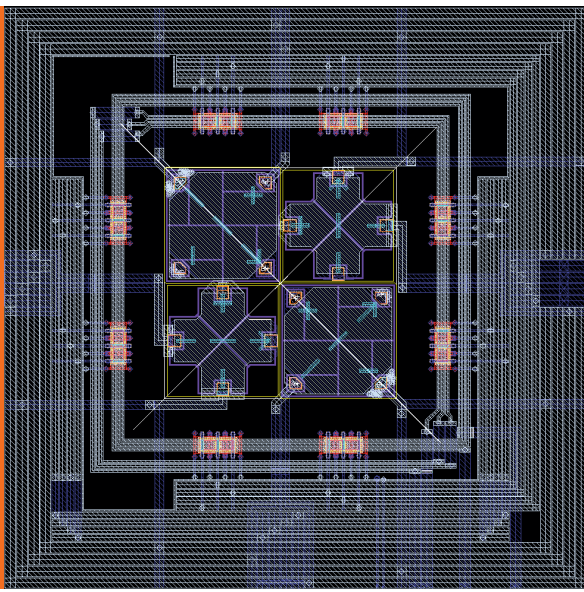
The measuring system, which comprises a magnet and a sensor chip, allows very high measurement rates with maximum precision. It offers robust resistance to variations in temperature and external magnetic fields.

The new algorithm can be also be used where the precision of existing 1D or 2D systems is impaired by disruptive lateral motion. This allows existing applications to be made more robust and simpler.

Smart self-monitoring also means that it can be used in safety-critical applications.

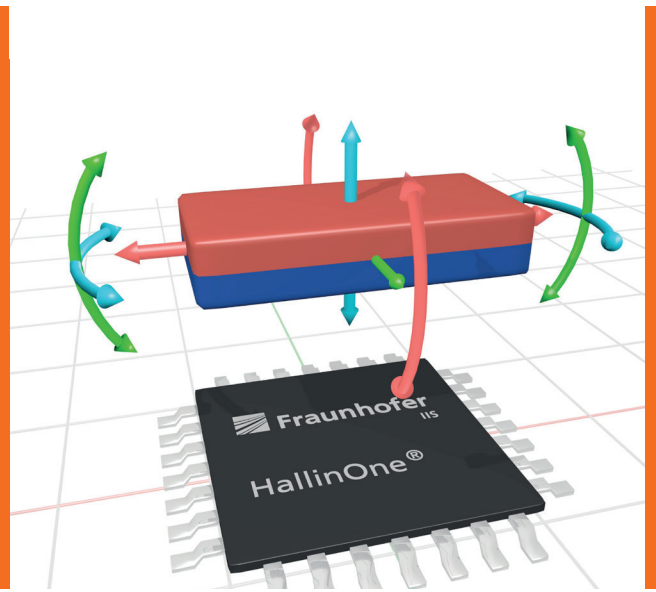
Features

- Contactless absolute position measurement (even through non-magnetic materials)
- Higher degree of positional accuracy due to capturing rotary and lateral motion
- Independent of temperature and external magnetic fields
- Cost-effective due to the integration of the sensor in CMOS technology
- Self-monitoring by means of integrated coils on the sensor chip
- Precision down to the micrometer rang



3

3 Pixel cell (3D magnetic field sensor) of the HallinOne® technology



4

4 Six degrees of freedom of movement

6D application examples

- Control elements in the areas of automotive, household devices, and construction and agricultural machines (use in safety-relevant applications and tough environments such as dust, dirt, and vibration)
- Chassis monitoring systems
- Robotics
- Control of CAD applications
- Monitoring of high-precision motion sequences down to the micrometer range
- Multi-sensor applications replaced by a single sensor IC

Characteristics

Typical measurement data for a real application:

Sampling rate:

f: 100 Hz

Range of motion:

X,Y: -5 to 5 mm

Z: 3 to 5 mm

α, β : -20° to 20°

\varnothing : -90° to 90°

Precision:

X,Y,Z: approx. 0.05 mm

$\alpha, \beta, \varnothing$: approx. 1°

Our offering

- Investigation and drawing-up of system concepts
- Analysis and reduction of the effect of rotary and lateral motion in position systems
- Feasibility study
- Safety analyses (FMEA, FMEDA, safe failure fraction)
- Development of customer-specific hall sensor ICs (ASICs)
- Set-up of prototypes
- Transition to series production/qualification