SENSOR.KOSMOS.

Issue 33 | April 2025

17. XMR-Symposium

Two inspiring days full of knowledge and exchange

Image source: Adobe Stock

SENSITEC AND THE XMR SYMPOSIUM:
A LOOK INTO THE FUTURE OF MAGNETORESISTIVE SENSORS

Today‘s technology is developing at a speed that sometimes makes it difficult to keep track. Especially in the field of sensor and measurement technology, there are constantly new innovations that are revolutionising our world.

To promote such innovations, Sensitec launched the XMR Symposium many years ago. This specialist congress offers experts and users a platform to present and discuss the latest developments and research results in magnetoresistive technology.

The XMR Symposium: A meeting place of the future

The XMR Symposium is an important event for specialists from the sensor and measurement technology industry, as well as experts from research and development.

The interdisciplinary exchange that takes place during the two-day event is particularly outstanding. Physicists, engineers, developers and scientists have the opportunity to discuss the latest trends and technologies. The presentations on topics such as the further development of magnetoresistive materials, new processes and the integration of these technologies in sensors and applications are particularly exciting.

For Sensitec, the symposium is not only an opportunity to present the latest products and technologies, but also an important framework for exchanging ideas about the possibilities of the technology. Regardless of whether they are competitors, research institutes or potential customers, the symposium promotes discussion and co-operation in order to jointly develop solutions and improvements for the future.

Why the XMR Symposium is crucial for the future of the technology

The XMR Symposium has established itself as an important event in the field of magnetoresistive sensor technologies. In view of the growing importance of precise measurements and sensors in various industries, the symposium will continue to play a role in the future. The ongoing development of new possibilities, where sensor technologies, for example, are having a major impact, will not only change industry but also society as a whole.

Innovations based on magnetoresistive effects have the potential to optimise products and processes in industry - be it in automation, medical technology or robotics. The XMR Symposium provides the ideal framework for further researching these technologies and shaping the next generation of product solutions.

To summarise, it can be said that cooperation between science, research and industry is the key to a successful future in sensor technology. With the XMR Symposium, Sensitec has created an international platform that puts magnetoresistive technologies and their applications centre stage.

The XMR Symposium took place for the 17th time in March 2025. We, Sensitec GmbH, are convinced that it will continue to be an ideal specialist forum for users and experts of this technology in the future and will drive new innovations through the exchange of information.

René Buß - CTO

> „Today‘s technology is tomorrow‘s bread - today‘s science is tomorrow‘s technology.“
>
> Richard von Weizsäcker

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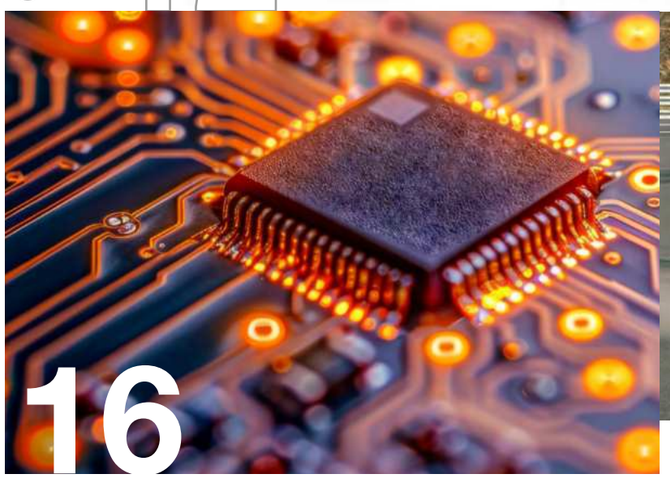

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18 KA-RACEING E.V.

MILESTONES in the symposium series: A look back at over 30 YEARS OF KNOWLEDGE EXCHANGE (1991–2025)

The MR Symposium originated from a project meeting as part of a funding project and has since been used every two years by experts and interested parties to discuss MR sensor technology. The term “MR Symposium” is derived from MagnetoResistive Sensors, whereby Sensitec initially produced AMR sensors. GMR and TMR sensors were added later, which is why the suffix “x” was introduced to include all sensor types. The “MR Symposium” became the “XMR Symposium”.
The MR workshop, which takes place in cooperation with the THM Giessen and teaches both the theoretical and practical basics of magnetoresistive sensors, is particularly popular.

1991
...took place for the first time the symposium, organized by the IMO* and others.

1993
2nd MR Symposium
Date: March 18
Location: Hotel Mercure Wetzlar I Realization in cooperation with INNOMAG.

1995
3rd MR Symposium
Date: April 24 - 25
Location: Hotel Mercure Wetzlar

1997
4th MR Symposium
Date: 11 - 12 March
Location: Hotel Mercure Wetzlar

1999
5th MR Symposium
Date: 09 - 10 March
Location: Hotel Mercure Wetzlar

2001
6th MR Symposium
Date: 09 - 10 March
Location: Hotel Mercure Wetzlar
Last to be held at this hotel and organised by Sensitec GmbH, which was founded in 1999 and evolved from IMO

2003
7th MR Symposium
Date: 09 - 10 March
Location: Conference rooms Wetzlar I Spilburg

2005
8th MR Symposium
Date: 8 - 09 March
Location: Conference rooms Wetzlar I Spilburg

2007
9th MR Symposium
Date: 13 - 14 March Location: Conference rooms Wetzlar I Spilburg

2009
10th MR Symposium
Date: 31 March - 01 April
Location: For the first time in the Stadthalle in Wetzlar

2011
11th MR Symposium
Date: 29 - 30 March
Location: Stadthalle Wetzlar

2013
12th MR Symposium
Date: 19 - 20 March
Location: Stadthalle Wetzlar

2015
13th MR Symposium
Date: 03 - 04 March
Location: Stadthalle Wetzlar

2017
14th MR Symposium
Date: 21 - 22 March
Location: Stadthalle Wetzlar

2019
15th MR Symposium
Date: 19 - 20 March
Location: Stadthalle Wetzlar

2021
No symposium was held due to the coronavirus pandemic

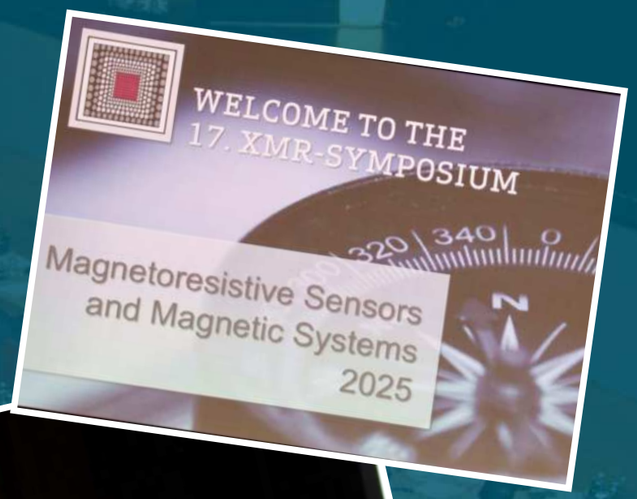
2021
17th MR Symposium
Date: 12 - 13 March
Location: Stadthalle Wetzlar

2023
16th MR Symposium
Date: 08 - 09 March
Location: Stadthalle Wetzlar

* IMO (Institut für Mikrostrukturtechnologie und Optoelektrinik e.V.)

Jasmin Hahn - Marketing

17. XMR-SYMPOSIUM
IMPRESSIONS



DEPARTMENT CHIP DEVELOPMENT

Innovative developments in chip technology: the “Chip Development” department in Mainz

The “Chip Development” department in Mainz is divided into two groups. One group consists of process engineers whose task it is to optimize existing processes, develop new procedures, evaluate innovative tools and accompany investments through to final acceptance. There is a particular focus on magnetic materials - especially magnetoresistive films.

The team is working intensively on AMR, GMR and TMR films, as these different physical effects offer specific advantages for various applications.

In addition to magnetoresistive films, electrodeposited magnetic flux guides are also of central importance. They are crucial for our patented magnetization processes, can serve as magnetic shields or can be integrated as permanent flux guides in the chip design. Another core element of the work is testing the magnetic properties of both the layers and the finished sensors - an essential area of expertise within the team.
The second group focuses on the development of new designs for magnetoresistive sensors. The close cooperation with the process engineers is a decisive advantage here: when new requirements are placed on the TMR layer or a magnetic shield, the experts are on site, which ensures close interdisciplinary teamwork.

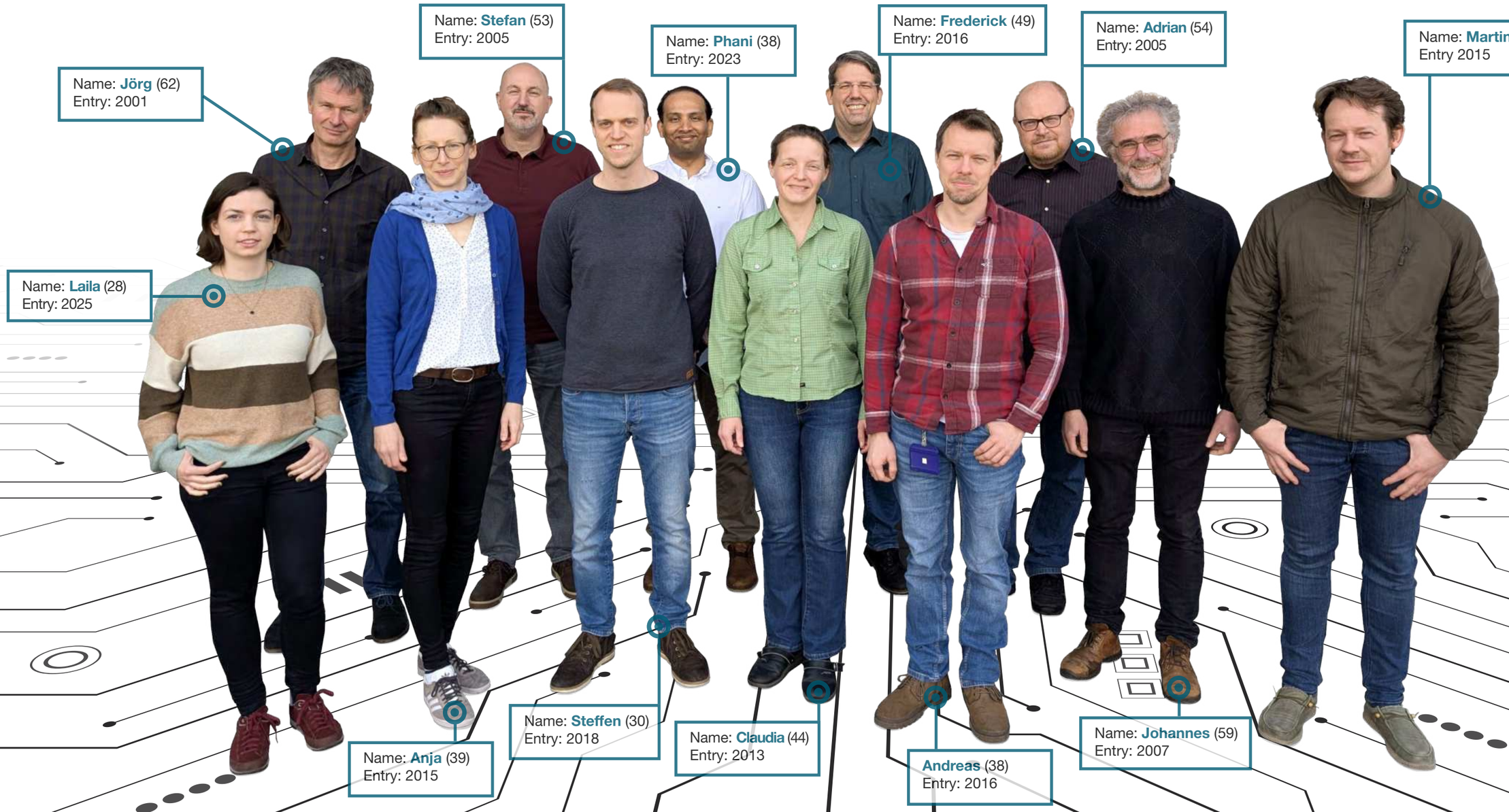
Despite its comparatively small size, Sensitec has developed and successfully launched cutting-edge technologies in both the AMR and TMR sectors. This is achieved on the one hand through joint projects with universities and research institutes and on the other through close cooperation with customers from Europe, the USA and China. The development processes differ significantly depending on the region. Originally, we established detailed, structured development processes that are strongly based on the AIAG APQP regulations and have proven themselves in automotive projects. We have also been successfully audited repeatedly in accordance with the TS16949 standard.

Thanks to our new management, we have focused more on proximity to Chinese customers and, above all, on speed, which is now just as important as quality. In order to increase agility in development, we have developed a “rapid prototyping” process that enables prototypes to be implemented more quickly. This can reduce bureaucratic hurdles in the development process.

Sensitec‘s ability to move quickly from the concept phase to the first prototypes, while larger companies are still busy with planning, gives it a clear competitive advantage. The challenge is to combine the best elements of different development approaches to not only stay at the forefront of technology, but also to set the standard through an agile and efficient development process.

We are proud to have developed a wide range of magnetoresistive chips for various automotive, industrial and medical applications as well as for high-growth, modern markets such as current sensors and encoder sensors for robots.

Dr. Johannes Paul - Chip-Entwicklung



WEBSITE RELAUNCH: A NEW LOOK FOR WWW.SENSITEC.COM

We are delighted that our new website went live at the beginning of this year. After intensive planning and work, www.sensitec.com now presents itself in a modern design and with optimised functions. The aim of the relaunch was to offer our customers a more user-friendly, intuitive and visually appealing platform that makes it even easier to access important information.

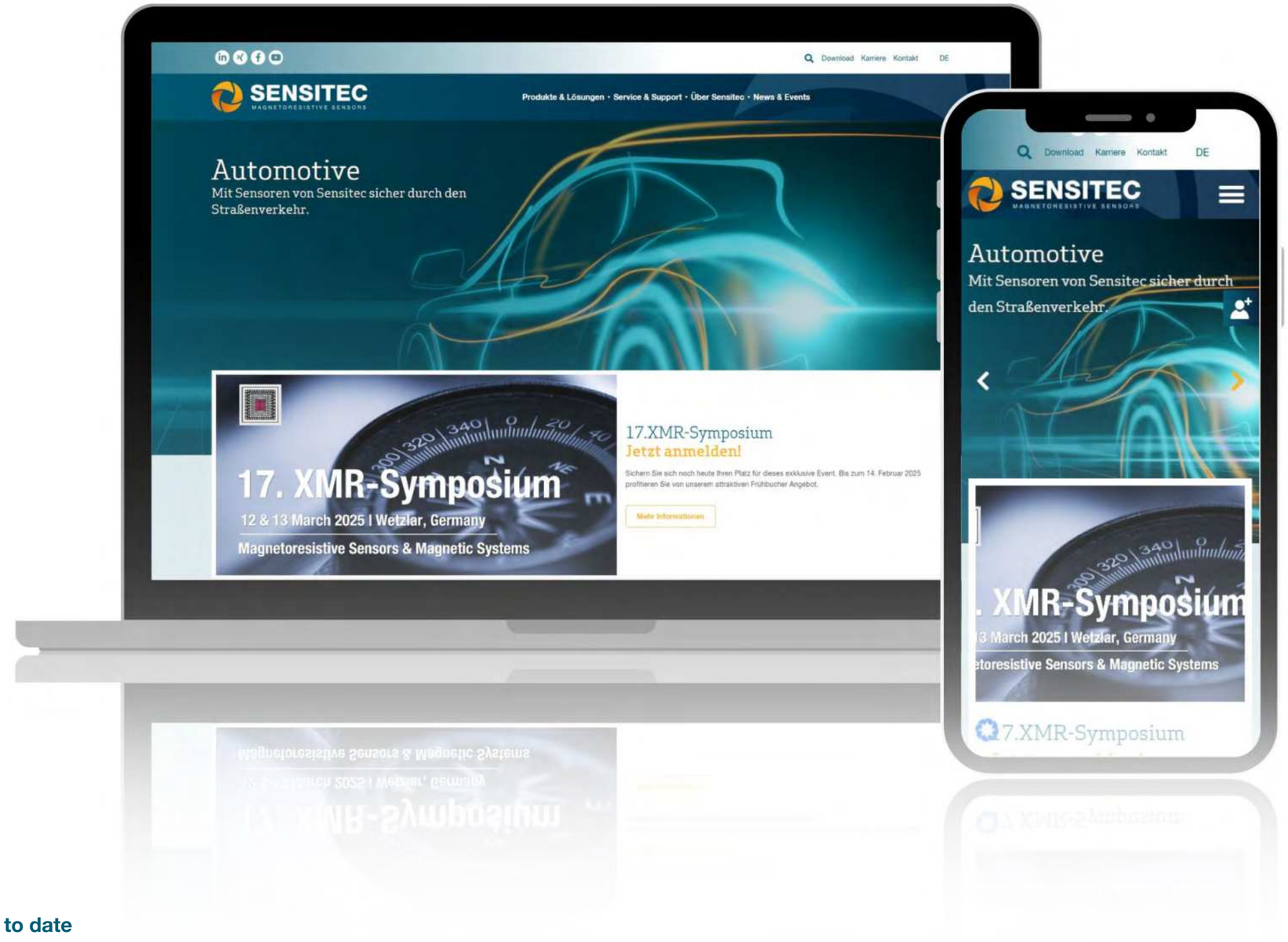
What‘s new?

Our new design is based on a clear structure that makes navigation easier and offers an even faster user experience. Whether product information, application examples or technical details - everything is now clearer and easier to access.

In addition, we have optimised the website for mobile devices so that all content can be easily accessed on the move.

Another highlight of the new website is the postcode-based contact search. This function allows you to quickly and easily find the contact person responsible for your region. Simply enter your postcode and the website will immediately show you the right contact person who can help you with your enquiry.

This interactive function ensures that you are put directly in touch with the right contact to receive support quickly and efficiently. Whether you have a technical enquiry or want to find out more about our products, your personal contact is just a click away.



More than just a new design

In addition to the improved user interface, we have also worked on the structure of the content. Our aim was not only to offer you a modern look, but also to ensure that all information about our products and solutions is presented clearly and comprehensibly at all times.

Always up to date

With the new website, we are focussing on continuous updates and improvements. You can therefore look forward to always finding the latest information and developments relating to our products and solutions.

We invite you to visit the new website and give us your feedback. Your input is important to us in order to further optimise the user experience. Visit us now at www.sensitec.com and discover the new digital home of Sensitec!

Claudia Ulbricht - Marketing/PR

www.sensite.com

Sensitec at German trade fairs:

A look back and outlook for 2025

2024 was a successful year for Sensitec at the most important trade fairs in Germany. As a leading company in the field of magnetoresistive sensors, we presented our innovative solutions to a broad specialist audience and made valuable contacts. Our appearances at the W3+ Fair, electronica, PCIM, Sensor+Test and SPS deserve special mention.

Our product presentations met with great interest, and the discussions with partners and customers provided valuable impetus for the further development of our technologies as well as important insights into the needs and challenges of our target markets, which help us to customise our solutions in a targeted manner.

Outlook for 2025: Our trade fairs this year

Exciting trade fairs are once again on our agenda in 2025. We look forward to being present at major German trade fairs and presenting our latest products and solutions to you. Particularly in the field of renewable energies and collaborative robotics, the further development of sensor technology is becoming increasingly important for increasing the efficiency of companies.

We are excited about the new opportunities that trade fairs 2025 will offer us and look forward to meeting you there and shaping the future of sensor technology with you.

Claudia Ulbricht - Marketing/PR

OUR TRADE FAIR APPEARANCES AT A GLANCE:

PCIM 2025 - Nuremberg, Germany
Date: 6 - 8 May 2025
PCIM | Hall 7 | 515
PCIM is the international trade fair and conference for power electronics, intelligent drive technology, renewable energies and energy management.

Sensor + Test 2025 - Nuremberg, Germany
Date: 6 - 8 May 2025
Sensor + Test | Hall 1 | 534
The SENSOR + TEST is the world‘s leading forum for sensor, measuring and testing technology.

All about Automation 2025 - Wetzlar, Germany
Date: 10 - 11 September 2025
AAA | Hall E0 | 141
This trade fair offers everything to do with industrial automation, industrial robotics and digitalisation, especially for specialist companies.

SPS 2025 - Nuremberg, Germany
Date: 25 - 27 November 2025
SPS | Hall 4A | 647
SPS is one of the most important trade fairs for electrical automation, systems and components.

Our highlights at the trade fairs:

Visit us and discover our latest products and solutions, including
» Sensor chips: Find out more about our high-precision sensor chips, which are convincing in various applications
» Encoder & Magnetics: Get to know our innovative encoder systems and magnetic components.
Current sensors: Find out about our broad portfolio of current sensors for different areas of application.

Why a visit is worthwhile:
» Direct exchange: Take the opportunity to discuss current trends and technologies with our experts.
» Product presentations: Experience our products in action and let us convince you of their quality and performance.
» Networking: Make valuable contacts and expand your professional network.

Please do not hesitate to contact us for further information or to arrange an appointment.
+49 (0)6441 5291 0 / sensitec@sensitec.com / www.sensitec.com

PRECISION INTERPOLATION FOR MAGN ETORESISTIVE SENSORS: THE IBI8001

High-resolution position and angle measurement is becoming increasingly important in numerous applications, particularly in industrial automation, robotics and medical technology, where precise sensors are required to accurately detect and control movements. Magnetoresistive sensors offer decisive advantages here, as they are contactless and wear-free.

An essential component of this sensor technology is the interpolation unit, which generates high-resolution position information from the raw signals of the sensor. The IBI8001 is such a specialised interpolation module, which has been optimised for magnetoresistive sensors in particular. With its high resolution, automatic calibration (auto-calibration) and ELink technology, it enables extremely compact, high-precision encoder solutions. In this technical article, we look at the special features of the IBI8001 and its advantages for applications with magnetoresistive sensors.

Technische Merkmale und Funktionen

The IBI8001 is characterised by a number of innovative functions that set it apart from other interpolation modules:

» **High resolution:** Programmable resolution up to 12 bits (edges per pitch)

» **Automatic calibration (auto-calibration):** Increases accuracy over the entire service life and in the event of temperature fluctuations

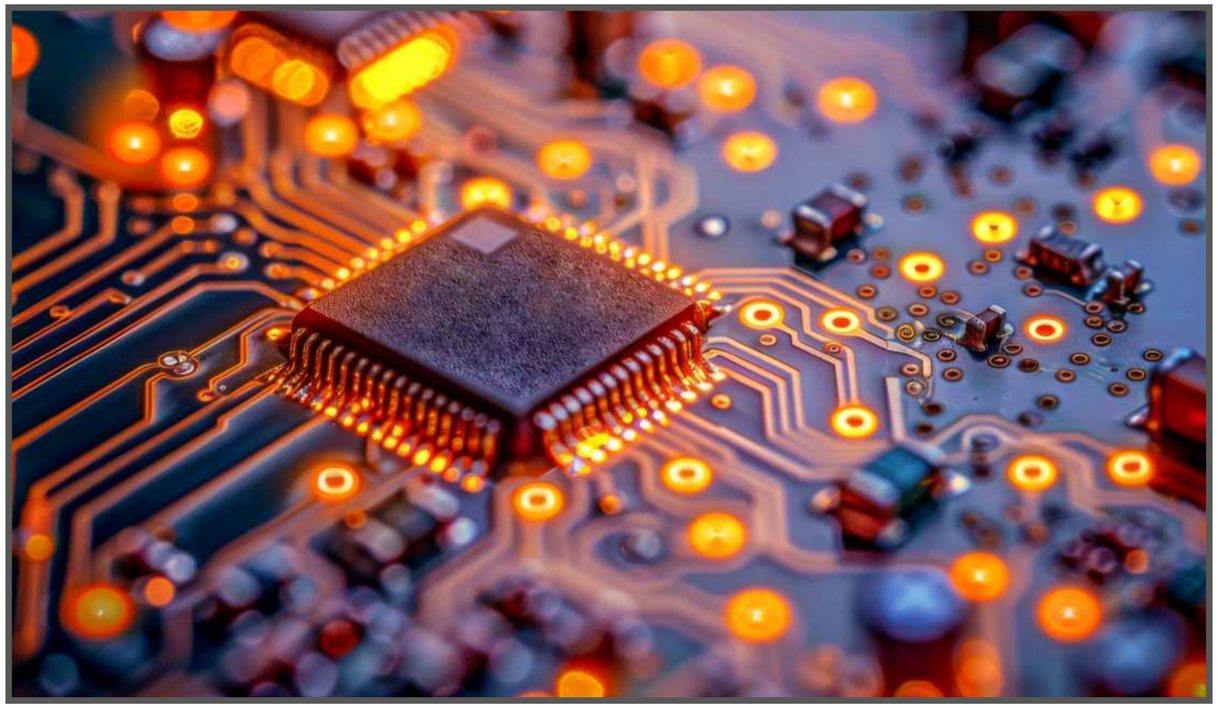
» **ELink technology:** Enables programming via the output lines so that no separate programming pins are required

Differential AB(Z) output: Provides a robust and noise-insensitive signal

» **Flexible supply voltage:** operation with 3.3 V to 5 V

» **Wide temperature range:** Suitable for industrial applications from -40°C to +125°C

» **Various designs:** Available as bare die or in QFN housing



Advantages of auto-calibration

An outstanding feature of the IBI8001 is the auto-calibration function, which significantly improves long-term accuracy. Signal parameters can change due to changing environmental conditions such as temperature drift or mechanical stress over the service life. The auto-calibration continuously compensates for such effects and ensures consistently high measurement precision. This makes the IBI8001 ideal for demanding industrial applications.

ELink technology: Compact encoders without separate programming cables

The innovative ELink technology makes it possible to program the interpolation module via the existing output lines. This eliminates the need for separate programming pins or special wiring, which makes integration into compact encoders much easier. This technology reduces space requirements and simplifies the system architecture, especially in miniature and high-performance applications.

Conclusion

The IBI8001 is a powerful and versatile solution for high-resolution interpolation of magnetoresistive sensors. Its high accuracy, auto-calibration for long-term stability and ELink technology for easy programming make it particularly attractive for demanding applications in industrial automation, robotics and medical technology.

The programmable resolution of up to 12 bits allows developers to adapt the performance precisely to the respective application. The differential signal output also ensures high resistance to electromagnetic interference, which makes it easier to use in harsh industrial environments.

Another key feature is the wide operating temperature range of -40°C to +125°C, which means that the IBI8001 works stably even under extreme conditions. The flexible supply voltage between 3.3 V and 5 V makes it compatible with a wide range of control units.

In summary, the IBI8001 offers a combination of high resolution, long-term stability through auto alignment and easy integration through ELink technology. These features make it the ideal choice for compact, high-precision encoders based on magnetoresistive sensors. In a world where precision and reliability are crucial, this interpolation module sets new standards.

René Buß - CTO

SENSITEC SUPPORTS TEAM KA-RACEING E.V.!

We are pleased to once again support the Formula Student Team KA-RaceIng of the Karlsruhe Institute of Technology with our high-precision TA903 position sensor!

The TA903 uses the Tunnel Magneto-Resistive (TMR) effect to enable precise position measurements. It contains two Wheatstone bridges that are at a 90° angle to each other, enabling highly accurate determination of the angle ⍰ between the sensor and the magnetic field. The result?

Two sinusoidal output signals with a periodicity of one revolution per revolution - perfect for applications at the end of the shaft.

Our sensor can be used flexibly:

- As a bare die for chip-on-board processing
- In SMD processing as LGA6B or DFN8 housing

KA-RaceIng builds a fully autonomous and electric race car every season, which successfully competed against teams from all over the world last season. The non-profit, student-run organization operates without a financial profit motive and instead focuses on scientific education, research and building valuable contacts with industry partners. We are proud to support these innovative projects and look forward to continuing our successful collaboration!

Claudia Ulbricht - Marketing/PR

SENSITEC PRODUCTS NOW ALSO AVAILABLE AT DIGIKEY

As one of the best-known distributors with worldwide availability, DigiKey is one of the leading suppliers in the industry.

The simple, uncomplicated access to a large number of electronic components makes Digikey an ideal source for quickly finding and procuring suitable components, especially for developers in the design and prototype phase of projects.

Since the beginning of this year, Sensitec has also been using the Digikey portal to offer standard sensor and encoder components, as well as current sensors. Sample quantities in particular, outside the MOQ, can be easily procured via the Digikey Marketplace. The products can be easily found using the search function or by using Digikey‘s excellently structured parameter search, which specifies the relevant parameters for the search based on product groups.

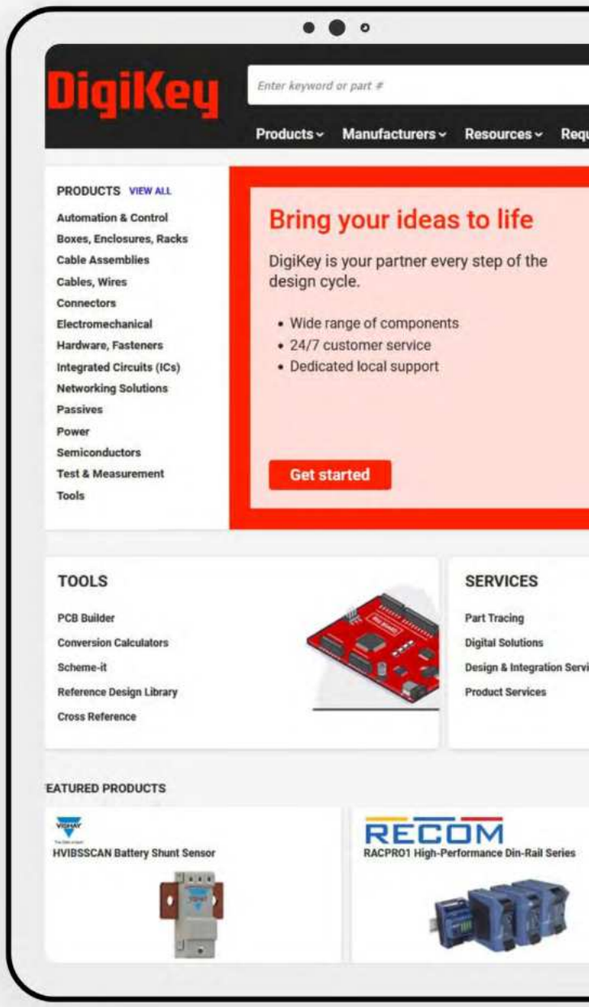
The availability of Sensitec products will be further expanded in the near future so that additional products can be ordered in other countries.

René Buß - CTO

DigiKey

Please visit our store

www.digikey.de/en



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SENSITEC
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