

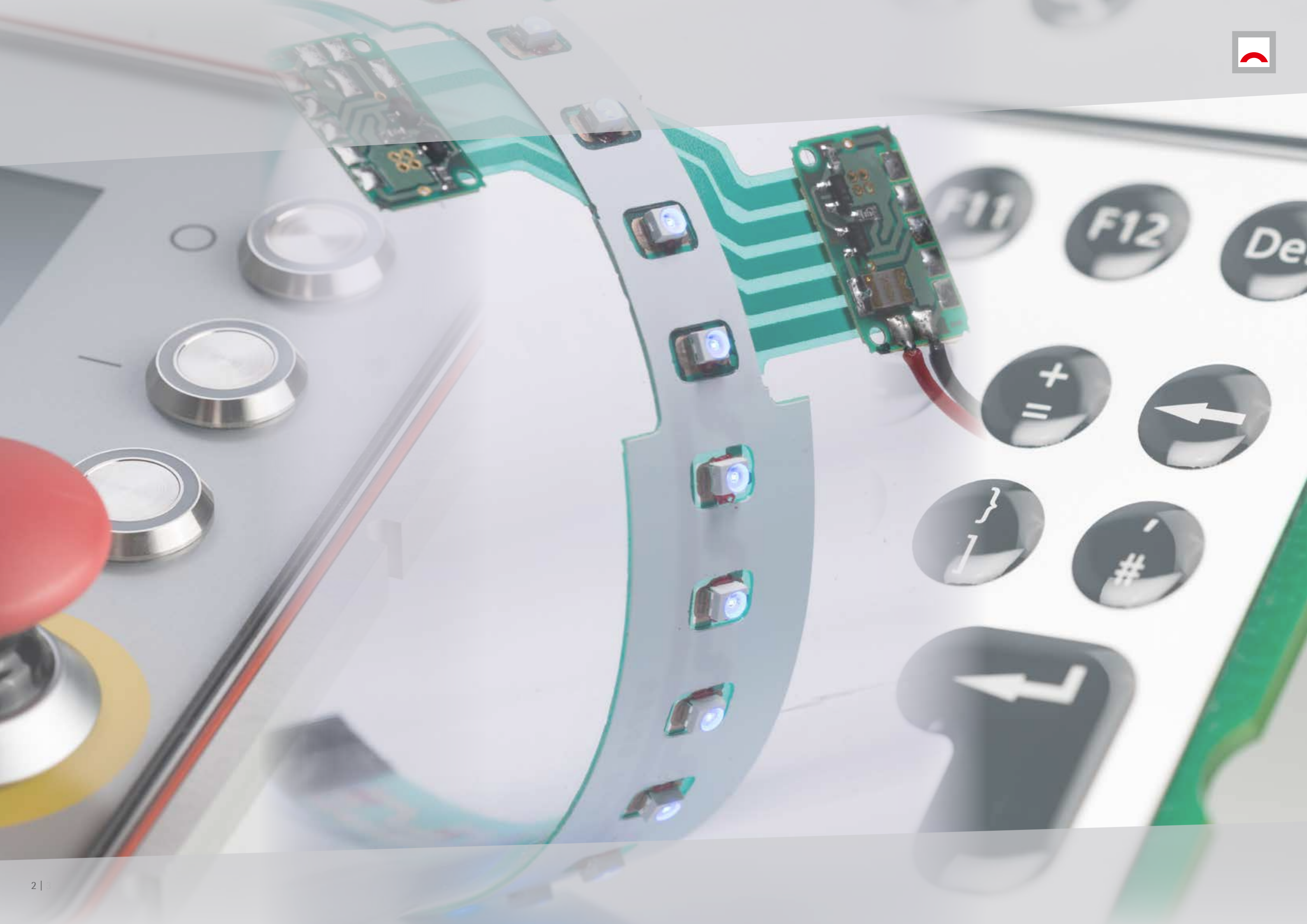


Hoffmann+
Krippner

Touch. Systems. Sensors.

HARMONY BETWEEN MAN AND MACHINE







Welcome

„Touch. Systems. Sensors.“ This is the motto of our product overview 2017.

When Max Hoffmann and Fritz Krippner founded a printing company 45 years ago, they could never have imagined current technological advances, but thanks to early investments in an in-house R&D department, H + K has always been up to date with current technological advances. Although touch technology has fundamentally changed the market for input systems, sophisticated input solutions with membrane keypads are still the perfect fit for many applications. For years, we have been developing input systems customized for you with the highest technological know-how and integrating these systems into your products. You will receive a turn-key solution from a single source: ergonomic design through our GT technology, perfect lighting of keys, the combination with other input and display tech-

nologies and, last but not least, the implementation of particularly high-quality aluminum and steel housing by TES-Frontdesign as well as the proven plastic housing by OKW Gehäusesysteme. We are happy to supplement our solutions with customer-specific electronics that we develop, manufacture and install for your applications. We are convinced: if you are looking for the perfect custom input solution for your machine or device to be implemented in up to several tens of thousands of systems, you are in the right place. Two additional key technologies are complementing our portfolio of sensors and input systems since 2017: The “Printed Electronics” division offers cost-effective solutions to integrate electronic components printed on foil into your product. This provides the opportunity for evaluation of touch inputs in a free molded plastic panel, for example.

As the combination of more and more functionality with printed circuits is an important topic for future technologies, we continue to focus on research, development and production with you at the forefront. „Robiotic“ is the logical progression of our sensor technology: sensor or machine data are stored as Big-Data in the cloud via special mobile radio-based transmission technology. The Robiotic frontend offers you a great toolbox of functionality, making it extremely productive for implementing IoT projects with little customization and implementation effort. We work closely with Deutsche Telekom and Salesforce. We are happy to support your projects with our innovation. Let us build a successful future together!

Your executive board of the H + K Group: Ralf Krippner, Martin Gehrig, Rüdiger Hannaleck



EVOLUTION AND HIGHLIGHTS

From printing on foil to the modern multi-touch system

For more than 45 years, Hoffmann + Krippner has been the first point of contact for interfaces between man and machine. Innovations from H+K still set standards for industrial keyboards and operating elements on technical devices and machines. At home in every industry and the right solution for every application: H + K is the right partner to implement your ideas.

Inventor of the GT technology

Hoffmann + Krippner has set milestones in the development of input systems using metal domes, still a symbol in the company logo today, or the GT technology for exceptional

haptics when operating machines. The complex electronics production in Buchen, Germany and a strong team in development and design offer almost unlimited possibilities for customer wishes and ideas.

Top provider of individual touch systems

Capacitive or resistive touch systems are manufactured in Buchen, Germany and made according to customer specifications. These systems can be refined by „optical bonding“ and supplemented with keys as desired. If requested, SideLED lighting developed by H + K ensures full illumination of every single button.

>> Perfect customer-specific input systems <<



YOUR PARTNER
FROM PROTOTYPE
TO FULL
PRODUCTON



How an idea develops into a product

Thorough consultation to our customers is a major focus at H + K, supported by modern communication tools like WebEx and TeamViewer. Due to the large technical bandwidth, Hoffmann + Krippner can develop and manufacture both appropriate electronics and software as well as optimal mechanics and beautiful design. The integration of resistive and capacitive touchscreen units is just as much a part of our day-to-day business as the intelligence behind the display.

Support for your product development
Technical care and organized project management at H + K take the pressure off your product development. Our

experts in Buchen, Germany identify opportunities and consult with trained experts to conceptualize and develop your projects, keeping in mind the sense of reasonable time-cost relations.

Your manufacturing partner
Our specialists are intimately familiar with the requirements of many different industries. The product application is a key element during a consultation. Hoffmann + Krippner, as your manufacturing partner, will provide you with production documents for a well-engineered, technical product that will surpass the competition. Our thousands of successful projects and four decades of experience speak volumes.

>> Online advice on TeamViewer
minimizes travel expenses <<





Many years of experience in printing technology for innovative products

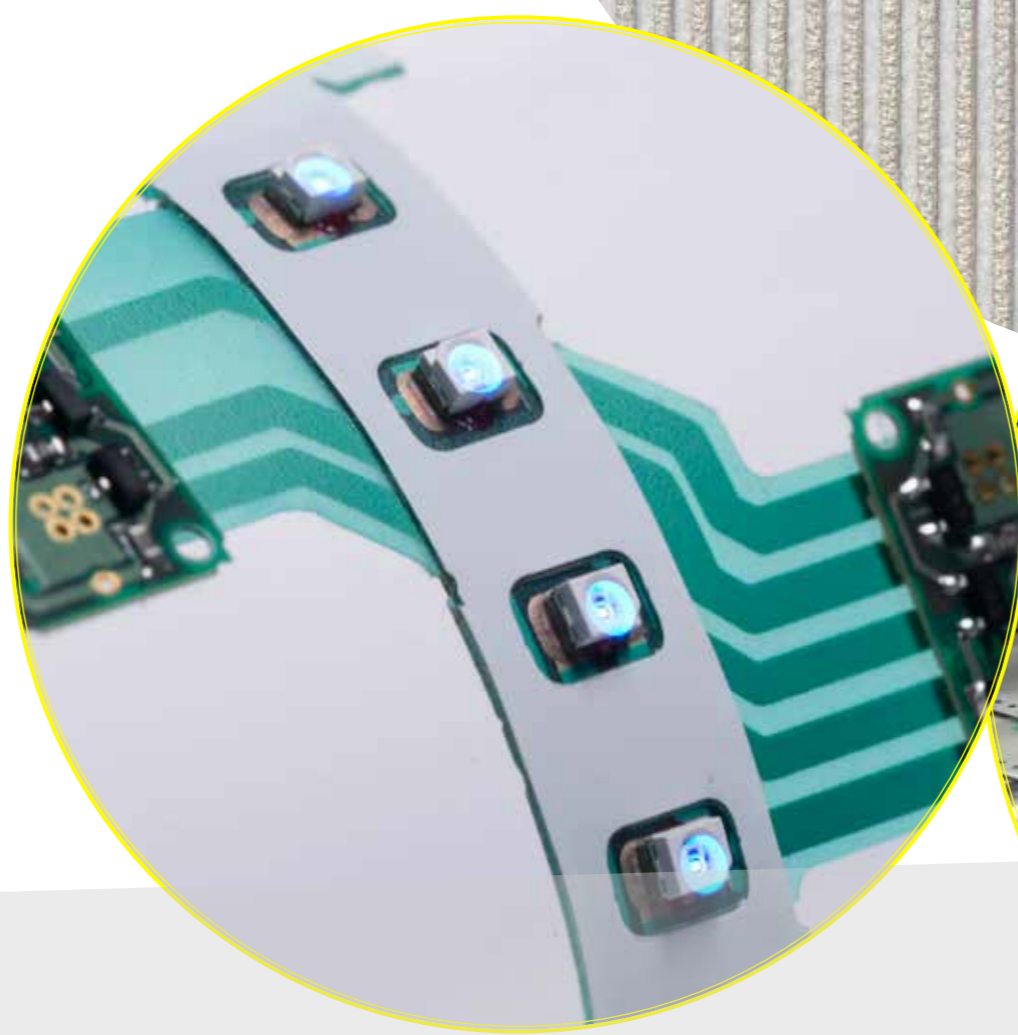
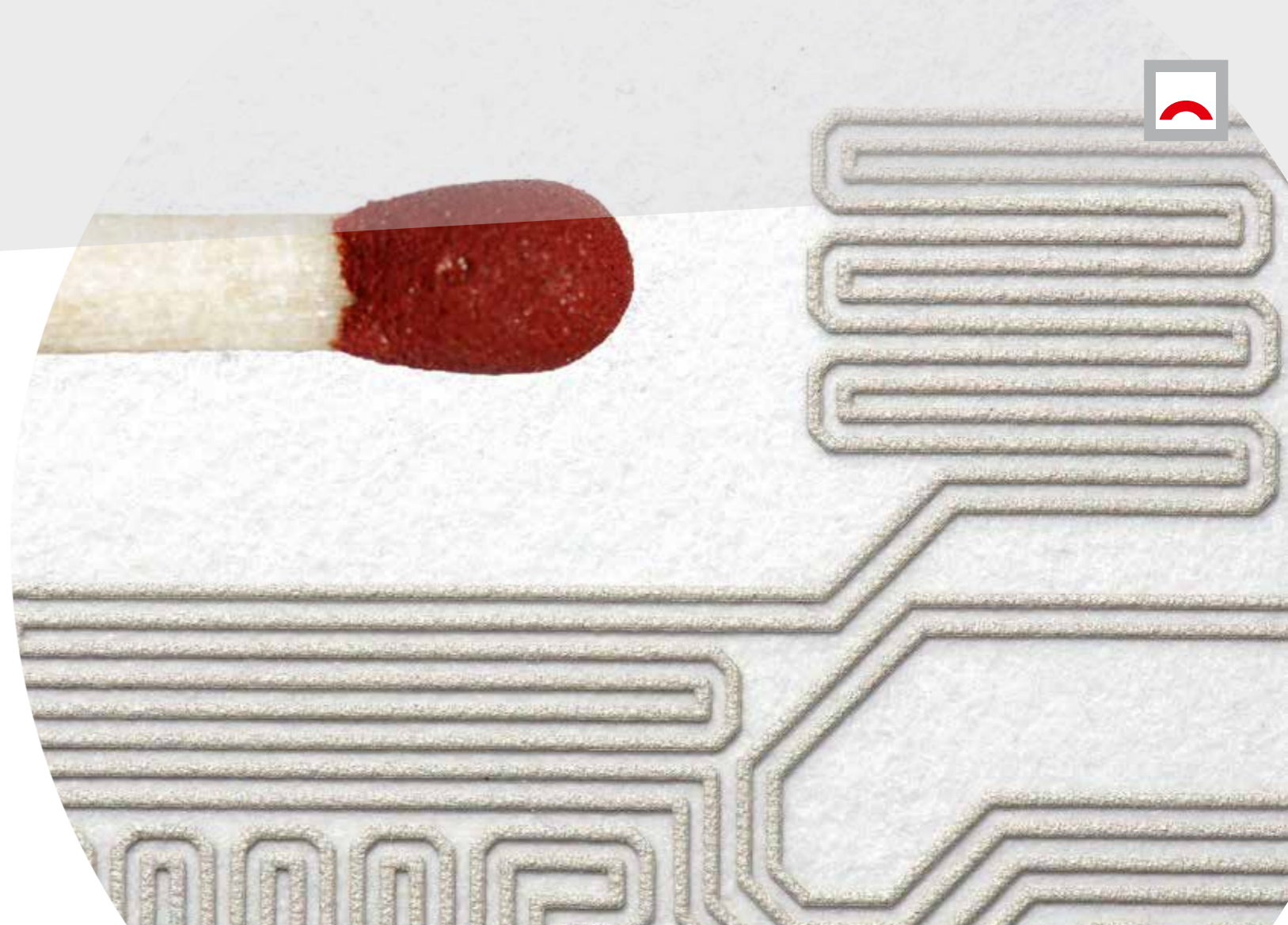
„Printed Electronics“ is a combination of printing technologies with conductive pastes and electronic components. As a printing substrate, H + K generally uses a variety of film materials. Additional feasible options include textile fabrics, coated papers or thin metal sheets with an additional mechanical function. Sub-assemblies made of films or foil packages are flexible and can be made (partially) transparent. They can be glued or otherwise adhered to other components. H + K is a technology pioneer for „Printed Electronics“ – we made our first attempts with printed conducting tracks on foil as early as 1976. At the „electronica“ in 1978, we introduced the first generation of membra-

ne keyboards with conducting tracks using a layered construction. The precision of our modern screen printing systems, our own polymer pastes and the deformation and further processing of the components have steadily and significantly improved.

Combination of components

In addition to printed conducting tracks, shielding, touch surfaces, resistors and sensors, electronic components such as LEDs or microprocessors are incorporated. We mount the components to the circuit boards with soldered or plug connections. In addition, the components can be inserted, glued or integrated using a mold process into plastic control panels.

>> Printed Electronics since 1978 <<





Competitive advantage through experience

H + K has been the development partner of the Kostal Group for automotive cockpit products for many years. In 2016, H+K and the company Leopold Kostal entered a technology partnership. H + K supports KOSTAL in the production of prototypes and functional films for operating concepts developed by KOSTAL that are qualified for the automotive industry of the future. This collaboration is exclusive to the automotive sector. The knowledge gained will be offered to H + K for use in laboratory and medical technology, in industrial machinery and particularly in household technology and consumer electronics.

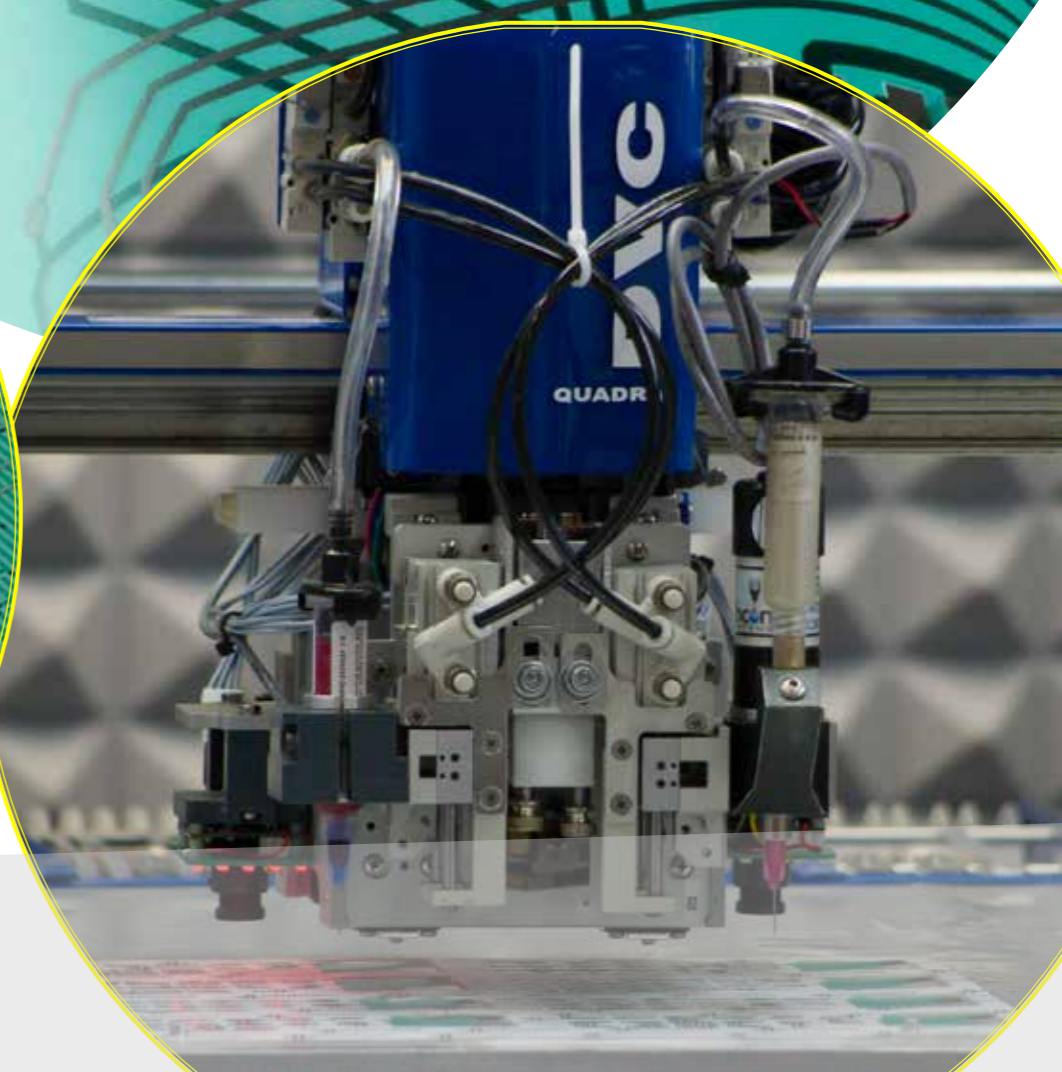
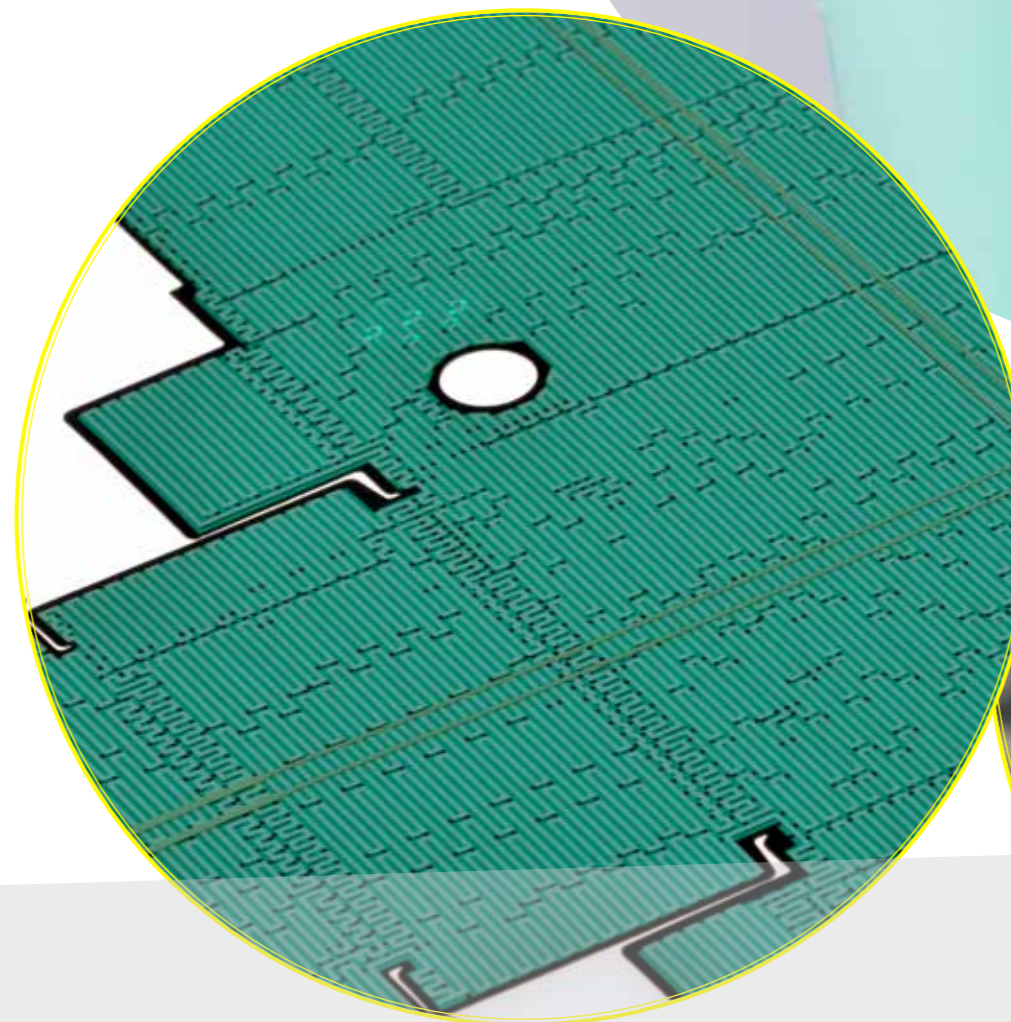
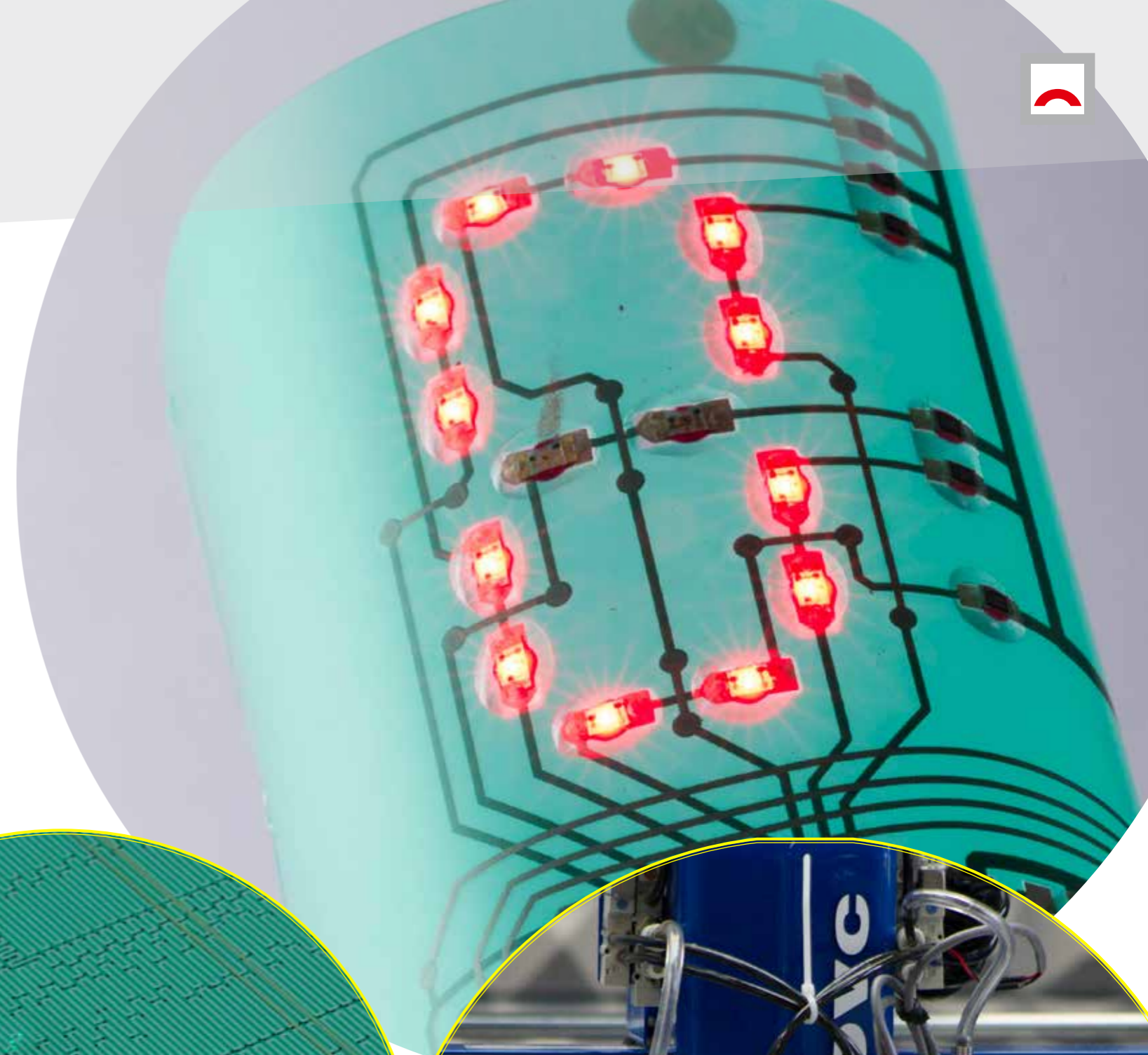
Cost-effective production

The aim of this partnership is to continuously develop modules from the „Printed Electronics“ sector with a focus on precision, field of application and cost-effective production. Additive manufacturing at H + K has resour-

ce-saving effects. Various solutions are already being used today:

- **Security** - Different pastes are printed in the finest structures and combined with a sophisticated layer structure. Mechanical contours are included. This forms the basis for solutions in the field of „security systems“.
- **Hybrid solutions** - A function usually needs a power supply and logic. Today, individual components are needed for this purpose. H + K places appropriate components onto the printed circuit.
- **Sensor technology** - Using in-house pastes, resistors to be evaluated can be integrated into the circuit
- **Reliability** - For years, H + K has been implementing printed circuits and manufacturing stable systems.
- **Flexibility** - Various substrates can be processed using various printing techniques, resulting in components that are easily adaptable to any design.

>> Development partnerships for operating concepts of the future <<



Digitization - complete package for industrial Subject Matter Experts (SMEs)

For more than 20 years, H + K has been a specialist in sensor applications based on the „Sensofoil“ membrane sensors and „Sensolnk“ sensors printed on circuit boards. It was an obvious extension to include the complementary electronics, whether they are integrated on the sensor PCB or connected by bus system. This area has experienced such exponential growth potential that we decided to take the next big step in 2017. With our partner company TK-World AG, with which we are socially connected, we have launched the joint venture „Robiotic“ under the motto:

„Your IoT project live in 10 days“

German SMEs have always been leaders in innovation – this applies to your company as well as to H + K. However, digitalizing the economy is a big challenge. The demands digitization places on companies are so diverse and fluid that a single consulting

firm or development office is unable to answer all the questions. If you want to connect your product, machine or sensor data with the IoT, the „Internet of Things,“ many questions arise.

Issues in digitization

Which transmission technology is the right one? Who is a reliable service provider for transmission technology and security in, for example, mobile communications? How can you integrate and manage required SIM cards? Where does the data go and who maintains the cloud connection? How do I enable employees or customers to access their data (and only their data), preferably via app or mobile device? How does important data end up in the ERP system, and how can business processes be connected? How can I efficiently save money with these IoT-based business processes or make money through a business model?

>> Digitization is a complex topic – Robiotic provides you with the puzzle pieces you need to get the job done quickly and efficiently <<

SMART MACHINES

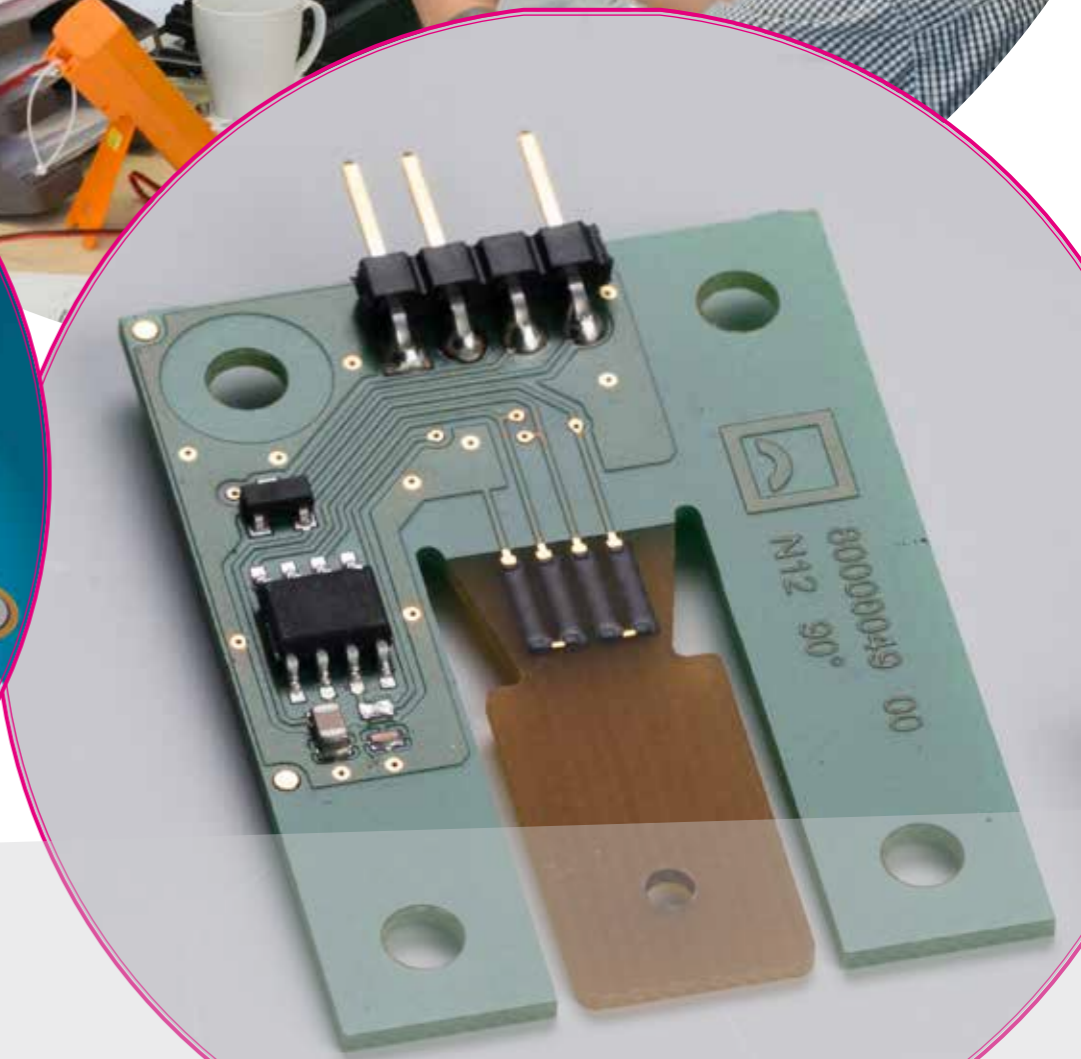
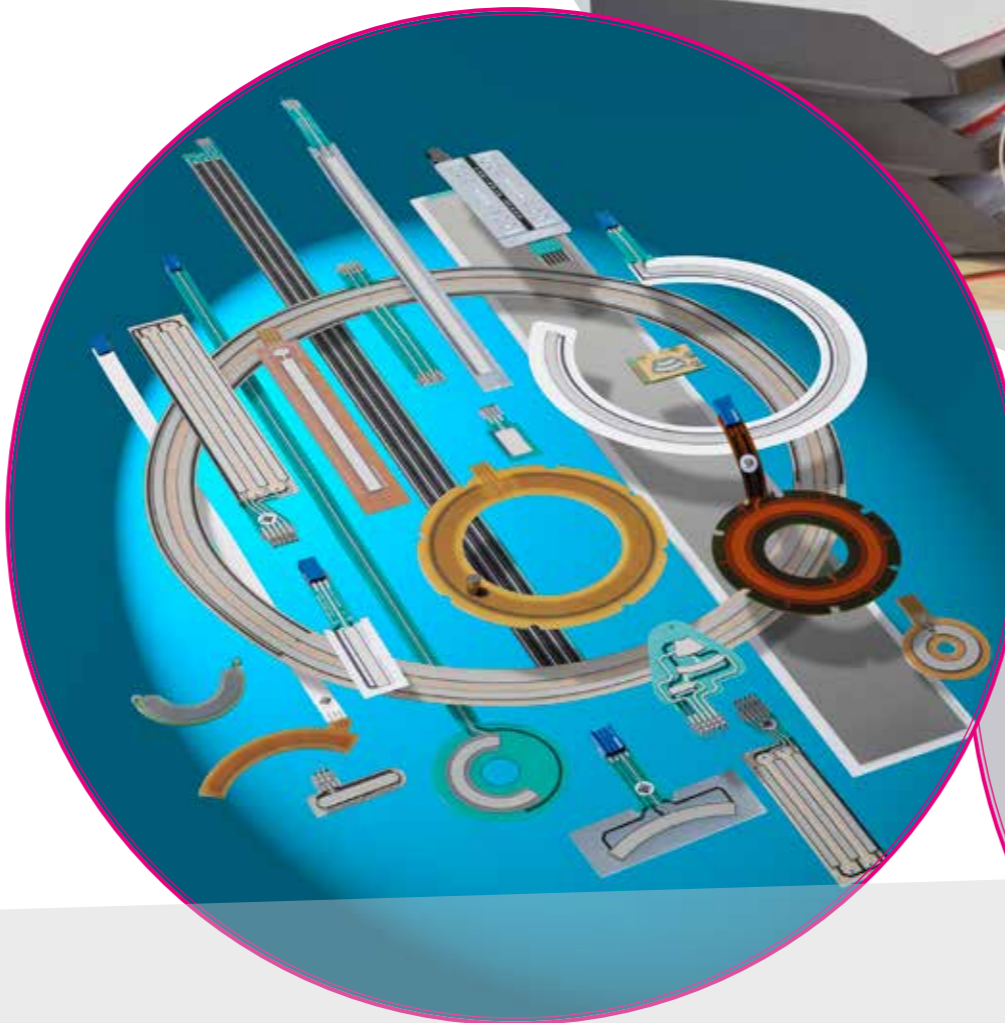


Complete solution from a single source

Robotic already offers "off-the-shelf" scenarios for many applications. Industry-compatible, encrypted and inexpensive transmission technology in hardware, as well as reliable and affordable mobile radio transmission with IoT SIM cards from Deutsche Telekom with worldwide functionality, are integrated and available to you as long as they are needed. The activation and deactivation can be controlled through an internet portal. The Robotic Internet portal provides storage of "Big-Data" raw data in a secure cloud on servers in the T-Systems data center. Ready-to-use processes for summarizing, evaluating and visualizing data with access control, based on hierarchical trees, have been implemented with Salesforce systems that are, of course, customizable and can be connected to your ERP system. Email, SMS or App notifications when thresholds or alarm values are reached can be configured and used with little effort. Built-in billing and payment processes based on Salesforce technology allow you to calculate time or

usage-based billing for your internal cost centers or external partners or customers. All this relies on our many years of Sensorik® know-how. We have successfully implemented hundreds of projects with and for our customers. Most sensor projects are based on pre-engineered standards that are customized with little effort by our design and engineering department. The Sensofoil® product series offers flat, durable and sealed membrane potentiometers, as well as a particularly robust hybrid version, as a magnetic version for non-contact evaluation or in combination with FR4-based components. The Sensolnk® product series is based on its own abrasion-resistant and chemical-resistant printed polymer paste and can be produced film-based or on FR4 material as well as on a steel plate (developed as a prototype). A product range is the Sensolnk® strain gauge, which enables force and bending moment measurement on a FR-4 module. This provides more space for additional evaluation electronics.

>> Sensofoil® and Sensolnk® - customized sensors affordable even at low quantities <<





Modern touch systems with industrial suited design

The touchscreen revolutionizes the market of input systems

A trend follows when customer requirements and significance coincide. But what is the right technology for your very special application? Expert knowledge at Hoffmann + Krippner supports you in all your initiatives, from prototypes to series you can follow all production stages. With us you have found a partner who has accompanied the technology right from start and has played a major role in developing it into an industry standard.

Refinement improves quality

The components are not the only deciding factor in the quality of a touchscreen. They are part of a successful product, but the question, „How do I bring the components together and coordinate them?“ is decisive in production. Software customization, firmware customization, optical bonding and other useful additions matter, and at Hoffmann + Krippner, no opportunities are ignored. This turns your application into a unique, high-quality product.

>> Customer-specific touch input systems: also feasible in small and medium quantities <<



INPUT SYSTEMS



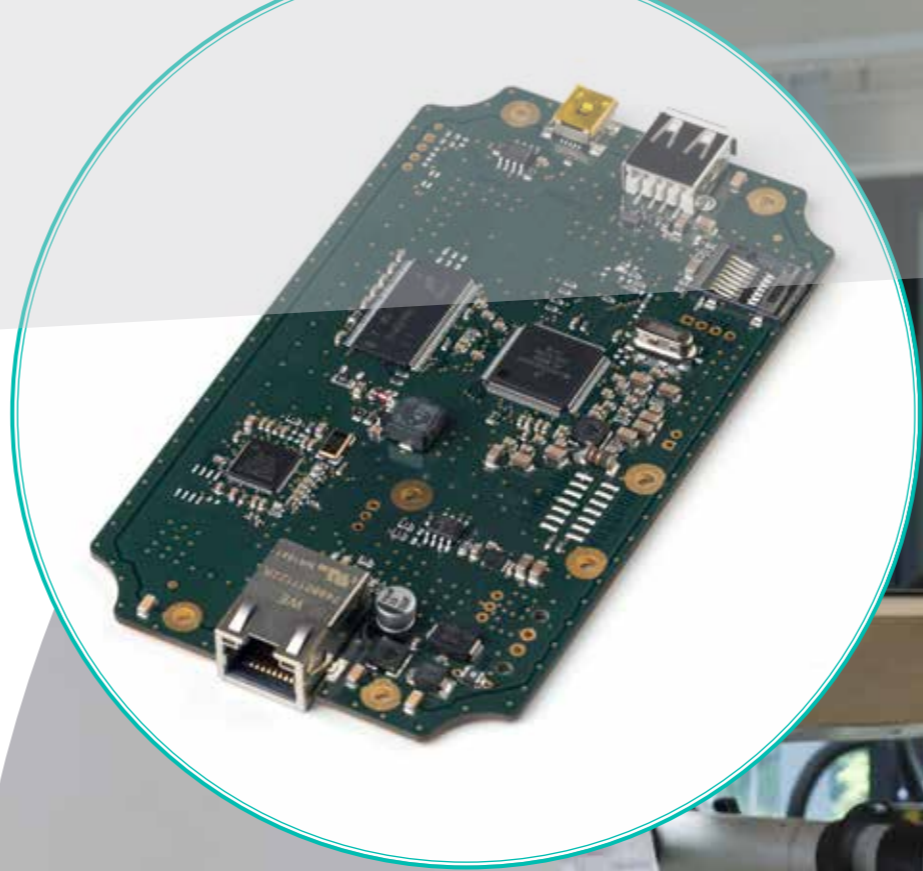
An in-house electronics production with state-of-the-art machines

Vertical integration ensures flexibility – „Made in Germany“ ensures quality

The pride and joy of our company and its clear differentiation from the competition is its complete in-house electronics production with many automated manufacturing processes. Whether a complete assembly of printed circuit boards with electronic components or automatic pop-up assembly and the automated assembly of components on foil, Hoffmann + Krippner uses the latest technology.

Automated processes

The most modern solder paste printers from MyData and selective soldering systems significantly determine the quality of the soldering results and guarantee the longevity of the products made in Buchen, Germany. An automatic inspection of the SMD circuit boards goes without saying. However, the high-quality standards at Hoffmann + Krippner still require intermediate inspection after each production step, to keep the probability of error as low as possible.



>> Quality seal: „Made in Germany“ <<

INPUT SYSTEMS



Software development as needed

With its team of engineers, H + K offers solutions for various interfaces including USB, Profibus, Profinet and CAN. Evaluation of capacitive keys and functions is not a challenge for H + K. Developers work according to proven programming guidelines and integrate test scenarios to ensure the quality of the software. They define the requirements of the development project and take on the project management. About ten percent of the total workforce at Hoffmann + Krippner works in development and design.

>> When others give up, we step up <<



METAL ENCLOSURES

Electronics in high quality stainless steel enclosures

With a majority stake in TES-Frontdesign GmbH, H + K has been able to expand its expertise to include metal processing and refinement.

Additionally, customized stainless steel or aluminum enclosures in small quantities expand the product portfolio, as does the production of aluminum carriers.

If you want it to be exceptional

Chromated, passivated, anodized and pickled surface finishes also powder-coated with sophisticated fasteners and high-quality finish by grinding, brushing or polishing- there are no limits to the imagination.

Individual customer service

TES places particular importance on individual customer support and a high degree of flexibility regarding special customer requirements. A high degree of vertical integration and careful selection of materials are the foundation for satisfied customers. The transparent work processes at the Neuruppin site and an open and trusting cooperation between customers and suppliers have given the company a strong market position. The close cooperation of the development departments and the production in Neuruppin and Buchen allows even more vertical integration.

>> Careful selection of materials for unique enclosures <<





Plastic enclosures for special applications

Hoffmann + Krippner has a unique partnership with OKW Gehäusesysteme GmbH. Both companies are just a stone's throw away from each other. Together, they develop standard products for medical technology and industrial applications.

High-quality appearance

OKW enclosures not only provide high protection for the integrated electronics, its attractive design and high functionality also appeal to all sectors. The close proximity of both companies ensures fast logistics without additional costs. The design processes are adapted to one another, so that the H + K or TES membrane keyboard or keyboard module with electronics is perfectly matched to the OKW enclosure or that the complete pro-

duct can be delivered assembled. Suitable enclosure series are also available for the installation of touch modules.

Customer-specific enclosures

We can custom-fit enclosures and enclosure parts or supplement them, for example, with metal components. Assemblies of electronic modules, battery compartments, interfaces and breakthroughs are our daily business. However, we also like to develop your customized enclosure design or convert your existing 3D models into a complete product. Whether table or wall housing, handheld or wearable, enclosures for support arm systems or enclosures with protection classes IP 65/66/67: We offer the perfect fit for all applications.

>> Working together – Input solutions in plastic enclosures from a single source <<



FLEXIBLE
INPUT
SYSTEMS



The flexible membrane keyboard as the nucleus of a successful company development

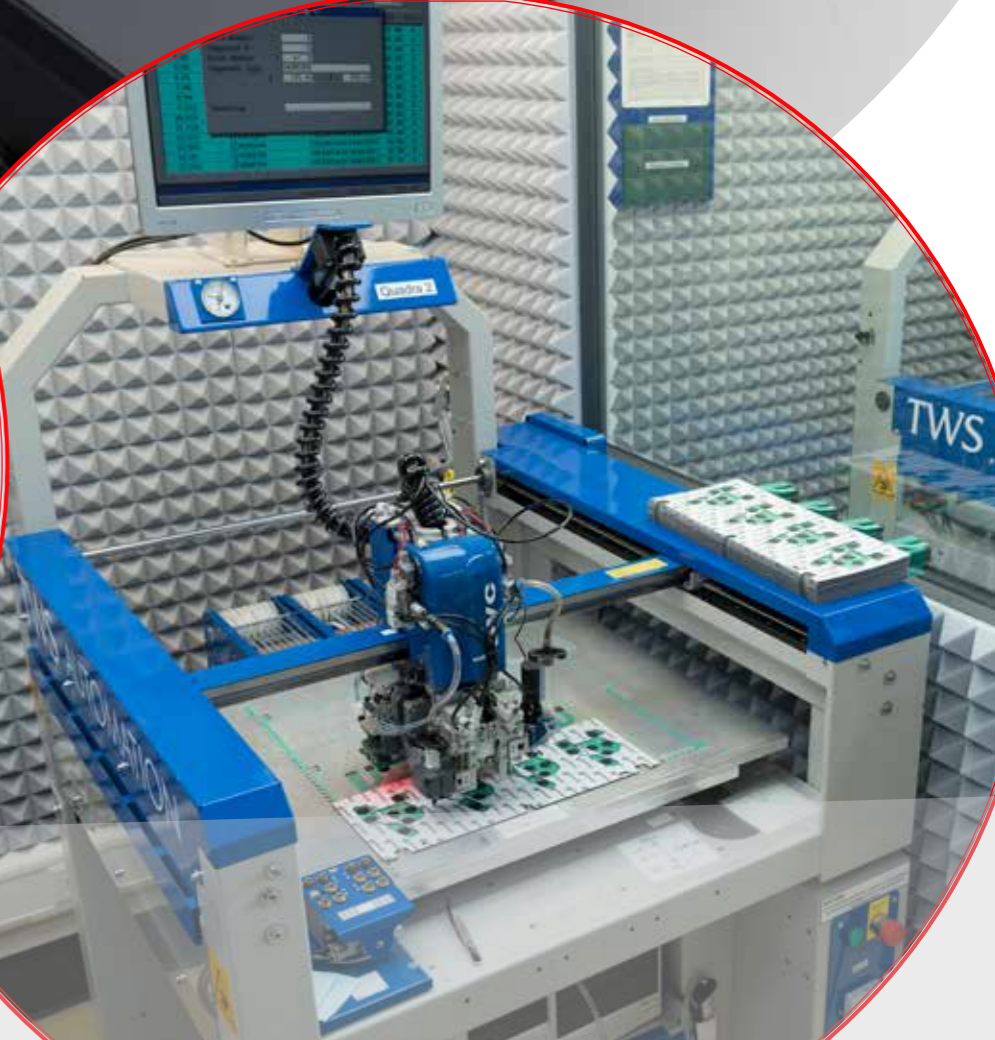
The business card of your product
Through the input, the operator has first contact to the machine. Even during commissioning there is differentiation. Design, quality of components, handling and tactile sensibility: the quality of the entire work is usually derived from the touch.

No limits to the imagination
Virtually all design ideas can be realized with membrane keyboards. Whether rigid, flexible, with or without tactile feedback – depending on the application, membrane switches can offer just the right properties. Reliability and service life are the biggest selling points of Hoffmann + Krippner products.

Let there be light
Thanks to SideLED lighting developed

by H + K, the keyboards can be brightly and homogeneously illuminated. An optional light isolation between the individual keys allows each key to be individually illuminated. The use of bi-color or RGB LED also provides an almost unlimited choice of colors.

Suitable for medical technology
The advantages of this new technology open completely new fields of application for the membrane keyboard. For example, due to its high voltage and frequency, EL lighting is often not permitted in medical technology, while H + K's LED-based keypad lighting is not restricted. Even key illumination in a bright environment can be easily realized with LEDs. Thanks to its extremely flat design, the new keyboard also fits in very flat enclosures.



>> We ensure safe operation even in the dark<<

TOUCH SWITCH



Resistant to chemicals and dirt contamination

Capacitive push buttons and keyboards are particularly suited for applications where high mechanical stress demands an extremely robust input unit. The systems are resistant to acid, dirt and other contaminants. There is no mechanical wear of the contacts. The cleaning is simple, ensures maximum hygiene standards and ensures great chemical resistance, for example, behind glass.

Any key shapes can be realized

A smooth surface ensures comfortable operation even with light touch. The missing tactile feedback can be replaced by optical and / or acoustic signals. The technology enables flat designs and can be used behind glass, plastic or other non-conductive surfaces. Any key shapes can be realized.

>> It's all in the combination: touch systems supplemented by additional capacitive, illuminated function keys <<



PEOPLE



Production Management



GENERAL MANAGMENT
Stefan Kieser



ELECTRONICS PRODUCTION / ASSEMBLY
Thomas Grimm



PRINTING / FABRICATION
Eberhard Heck



PRODUCTION CONTROL
Michael Maier



QUALITY MANAGEMENT REPRESENTATIVE
Anja Schindler

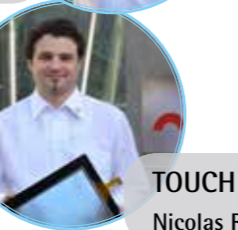
Quality Management



INPUT SOLUTIONS
Siegfried Täubel



SENSORS / IOT
Stefan Berres



TOUCH SYSTEMS
Nicolas Reibel

Product Management

Research & Development

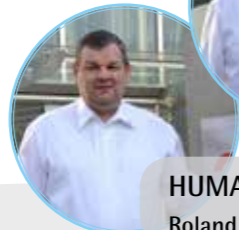


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ADDRESSES

YOUR CONTACT

Hoffmann + Krippner opens new vistas, solves problems and realizes visions in the three main business areas "flexible input systems," "keyboards with electronics" and "modern touchscreen control units."

For – and in cooperation with – you as our customer, we develop innovative and modern products. As your expert manufacturing partner, we assist you with customized project management during the entire development process. Our engineering team is capable of developing and adapting software based on individual application needs. We refine your products – the input unit is the business card for quality and performance.

Our portfolio of production capabilities meets the highest requirements: from simple membrane keypads to complex, unique development with resistive or capacitive touch input – including full surface bonding of displays / optical bonding of touch and display – everything is manufactured in-house at our sure in Buchen, Germany!

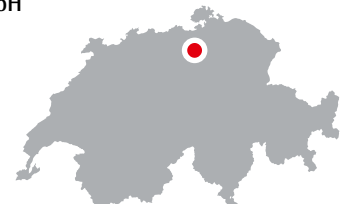
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