

Sensor. Cosmos.



(Fig. 1: Leica Microsystems / ITK Dr. Kassen GmbH)

Microscopy more important than ever

Bioscientists and pharmaceutical research are working at full speed in the search for vaccines against the corona virus. Microscope and laboratory technology is of particular importance in the fight against the pandemic as it is an indispensable tool for imaging the smallest cell structures. The life sciences, medical and pharmaceutical industries are placing ever increasing demands on the optical resolution of microscopy. ITK Dr. Kassen GmbH in Lahnau has been developing and producing mechatronic systems for the precise positioning of microscope tables for over 35 years - and relies on MR sensors for this.

ITC's know-how in microscope and laboratory technology helps researchers, especially in the current corona crisis. Virologists, bioscientists and pharmaceutical research are working at full speed in the search for vaccines against the corona virus. Now, under time pressure, reliable data must be generated very quickly in order to draw the right conclusions. In the fight against the pandemic, special importance is also attached to the microscope and laboratory technology used. They are indispensable tools for imaging living cells and revealing their physiology.

The biosciences, medical and pharmaceutical industries are placing ever increasing demands on optical resolution in microscopy. ITK Dr. Kassen GmbH in Lahnau-Dorlar has been developing

and producing mechatronic systems for the precise positioning of microscope tables. An infinite number of measurements is needed to kill the virus. This is exactly where the microscope tables of the LMT series can show their

strengths. Mechanics, drive, control, magnetic measuring systems and complete microscope tables are developed and manufactured at ITK. New imaging techniques are helping to ensure that details can be displayed with ever high

her resolution, even below the diffraction limit of light. Fluorescence microscopy enables the identification of different areas or bodies (3D microscopy), even with living objects. However, as soon as the objects to be examined are larger than the field of view, the object must be moved precisely. For larger areas, a highly precise scanning stage is used. The more precisely this can be positioned, the faster and safer the individual images can be lined up in the computer and artefacts can be avoided. Fast positioning is of great advantage if the throughput during digitizing has to be increased. To achieve the required positioning accuracy, magnetoresistive sensors from Sensitec are used. MR sensors have a particularly high accuracy due to their principle. FixPitch sensors type AL803 from

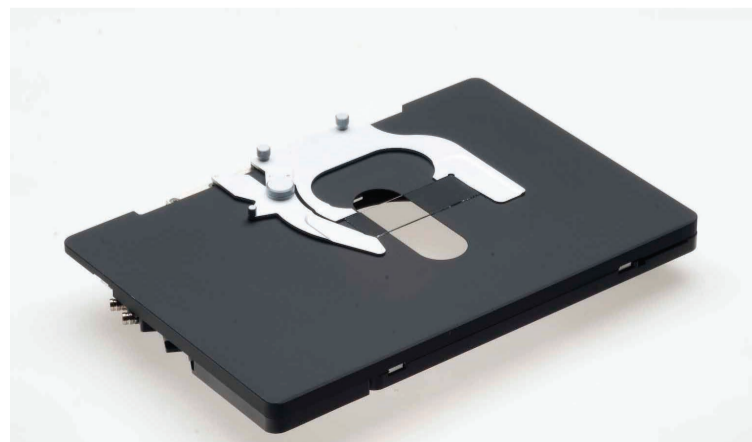


Fig. 2: The microscope from Leica Microsystems shown in Fig. 1 uses the microscope table of the LMT series from ITK. The instrument from Central Hesse is currently also being used by Prof. Christian Drosten, Director of the Institute of Virology at the Charité in Berlin (ITK Dr. Kassen GmbH).

The Lahnau-based company ITK Dr. Kassen GmbH has been developing positioning systems and controls in the field of fine positioning down to the nanometer range for over 35 years. What was once a service provider for developments in the field of hardware and software has today become a company focusing on the development and production of mechatronic systems with the highest precision. Tailor-made positioning systems and their components are developed and manufactured from one source at ITK.

www.itknet.de



Sensitec are used for the length measurement systems in the individual linear axes.

Unlike the usual strong-field sensors, these pole-adapted weak-field sensors are not operated in the saturation range of the AMR strips, where the entire AMR strip is rotated with respect to its direction in the magnetic field. Instead, in weak-field operation, the AMR strips are preferentially oriented by an external supporting field, and the magnetic field of the scale

twists this magnetization depending on its polarity. Special hard magnetically coated metal scale tapes are used here as measuring scales.

In this constellation, the sensor supplies one signal period of sine or cosine signal per pole pair. Sophisticated signal processing enables position resolutions in the single-digit nanometer range and repeatabilities of +/- 100 nm. If living objects are examined, the examination time is often short and fast positioning is therefore very helpful. Many experiments require a defined ambient climate and therefore take place in an incubator.

The great advantage of the scanning stage: it allows the sample to be moved without opening the incubator. This could change the desired climate and influence the sample. With an electronic hand-wheel outside the incubator, the sample can be moved with the coaxial drive and optimally arranged in the beam path.

The technology from ITK offers both the highest precision in microscopy and very fast positioning of the mechanics to ensure optimum results and to detect the smallest cell structures extremely quickly.

It is to be hoped that the corona researchers will make rapid progress in the development of the urgently required vaccine and that the situation will have eased by the time this issue goes to press.

Technical Data

ITK describes the special features and advantages of microscope stages as follows:

- Direct positioning in two axes by means of two linear engines
- Absolute measurement of the position through integrated measuring system, referencing is no longer necessary, simply switch on and position
- Hydra Controller with Ethernet, RS232 and USB communication integrated in the table
- Position resolution ≤ 5 nm
- Absolute accuracy < ±1 µm
- Repeatability < ±0,1 µm
- Joystick and hand wheel optionally
- Smooth manual movement of the table at any time possible
- Very compact design
- Travel range: 120 x 80 mm
- Speed range: max. 500 mm/s
- Max. acceleration 5 m/s²

Company | News

We moved!

New location creates additional capacities

The course for the future has been set: Despite the current crisis, the importance of sensor technology for the future mega trends such as Industry 4.0, Smart Mobility, Smart Health and Smart Energy continue unabated. The move to the new company building enables Sensitec to continue its continuous growth and offers new perspectives.



Since 1.6.2020:
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Figure 1: By moving to the Schanzenfeld industrial park, Sensitec has once again confirmed its commitment to the optics, electronics and mechanics city of Wetzlar after more than 20 years.

The most important information in advance: Thanks to the careful planning in the run-up to the event, a smooth process could be achieved and there was only limited accessibility for a short time.

Since June 1, 2020, Sensitec has been located at a new site. The company has moved to the "Schanzenfeld" industrial estate in Wetzlar.

There Sensitec has a larger and more modern location with a total area of 2970 m² for all departments such as production, development, service and admi-

nistration. The new building offers a directly connected warehouse and production hall with areas of approx. 150 m² for the warehouse and a production area of approximately 510 m². If required, there is always the possibility to even extend these areas.

The 260 m² clean room-manufacturing area with the required demanding clean room environment forms the core of the new 660 m² building complex. The layout of the building, which houses the sales, service, development and general administration departments, is designed to be as open as possible in

order to promote communication between employees.

The improvement of the location is particularly welcomed by the employees, as it benefits all departments through better space conditions and optimised internal logistics.

With the move and the extensive investments, Sensitec is reacting to the positive business development of the past few years and the resulting increasing demands on the technical and spatial equipment of all departments of the company. Special thanks are due

to Körber AG, the owner of Sensitec GmbH, for its far-sighted support in unusual times.

Customers, suppliers and business partners are asked to address their correspondence to the new address in the future and to update the contact data in their systems accordingly.

Perhaps there will soon be an opportunity to welcome you to our new premises.

What we would have liked to show you at the fair

The corona virus also affects the international trade fair calendar. Many exhibitions have been cancelled or postponed. Especially in times when a visit to a trade fair - as we know it - has become impossible, we would like to keep you informed in this way. Here you can read the news about which we would like to talk to you personally.

Product | Magnetic Measurement Scales

Customized, micrometer-precise magnetic scales



As a manufacturer of magnetic sensors and supplier of complete sensor solutions, the know-how of magnetization is one of Sensitec's core competences. Thanks to the latest plant technology with laser interferometers, Sensitec presents itself as a supplier of high-precision magnetic linear scales (length up to 700 mm) and rotational scales (ø up to 300 mm). The scales

are used in displacement measuring systems, encoders, motor feedback systems and handling equipment. Sensitec manufactures the scales in a cost-optimized and tailor-made manner according to customer requirements and offers them in a wide variety of materials and codings (incremental, absolute). A scalable production concept enables Sensitec to supply samples

or small quantities as well as large series. In addition to the high-precision magnetization systems, simulation tools are used to optimally design the magnetization of the measuring elements. Parameters such as magnet material, working distance and adjustment tolerances are evaluated and the measuring standard is optimally designed for the respective application. Of course, the calculations take the chip properties of the MR sensors into account in order to achieve maximum performance for the entire system.

The magnetizing systems have high-precision reference systems that ensure maximum accuracy both during magnetization and during subsequent measurement. The magnetization is performed in a pulse process. Each magnetic pole is implemented into the magnet material with a very high field strength. A magnetization of e.g. polymer-bound NeFeB material is also possible. Pole rings and linear scales can be magnetized with up

to three tracks. Besides pure incremental tracks, reference tracks with one or more poles and of course code tracks with different patterns of north and south poles can be magnetized.

Sensitec provides support in the selection of a suitable measuring standard or sensor. Together with the development engineers, the possible installation situation can also be evaluated and support provided during the design phase. Simple calculation tools are available that help to optimally and quickly design the operating parameters of a sensor on a pole ring. Parameters such as number of poles, pole width, ring diameter and the air gap between sensor and pole ring can be varied to create the best combination.

Sensitec will be pleased to advise you.



CFS1000: Wide bandgap ready. Thanks to its high bandwidth, even very fast switching operations can be measured precisely in order to make optimum use of the advantages of WBG-based solutions.

Product | Current Sensors

Current Sensor CFS1000 - Smaller, faster and more robust

The CFS1000 programmable current sensor was developed for highly dynamic, magnetic measurement of DC, AC and pulsed currents. The concept as a pre-qualified measuring cell enables fast adaptation with low engineering effort to customer-specific applications in modern power electronics. Non-contact and especially broadband current measurements up to 500 kHz in the range from 10 A to 1000 A are possible. The measuring range of the current sensor is determined by the geometry of an external busbar. Due to the differential field measuring principle it also offers a high interference field suppression. The CFS1000 is a compact, low-cost, yet high-quality current sensor with automotive qualification according to AEC-Q100.

Further information to all products: <https://www.sensitec.com>

Product | TMR Sensors

TMR family: The complete sensor portfolio for drive technology ...

The advantages of magnetoresistive sensors are undisputed and MR sensors have long since established themselves on the market as a powerful alternative to Hall sensors. In addition to AMR and GMR sensors, the latest generation of TMR sensors is now increasingly coming to the fore with its specific

advantages. With the TMR effect, Sensitec is expanding the technological possibilities of sensor chips and opening up new applications. Sensitec now offers the complete portfolio of TMR sensors for electrical drive technology: Sensors for position, angle and end position detection.

Advantages such as high energy efficiency, high accuracy, very high temperature stability with low drift

These new TMR chips are now available:

TA903 - for precise angle measurement, absolutely over 360

TL915 - for length measurement, especially for nonius systems

TF952 - highly linear field sensor, ideal for intelligent limit switches

behavior, use in a wide range of magnetic field area, small size so such as high signal quality for demanding positioning tasks make them the ideal choice in many application areas.

Sensitec offers the TMR sensors in different product versions. Samples and evaluation kits are available on request.

Personnel News

Alexander Veidt new CFO Management



Alexander Veidt, CFO at Sensitec

On December 1, 2019, **Dipl.-Kfm. Alexander Veidt** took over the responsibility as commercial director (CFO) at Sensitec. He succeeds Peter Hammer in this position, who has taken on new responsibilities in another Körber business area, but will continue to be appointed as Managing Director for a transitional period. In his new position Alexander Veidt responsible for the areas of finance/controlling and production.

"We are pleased to have a manager with extensive experience not only in the commercial field, but also with distinct knowledge of the industrial environment and automation," emphasizes Dr. Rolf Slatter (CEO). Alexander Veidt is married and father of three children. His family actively supports him in his passionate hobby - triathlon.

Waldemar Rode Sales Europe



Waldemar Rode, new Sales Engineer for European sales area

Since January 2020, **Waldemar Rode** has been the new sales engineer in the field sales force for the Europe region, taking over from Dr. Marc Kramb. In 2012 he will finish his studies of mechanical engineering at the Technical University of Central Hesse (in Gießen). He then worked as a development and simulation engineer for exhaust gas turbochargers in the automotive sector. In 2017 a change followed and he supported a well-known au-

tomotive manufacturer as technical project and account manager in the development of exhaust catalytic converters. Waldemar Rode is looking forward to the upcoming challenges and interesting customer contacts.

He spends his private life together with his wife and dog "Spike" in Linden near Gießen. He likes to dedicate his free time to cycling, bouldering or a good book.

Preview | XMR Symposium 2021

There is life after Corona!

16th XMR-SYMPIOSIUM
MAGNETORESISTIVE SENSORS & MAGNETIC SYSTEMS

CALL FOR PRESENTATIONS

09.03. - 10.03. 2021
STADTHALLE WETZLAR

BECOME A SPEAKER AT THE 16. XMR-SYMPIOSIUM IN 2021

For the 16th time Sensitec will act as organizer of the international XMR Symposium in Wetzlar in spring 2021. Be an active part of the event as a speaker. Are you a future-oriented expert in the field of magnetoresistive (XMR) sensor technology or magnetic systems? Are you working on innovative solutions for important questions in magnetic sensor technology and would like to present your results to a broad audience?

- Use the contact to other experts and interested parties to Networking.
- Publish your contribution in the proceedings of the symposium.
- Share your practical knowledge with experts from research and industry.
- Generate new impulses for the industry.

Join us at the international XMR Symposium 2021 in Wetzlar and inspire others with your ideas!

Dates:
Submission of the abstract until: 31.07.2020
Notification of the authors about the acceptance of their contribution: 31.08.2020
Delivery of the complete paper until: 15.01.2021



Your contact or if you wish more information:

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The event will be held in English.

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