SENIS

magnetic & current measurement

Applications and Use Cases

of SENIS Magnetometers

MEASURE. CHARACTERIZE. OPTIMIZE.

Precision. Safety. Performance.

www.senis.swiss • SENIS Group, Switzerland

MONITOR. DETECT. PROTECT.

MAGNETIC FIELD TRANSDUCERS WITH HALL PROBE

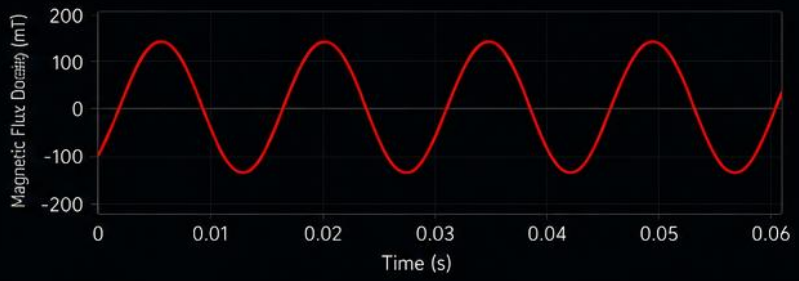
Continuous monitoring of rotor magnetic field in large electrical machines for early detection of faults and anomalies in mission-critical applications.

APPLICATION

Large electrical machines in hydro power plants (generators and motors) for reliable and continuous operation.

REAL-TIME MAGNETIC FIELD MONITORING

Measures the rotor magnetic field through the stator airgap.



DETECTS CRITICAL ANOMALIES

ROTOR SHORT CIRCUITS
Asymmetry in magnetic field waveform

EXCESSIVE VIBRATIONS
Fluctuations in field amplitude and frequency

AIRGAP ECCENTRICITY
Variation in field uniformity

BENEFITS

- ✓ Early fault detection
- ✓ Prevents unplanned outages
- ✓ Reduces maintenance costs
- ✓ Extends machine lifetime
- ✓ Improves plant availability
- ✓ Ensures operational safety

SENIS MAGNETIC FIELD TRANSDUCER

- High accuracy
- Wide frequency response
- Robust and reliable
- Easy to install
- Designed for harsh environments

WHY IT MATTERS

GRID RELIABILITY | MAXIMUM UPTIME | REDUCED MAINTENANCE | HIGH PLANT EFFICIENCY | SUSTAINABLE ENERGY

SENIS magnetic solutions

Advanced magnetic field monitoring for the reliability and safety of large electrical machines in hydro power plants.

MEASURE IT. MONITOR IT. PROTECT IT.

SENIS MAGNETOMETERS – ENSURING SAFETY, EMC & PERFORMANCE

Testing & monitoring magnets and magnetic parts in consumer electronics for a smarter, safer world

From R&D to production – SENIS magnetometers and transducers deliver precise magnetic field measurements for quality, EMC compliance and optimal performance.

APPLICATIONS IN CONSUMER ELECTRONICS

- Smartphones & tablets
- Smartwatches & wearables
- TWS earbuds & audio devices
- Haptics, speakers, microphones
- Wireless charging & power modules
- Magnetic connectors, covers & cases
- Electronic PCBs & components

WHY MAGNETIC TESTING MATTERS

- Ensure electromagnetic compatibility (EMC) & regulatory compliance
- Protect user safety from unwanted magnetic exposure
- Guarantee performance of sensors, audio, haptics & wireless systems
- Improve product quality, reliability & consistency in mass production

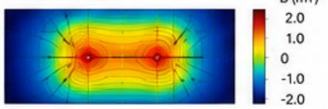
TYPICAL MAGNETIC PARTS IN DEVICES

TESTING FOR EMC & SAFETY

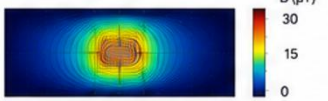
- Stray field analysis & mapping
- Magnetic field exposure compliance (ICNIRP, IEC 62311)
- Shielding effectiveness
- Crosstalk & interference between components
- In-line monitoring for production control

MEASUREMENT EXAMPLES

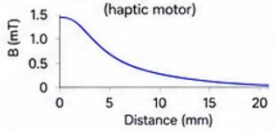
Magnetic field mapping of speaker magnet



Stray field around wireless charging coil



Magnetic field vs. distance (haptic motor)



SENIS SOLUTIONS – PRECISE, VERSATILE, RELIABLE

F3B Field Transducer
Ultra-high bandwidth for dynamic & pulsed field measurements (up to MHz range)

I3D Isotropic 3-Axis Transducer
True 3D magnetic field measurement for complex field analysis & mapping

3MH4 Teslameter
Versatile 3-axis teslameter for R&D, production & quality control

3MH1-E Teslameter
Compact 3-axis teslameter for small magnets & magnetic components

PRODUCTION & QUALITY ASSURANCE

- In-line & at-line testing
- 100% inspection capability
- Process monitoring & control
- Traceable results & data logging
- Easy integration (PLC, LabVIEW, API)

WORKFLOW – FROM DESIGN TO PRODUCTION

Design & Simulation → Prototype Testing → Validation & Compliance → Production Monitoring → Consistent Quality & Safe Products

TRUSTED BY LEADING COMPANIES WORLDWIDE

SENIS magnetometers are used worldwide by electronics manufacturers, EMS providers and R&D labs to ensure EMC compliance, user safety and peak performance in consumer electronics.

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Precision. Safety. Performance.

MEASURE. CHARACTERIZE. OPTIMIZE.

THRUSTERS THAT POWER THE FUTURE.

SENIS Mapper delivers high-precision magnetic field measurements and characterization of Hall effect thrusters for rockets and satellites.

COMPLETE 3D MAGNETIC FIELD MAPPING

High spatial resolution measurement

ACCURATE & REPEATABLE

Sub-mT accuracy with excellent repeatability

RAPID DATA ACQUISITION

Efficient scanning and powerful automation

BUILT FOR R&D AND PRODUCTION

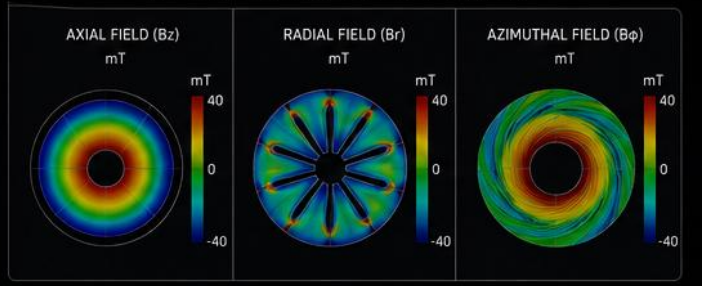
From development to quality control

ENGINEERED FOR HALL EFFECT THRUSTERS

Hall effect thrusters rely on precisely engineered magnetic fields for efficient ionization, stable discharge, and long life. Even small magnetic deviations can lead to performance loss, instability, and increased wear.

ROCKETS · SATELLITES · DEEP SPACE MISSIONS · ORBITAL MANEUVERING

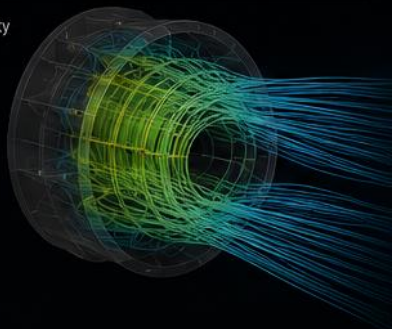
MEASURE. VISUALIZE. UNDERSTAND.



- ✓ Full 3D vector field measurement (Bx, By, Bz)
- ✓ High spatial resolution reveals critical magnetic features
- ✓ Identify asymmetries, field distortions and design weaknesses

COMPLETE THRUSTER CHARACTERIZATION

- Magnetic field distribution and uniformity
- Magnetic flux, topology and gradients
- Pole shape and position accuracy
- Field alignment and symmetry
- Magnetic circuit verification
- Design and simulation validation
- Performance optimization



THE SENIS MAPPER ADVANTAGE

OPTIMIZE PERFORMANCE
Improve thrust, efficiency and specific impulse by optimizing magnetic design.

REDUCE DEVELOPMENT TIME
Validate simulations and accelerate design iterations with accurate measurements.

INCREASE RELIABILITY
Ensure stable operation, reduce anomalies and extend thruster lifetime.

ENSURE QUALITY
Consistent production quality and validation for critical missions.

POWERING THE NEXT GENERATION OF SPACE SYSTEMS

LAUNCH VEHICLES · COMMUNICATION SATELLITES · DEEP SPACE PROBES

SENIS
magnetic solutions

ADVANCED MAGNETIC MEASUREMENT SOLUTIONS FOR SPACE PROPULSION INNOVATION

HIGH PRECISION SUB-mT ACCURACY · WIDE MEASUREMENT VOLUME · AUTOMATED & REPEATABLE · RUGGED & RELIABLE

MEASURE IT.
CHARACTERIZE IT.
OPTIMIZE IT.

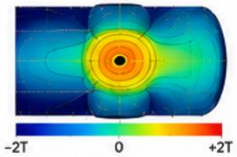
SENIS MAGNETOMETERS – ENABLING PRECISION IN MEDTECH

Measuring, testing and characterizing magnets, sensors and magnetic systems for life-changing technologies

SENIS teslameters (3MH6-E, 3MH4, 3MH1-E) provide unmatched accuracy and versatility for development, production and quality assurance in medical applications.

MRI SYSTEMS

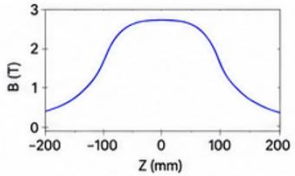
Measure and map static and gradient magnetic fields for MRI system optimization, shielding validation and regulatory compliance.



3D magnetic field mapping of MRI magnet

SUPERCONDUCTING MAGNETS

Characterize high-field superconducting magnets for research, NMR, and advanced medical imaging applications.



Axial field profile measurement

WEARABLE DEVICES & BIOSENSORS

Test and calibrate miniature magnets and magnetic sensors used in wearables, health trackers and biosensing devices.

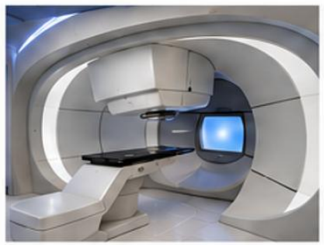
3MH1-E for high-resolution small magnet measurement

IMPLANTABLE HEART PUMPS

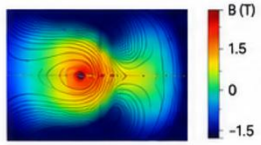
Ensure safety and performance of magnetic components in implantable and extracorporeal heart pumps and circulatory support systems.

Magnetic field measurement for heart pump components

PROTON THERAPY SYSTEMS



Verify and map magnetic fields in beam steering and delivery systems for precise close control and patient safety.



Field mapping of beam steering magnet

MAGNETIC SENSOR & SYSTEM TESTING

Evaluate the performance of magnetic sensors, positioning systems and magnetic assemblies in medical instruments.

3-axis field measurement for sensor characterization

SENIS TESLAMETERS – BUILT FOR PRECISION

- Wide dynamic range: from nT to seve
- High accuracy and resolution
- Isotropic 3-axis measurement
- Fast data acquisition & real-time output
- Robust, reliable and easy to integrate

3MH6-E

High-end 3-axis teslameter for research & demanding applications

3MH4

Versatile 3-axis teslameter for lab, production & quality control

3MH1-E

Compact 3-axis teslameter for small magnets & sensors

TRUSTED BY MEDTECH INNOVATORS

SENIS magnetometers are used worldwide by leading medical device manufacturers, research institutes and hospitals to ensure performance, safety and compliance of magnetic technologies.

SENIS
magnetic & current measurement

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Precision magnetic measurement for a healthier tomorrow.

SENIS MAGNETOMETERS & FIELD MAPPERS – PRECISION MAGNETIC MEASUREMENT

ENABLING QUALITY, PERFORMANCE & INNOVATION IN SEMICONDUCTOR MANUFACTURING

Testing, calibrating and characterizing magnetic sensors, systems and processes across the semiconductor value chain.

WAFER-LEVEL MAGNETIC SENSOR TESTING & CALIBRATION

Measure, test and calibrate magnetic sensors and ICs on wafer for offset, sensitivity, linearity, noise and cross-axis behavior.

- Hall, AMR, GMR, TMR, CMOS magnetic sensors
- Wafer-level parametric test & calibration
- High accuracy, high throughput solutions

MAGNETIC SYSTEMS FOR SEMICONDUCTOR EQUIPMENT

Characterize and verify magnetic systems used in sputtering, deposition, ion implantation, etching and inspection equipment.

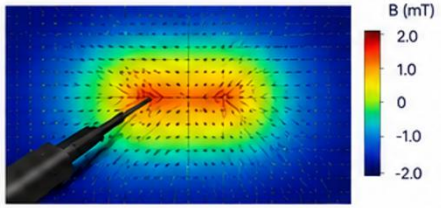
- Magnet field mapping & uniformity
- Magnet design validation
- Process optimization & troubleshooting

INTEGRATION IN SEMICONDUCTOR TEST EQUIPMENT

Seamless integration of SENIS magnetometers and transducers into ATE and process control systems for in-line measurement.

- Compact, robust & system-ready
- Fast data acquisition & real-time output
- Supports automation & high-volume test

R&D, FAILURE ANALYSIS & PROCESS DEVELOPMENT



Advanced magnetic field mapping and analysis for R&D, failure analysis and next-generation device development.

- 2D/3D magnetic field mapping
- Root cause analysis of magnetic anomalies
- Support for new materials & device innovation

SENIS INSTRUMENTS FOR SEMICONDUCTOR APPLICATIONS

F3B Field Transducer

Ultra-high bandwidth for dynamic & pulsed field measurements (up to MHz range)

I3D Isotropic 3-Axis Transducer

True 3D magnetic field measurement for complex field analysis & mapping

3MH4 Teslameter

Versatile 3-axis teslameter for R&D, production & quality control

3MH1-E Teslameter

Compact 3-axis teslameter for small magnets & magnetic components

MAGNETIC FIELD MAPPERS

3D Automated Field Mapper

High-resolution 3D mapping of magnetic fields for systems, tools & components

KEY BENEFITS

- High accuracy & traceability
- Fast & reliable measurements
- Compact & easy integration
- Support for R&D to production
- Improved yield & process control

TYPICAL SEMICONDUCTOR APPLICATIONS

Wafer-level sensor testing & calibration

Sputtering & thin film equipment validation

Ion implantation system verification

Etch & deposition process control

ATE integration & in-line testing

Failure analysis & R&D characterization

TRUSTED BY SEMICONDUCTOR LEADERS

SENIS magnetometers and field mappers are used worldwide by semiconductor manufacturers, equipment suppliers, OSATs and R&D labs to ensure performance, reliability and innovation.

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Precision. Performance. Innovation.

PRECISE MAGNETIC MEASUREMENT FOR CONSUMER ELECTRONICS

SENIS magnetic solutions

SENIS magnetometers ensure the safety, EMC compliance and performance of magnets and magnetic components in today's smart, connected devices.

ENSURE EMC COMPLIANCE
Verify magnetic emissions to meet international EMC standards.

ENSURE SAFETY
Prevent interference with sensitive components and protect end-users.

OPTIMIZE PERFORMANCE
Measure and control magnetic properties for peak device performance.

IMPROVE YIELD
In-line monitoring reduces defects and ensures consistent quality.

SENIS MAGNETOMETERS FOR PRODUCTION TEST & MONITORING

PRODUCTION TEST & MONITORING WORKFLOW

COMPONENT PRODUCTION → MAGNETIC MEASUREMENT → EMC & SAFETY VERIFICATION → PERFORMANCE VALIDATION → QUALITY ASSURANCE & TRACEABILITY

APPLICATIONS IN CONSUMER ELECTRONICS

SMART PHONES
Test and monitor magnets in speakers, haptics, cameras, wireless charging and MagSafe alignment.

SMART WATCHES & WEARABLES
Ensure reliable operation of haptic motors, heart rate sensors, compasses and charging systems.

WEARABLE AUDIO DEVICES
Measure magnets in micro speakers, drivers and ANC systems for optimal sound and noise cancellation.

ELECTRONIC PCBS
Verify inductors, transformers, relays, connectors and other magnetic components on PCBs.

WIRELESS CHARGING MODULES
Characterize magnetic materials and alignment for maximum charging efficiency.

HAPTIC MOTORS & ACTUATORS
Test magnetic flux density and uniformity for consistent haptic feedback and user experience.

KEY BENEFITS FOR MANUFACTURERS

EMC COMPLIANCE & SAFETY | HIGH ACCURACY & RELIABILITY | HIGHER YIELD & LOWER COSTS | FASTER TIME TO MARKET | EASY INTEGRATION INTO PRODUCTION

SENIS magnetic solutions

TRUSTED BY LEADING COMPANIES WORLDWIDE

Engineering precision. Ensuring safety. Optimizing performance.

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SENIS AG, Switzerland

SWISS ENGINEERING & MANUFACTURING

PRECISION MAGNETIC MEASUREMENT FOR MEDICAL INNOVATION

SENIS Magnetometers – trusted by MedTech leaders for accurate measurement, testing and characterization of magnets, sensors and magnetic systems.

SENIS magnetic solutions

SWISS PRECISION
ENGINEERED IN SWITZERLAND

Reliable measurements from microtesla to several tesla

High accuracy | High resolution
Isotropic 3D measurement
Swiss quality | Long-term stability

SENIS TESLAMETERS – ENGINEERED FOR MEDTECH

APPLICATIONS IN MEDTECH

MRI SYSTEMS
Measurement and mapping of static and gradient magnetic fields for image quality and system performance.

SUPERCONDUCTING MAGNETS
Test and characterization of superconducting magnets for NMR, particle therapy and research applications.

WEARABLE DEVICES
Measurement of miniature magnets and magnetic sensors used in health tracking, motion analysis and diagnostics.

HEART PUMPS
Testing of magnetically levitated rotors and motors for reliable and efficient blood circulation support.

PROTON THERAPY
Verification and mapping of magnetic fields in proton therapy systems for precise dose delivery.

MAGNETIC SENSORS & SYSTEMS
Characterization of sensors and magnetic assemblies used in diagnostic, monitoring and therapeutic devices.

WHY MEDTECH COMPANIES CHOOSE SENIS

HIGH ACCURACY | WIDE DYNAMIC RANGE | 3D ISOTROPIC MEASUREMENT | RELIABLE & REPEATABLE | BUILT FOR RESEARCH & QA

TRUSTED. PRECISE. ESSENTIAL.
Empowering innovation in medical technology with precise magnetic measurement.

SUPPORTING LIFE-CHANGING TECHNOLOGIES
From diagnostics to therapy, SENIS magnetometers help ensure safety, performance and reliability.

www.senis.swiss
SENIS AG, Switzerland

PRECISION MAGNETIC MEASUREMENT FOR THE SEMICONDUCTOR INDUSTRY

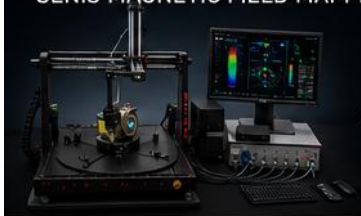
SENIS magnetic solutions

SENIS magnetometers and magnetic field mappers deliver the accuracy, reliability and automation required for advanced semiconductor manufacturing, testing and process control.

- **HIGH ACCURACY** — From nT to Tesla
- **WIDE BANDWIDTH** — DC to MHz range
- **ISO 17025 READY** — Traceable & repeatable
- **AUTOMATION READY** — Easy integration into test systems

SENIS MAGNETOMETERS

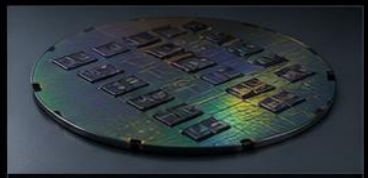
SENIS MAGNETIC FIELD MAPPERS – HIGH RESOLUTION 3D FIEED MAPPING



- 3D VECTOR FIELD MAPPING (Bx, By, Bz)
- SUB-MILLIMETER SPATIAL RESOLUTION
- LARGE MEASUREMENT VOLUME
- AUTOMATED MEASUREMENTS
- IDEAL FOR COMPLEX MAGNETIC SYSTEMS

Essential for developing and validating magnetic designs used in semiconductor tools, from magnets and sensors to complete subsystems.

APPLICATIONS IN SEMICONDUCTOR MANUFACTURING



WAFER LEVEL SENSOR TEST & CALIBRATION

Test, calibrate and characterize wafers with magnetic sensors (Hall, TMR, AMR, GMR) for position, current and angle sensing applications.

SPUTTERING & THIN FILM SYSTEMS

Measure and map magnetic fields in sputtering equipment for process optimization, uniformity and magnetron characterization.

INTEGRATION IN SEMICONDUCTOR TEST EQUIPMENT

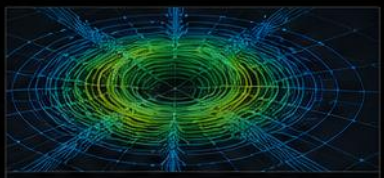
Seamless integration of SENIS magnetometers and transducers into ATE and handler systems for in-line magnetic testing and quality control.

MAGNETIC SYSTEMS & COMPONENTS

Test and characterize magnets, actuators, magnetic chucks, linear motors and other magnetic assemblies used in semiconductor manufacturing equipment.

PROCESS CONTROL & MONITORING

Real-time magnetic field monitoring for predictive maintenance, drift detection and process stability.



R&D, VALIDATION & FAILURE ANALYSIS

Detailed magnetic field mapping and analysis to support R&D, simulation validation and root cause analysis.

KEY BENEFITS

- IMPROVE YIELD & QUALITY
- ENSURE SAFETY & EMC COMPLIANCE
- REDUCE DOWNTIME & COSTS
- ACCELERATE R&D & INNOVATION
- TRACEABLE & RELIABLE

SENIS magnetic solutions ✚

MEASURE. CONTROL. OPTIMIZE.

Enabling precision, performance and reliability in semiconductor manufacturing.

PRECISION MEASUREMENT · SWISS ENGINEERING · SUPPORT

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