

1 HallinSight® sensor array for in-plane vectorial magnetic measurements  
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## HallinSight® – VECTORIAL MAGNETIC FIELD IMAGING

Making the invisible visible – with three dimensional visualization of magnetic fields. HallinSight® stands for precise vectorial magnetic measurements with capabilities of highly flexible adaption to different requirements and applications like permanent magnet characterization and inspection of magnetic components.

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### Unique Vectorial Measurement

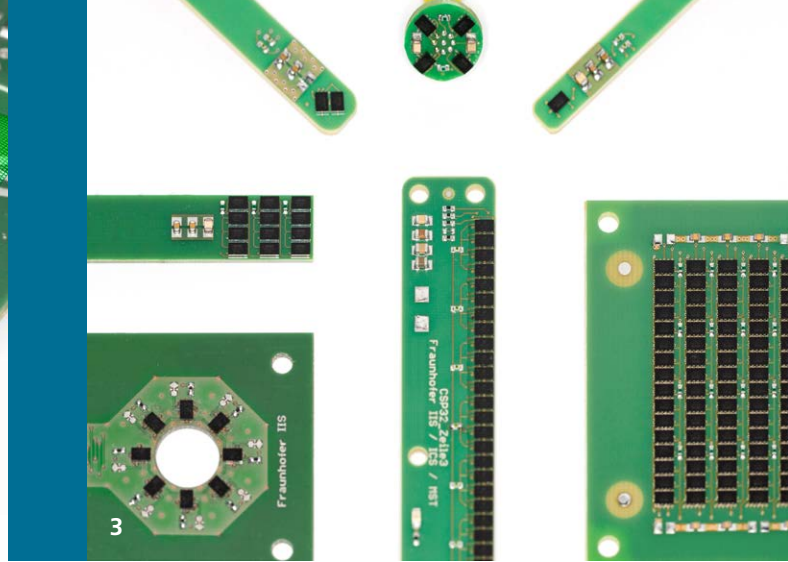
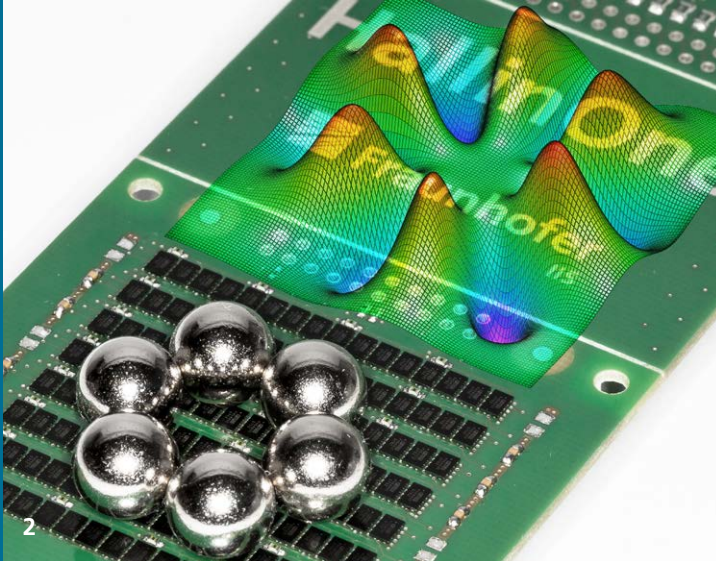
The HallinSight® vectorial magnetic field imaging technology enables measuring all three dimensions of magnetic fields in real time. The magnetic field vector can be dissolved with a magnetic resolution in the range of  $\mu\text{T}$  at a rate up to 1000 measurements per second.

In form of a planar array, the technology can be fabricated as a magnetic field camera and be used for characterization of static or dynamic magnetic fields. The high flexibility of the HallinSight® technology makes it feasible to measure magnetic fields along a line or in-plane as well as within a spatial volume.

Different communication interfaces are available for integration in existing environments for laboratorial and industrial setups.

### Applications

- Quality control in magnet fabrication
- Detection of defects in magnetic materials (e.g. cracks, cavities)
- Permanent magnet characterization (field strength, magnetization)
- Non-destructive material testing (magnetic back-bias)
- Multi-dimensional position measurements
- Metering of magnetic fields with high dynamics (e.g. gradient fields)
- Detection of hidden electric currents (e.g. solar panels)
- Visualization of static or alternating magnetic fields (e.g. motors, coils)



**2** Measurement result of multiple rare-earth magnets  
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**3** Different available sensor geometries and layouts  
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### Our services

- Off the shelf designs (single probes, linear and planar arrays)
- Adaption of measurement range
- Adaption of measurement rate
- Customized geometric dimensions and layout
- Combination with multi-dimensional position algorithms
- Customized algorithms for analysis of measurement results
- User-specific communication protocols
- 3D Helmholtz coils for calibration of magnetic systems

### Technical specifications

- Resolution 16  $\mu\text{T}$  (no avg.)
- Magnetic field range 0 ...  $\pm 100$  mT (typ.)
- Noise 30  $\mu\text{T}$  RMS (no avg.)
- Measurement rate up to 1000 Hz
- Operating temperature 10° C ... 30° C
- Absolute offset error < 25  $\mu\text{T}$  (typ.)
- Absolute gain error < 0.5% (typ.)
- Orthogonality error < 0.5°
- Lateral geometric position error < 80  $\mu\text{m}$
- Vertical geometric position error < 20  $\mu\text{m}$

### Features

- True 3D magnetic field measurement (vectorial)
- Integrated temperature sensor
- Magnetic calibration of complete measurement system
- Ready-to-use with USB interface
- LabVIEW software for visualization and analysis
- LabVIEW library for integration in existing measurement setups
- Space-resolved measurement in a 2.5 mm grid
- Interpolation algorithms for higher resolution
- Measuring distance to active sensor area < 0.5 mm
- Magnetically neutral measurement area
- Communication per USB or serial ASCII protocol

### Optional features

- Measurement range up to 4 T
- Measurement rate up to 10 kHz
- Extended temperature range -40° C ... 125° C
- Low construction height (< 1.5 mm)
- Additional algorithms for magnet characterization
- Customized interfaces