High resolution – high speed 3D magnetic field mapping and analysis

With the MagCam Measurement Platform, MagCam NV offers the world’s first magnetic field camera system. The unique MagCam sensor contains a patented sensor chip with an integrated two-dimensional array of over 16000 microscopic Hall magnetic field sensors. Each sensor independently measures the local magnetic field, resulting in a quantitative 3D magnetic field map (MagCam map) with high spatial resolution, measured at record speed: less than 1 second for a 13x13mm² map with 0.1mm resolution.

The fully digital and compact MagCam sensor module simply connects to your computer via a single USB cable, making the measurement data directly digitally available. The MagCam maps are analyzed in real-time by the MagScope measurement & analysis software and its optional add-on software modules, which provide powerful measurement and analysis capabilities for a complete characterization and quality control of permanent magnets. The MagCam system is optimized for small magnets (<10mm) both with uniaxial and multipole magnetizations, as used in e.g. sensor applications, small electric motors etc.

The MagCam Measurement Platform opens up a new dimension in R&D and quality control for sensor manufacturers, magnet producers, magnet suppliers, motor/generator constructors, research labs and more.

Features and Benefits

- No moving parts
- Absolute magnet positioning (with positioning frame)
- For uniaxial and multipole magnets
- Advanced data analysis capabilities
- Magnetization vector and skew angle measurements
- Multipole angle failure measurements
- N-S asymmetry and pole height uniformity measurements
- Magnet homogeneity inspection
- Magnetization/material defect detection
- Real-time quality control with pass/fail analysis
- Suitable for automation

Applications

- sensor magnet inspection
- sensor system R&D
- motor magnet inspection
- magnet manufacturing R&D
- magnetic assembly development
- incoming/outgoing magnet QC
- inline magnet QC
Powerful MagCam data analysis with MagScope and MagFit software

The MagCam Measurement Platform comes with the MagScope Measurement and Analysis Software. With MagScope you can record and analyze in real time the magnetic field maps measured from the MagCam sensor.

MagScope features include a high resolution interpolated quantitative color scale plot in both cartesian and cylindrical coordinates, cross-section analysis, absolute magnet position indication, absolute distance and angle measurements, image processing algorithms, statistical image analysis, import/export of MagCam data and screenshots, pass/fail quality control and more. Applications include multipole magnet angle failure measurements, N-S asymmetry inspection, magnet homogeneity testing or simply magnetic field mapping.

The optional MagFit Magnet Analysis Software module offers advanced MagCam data analysis capabilities for uniaxial and multipole permanent magnets. Based on theoretical magnet models, MagFit calculates a best fit to the measured MagCam map and can thus extract a lot of extra information from the data, such as the full magnetization vector, deviations from a ‘perfect’ magnet, the full B-vector field in 3D space, local defects in the magnetization or in the magnet material, the exact magnet position and orientation and more. All measured parameters can be used for a pass/fail quality control based on user-defined tolerances.

Both MagScope and MagFit are also available as Matlab toolboxes, allowing you to integrate and automate MagCam measurements and data analysis in your Matlab environment. Applications include automated inline quality control, large area scanning using robots/scanning stages etc.

MagCam hardware accessories include the Magnet Positioning Kit, which is a set of calibrated frames that can be easily mounted on the MagCam Sensor Module. When a magnet is placed against the frame, its exact position is known in the MagScope software.

---

MagCam Sensor Hardware Specifications

- On-chip integrated 2D array of Hall sensors
- Sensor array size: 128 x 128 = 16 384 sensors
- Pixel resolution: 0.1 x 0.1 mm²
- Field of view: 13 x 13 mm²
- Sensor – surface distance: down to 0.25 mm
- Measured magnetic field component: Bz
- Magnetic field range: ±500mT, ±1T, ±2T, ±4T, ±8T
- Magnetic field accuracy: 0.02% of range
- Measurement frequency: 1 – 20 frames / second
- Temperature compensated measurement
- Connection type: USB
- Enclosure material: hard anodized aluminum
- Enclosure size: 94mm x 71mm x 23mm
- Weight: 230g
- Enclosure equipped with threaded mounting holes

---

Products

MagCam Base Measurement Platform:
- MagCam Sensor Hardware
- MagScope Measurement & Analysis Software

MagCam hardware accessories:
- Magnet Positioning Kit

MagScope software options:
- MagFit Magnet Analysis Software
- MagScope for Matlab Measurement Toolbox
- MagFit for Matlab Magnet Analysis Toolbox

Services

Measurement Services
Feasibility Studies
Development Projects

Applications

Sensor magnet inspection
Sensor system R&D
Motor magnet inspection
Magnet manufacturing R&D
Magnetic assembly development
Incoming/outgoing magnet inspection
Inline magnet quality control