

# AUTOMOTIVE BUSINESS UNIT

DISCOVER INNOVATION OF TOMORROW!



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DISCOVER  
INNOVATION  
OF TOMORROW!

## HOLISTIC APPLICATION KNOW-HOW ALONG THE ENTIRE VALUE CHAIN



Uwe Rahn Director ABU

Within the automotive industry, electrification and digitization efforts have driven an increase in demand for electronic components. In particular, components from the semiconductor industry – their performance, availability, or alternatives – retain a significant influence on the success of products. Automobile manufacturers, suppliers, and new protagonists of the tech world are joining forces to develop innovative platforms and operating systems which are accelerating the development of networked, automated and data-driven solutions.

The resulting requirements are becoming more and more complex and short-term. As a broadline-distributor anchored in Europe and with an international presence, Rutronik addresses these requirements with suitable/ customized/ appropriate logistics concepts along the entire value chain. Especially for the mobility sector, Rutronik's Automotive Business Unit contributes expertise from the corresponding industrial network and valuable know-how for holistic solutions at the application level. In combination, this makes the decisive difference when it comes to solving future challenges in the disruptive automotive world of tomorrow!

*„When discussing electrification with the members of our Automotive Executive Community we currently see Battery Management Systems, based on real time information about their condition, playing a major role to raise efficiency and sustainability of vehicles. Vehicles as well as charging infrastructures require more and faster safety applications and depend on solutions that offer a higher ability to integrate conveniently into existing grids. Increasingly smaller installation spaces clearly require design and layout to become ever smaller, smarter and more diverse.“*

# UNLEASH INNOVATION OF TOMORROW!

## Acceleration of the research & pre-development phase due to tailored system solutions

Due to Rutronik's global presence and expert teams of sales staff, applications engineers, and product specialists, we guarantee a highly dynamic, highly professional assistance and support in all technical and commercial matters. Over the years, we accumulated many unique features that have only one purpose: to increase the competitiveness of our customers. We leverage this experience and act as an idea provider and deliver solutions for future applications.

Under the label of Rutronik System Solutions our experts focus their life-long experience, competences and comprehensive product knowledge. Rutronik System Solutions combine the best products based on their features and performance aiming at creating innovative and best-in-class solutions. Thus, we decisively shorten the time-to-market in dynamic industrial environments. Customers gain the necessary decision-making freedom in the research and pre-development phase and a time advantage over competitors.



Innovation and Future DNA

## ABU – Focus on future mobility

The need for competitive advantage characterizes tomorrow's future mobility industry – OEMs as well as further market participants of the whole ecosystem. Especially for the mobility sector, the Automotive Business Unit (ABU) contributes the comprehensive industry network and valuable know-how to holistic solutions at application level. Together, this makes all the difference in solving future challenges in the disruptive automotive world of tomorrow!



Added value guided by the question how our customers become and remain valuable partners for their customers.

**Reference design of a bidirectional 800V / 50A HV switch based on SiC MOFETs**

Today, in a battery electrical vehicle (BEV) lead fuses are used to protect the battery, the wiring and the load from overload or short circuits. Additionally, contactors or relays are used to switch the load on and off. Both components, fuses and contactors, come with inherent drawbacks: Lead fuses are single action products that have to be replaced with a spare part of the same make and type. Replacement has to be done in a repair shop by skilled workers with a high voltage permit. Lead fuses also have a high tolerance in regard to their tripping point. The wiring has to be oversized in order to withstand the upper high tolerance current of the fuse which results in higher weight and costs. Disconnecting a faulty load with a contactor or by fuse-tripping takes time in the range of milliseconds.

In contrast, an electronic fuse (eFuse) combines the functions of protection and switching. Instead of mechanical contacts power semiconductors open or close the load circuit in the range of 3 μs. An eFuse is multi-action capable and requires no spare parts after tripping. An eFuse can be diagnosed and reset from remote via a communication bus. It can be parameterised which makes it software defined. Also, there is no arcing when switching. This makes the electronic fuse also suitable for ex-protected areas or near Hydrogen systems.

Rutronik AUTOMOTIVE's reference design of a HV-Switch can be applied in future vehicles to protect consumers in high-voltage system architectures in the event of failure. A possibly upcoming standardization of protective measures could further raise the bar for new requirements.

Our development pipeline for innovative reference designs is full and there is more to come in 2023. Together with our partners Vishay, Infineon and Elmos we address the upcoming market of Low Speed Electric Vehicles (LSEV) and the applications therein. Reference designs of a traction inverter and an on board charger will be on display at the electronica India 2023 in Bengaluru.

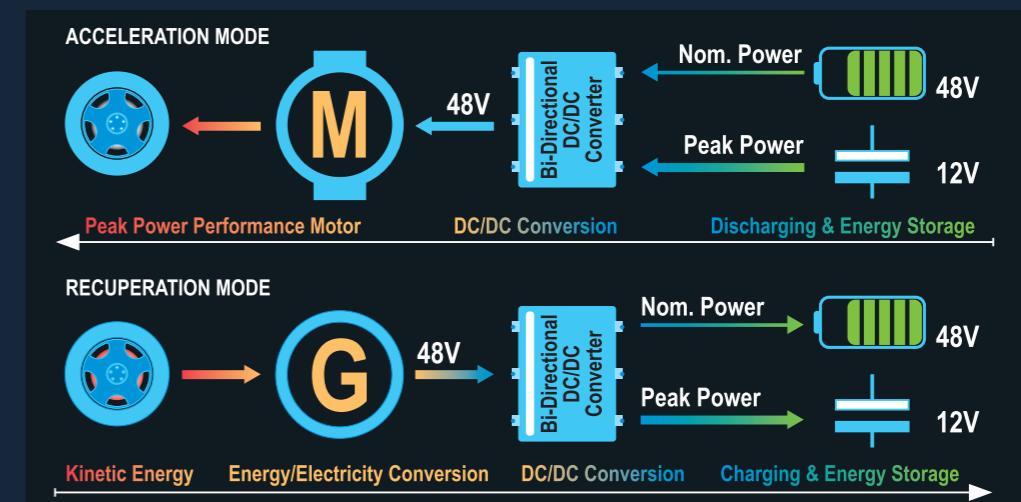


**HESS – Hybrid Energy Storage System – Medium Power Industrial**

The hybrid energy storage system makes use of the advantages of lithium ion batteries and super capacitors. When operating conventional battery-powered industrial systems in combination with highly dynamic loads high-frequency current changes with very high current amplitudes are continuously present. Highly dynamic charging and discharging of supercaps is used to provide or absorb this short-term energy. Only nominal currents are applied to the battery. Uncertainties in the system result from the unwanted and parasitic effects in the electronics of DC/DC converters. Oscillations occur in the system and have to be controlled.

**Benefits of HESS**

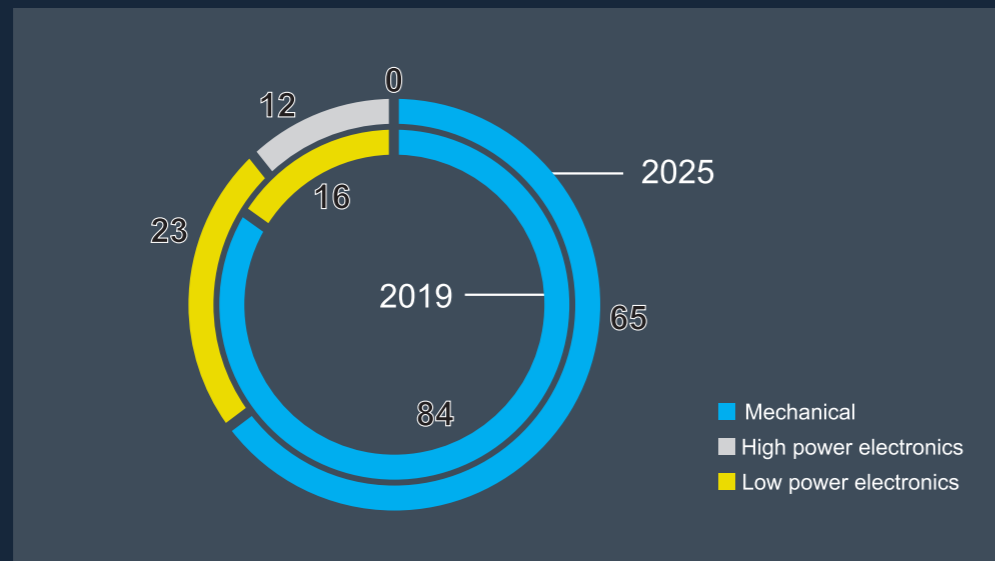
The HESS is available to customers with a complete bill of materials (BoM). All components, from the semi- conductors to the supe capacitors and Li-ion battery cells are available from Rutronik's wide range of franchised manufacturers. In addition, Rutronik provide customized solutions of the HESS to enable added values underlying safety, protection & liability of the battery packs.



## AUTOMOTIVE BUSINESS UNIT

The value of electronics in vehicles is growing steadily, especially with the advent of advanced driver assistance systems (ADAS) and electric vehicles. At the same time, the electronic components market is subject to its own characteristic cycle of availability. These conditions in the supply chain are a particular challenge for market participants.

### Value share in premium vehicles in %



Steadily growing value of electronics in vehicles

The Rutronik Automotive Business Unit (ABU) focuses on the most important innovation topics in the industry. With access to the entire technical know-how at Rutronik, the automotive experts offer professional support. The best-of-class products are available to customers via the specially selected focus component manufacturers.

### International distribution know-how

In addition, the cross-country and cross-site structure guarantees consistent support worldwide. The unique combination of expert knowledge, networks, and comprehensive distribution know-how makes ABU the ideal partner for all topics relating to the future of electric mobility.

### Link between manufacturers, customers and partners

Rutronik provides a broad portfolio of products from manufacturers with an impressive track record especially for automotive applications meeting highest quality demands placed on production and manufacturing processes. In their respective segments, they are among worldwide market leaders and constantly working on innovative components for future applications.

ams OSRAM | Bosch AE | DIODES | Elmos | Infineon | Kyocera AVX | ROHM | Rubycon  
Samsung Electro-Mechanics | TDK Micronas | Toshiba | Vishay

### Clients across the whole value chain

Our customers, suppliers and participants of our exclusive network cover all perspectives and areas of the value chain.

- ABU advises engineering offices and development departments of Tier-1 on the selection of the latest components
- With EMS we discuss second sources, prices and availability
- OEMs receive advise on how to solve logistics issues in their global supply chain
- We also discuss changes and new opportunities - be it in the professional or organizational area

Auto Kabel | Delta | Dr. Schneider | Dräxlmaier | Eberspächer | Fischer Automotive | Grammer  
Harman Automotive | HKR Automotive | Huber Automotive | Inovis Joyson | Kendrion | Kongsberg  
Kostal | Kromberg & Schubert | Küster | Leoni | Litens | Mercedes-Benz Group | Nidec  
Novem | Panasonic | Pass | Pierburg | Preh | Prettl Automotive | Rausch & Pausch | Silver  
Atena | Stabil Elektrotechnik | TI Fluid Systems | Voss | Webasto | ZF

### Business partners and associates

With their exclusive events Rutronik ABU creates a highly professional and familiar environment for our business partners, our customer base, as well as our suppliers, and automotive industry experts to exchange and interact. In close collaboration with these, Rutronik combines perspectives, knowhow and competences to identify new trends and market opportunities at an early stage that can directly speed up development phases and be incorporated into new reference designs or applications.

## AUTOMOTIVE EXECUTIVE COMMUNITY

There is an immense need for information and cooperation due to the disruptive changes in the automotive industry. The Automotive Executive Community (AXC) is the forum for cooperation and information exchange for the most important automotive market participants.

### Exchange on expert level

The AXC brings together decision-makers from OEMs, Tier-1, and Tier-2 as well as leading manufacturers of electronic components to form an exclusive community of experts. The Automotive Executive Community opens up opportunities that would otherwise remain closed at a strategic or operational level.

### Annual ABU Congress – acknowledged summit for the mobility industry

Since 2018, Rutronik Automotive Business Unit has been organizing their AUTOMOTIVE Congress in Pforzheim. As part of the activities of the Rutronik Automotive Executive Community, the congress is established as an acknowledged industry meeting platform for decision makers and opinion leaders at management level. With keynotes, presentations and market insights from OEM, Tier-1 and component manufacturers the congress offers an interesting mix of topics and perspectives.

These topics are matched with latest news from the university research environment, upcoming trends, market studies by analysts and the strategic outlooks from our leading manufacturers of electronic components and market insights.



## AXC – YOUR BENEFITS

### NETWORKING – Get connected!

The Automotive Executive Community is a community of leading experts from all areas of the automotive industry: OEMs, Tier-1, Tier-2, and engineering providers and contract manufacturers (EMS). The network at the highest level connects all relevant players in the industry who meet at trade fairs and events. These include, among other things:

- Rutronik AUTOMOTIVE Congress
- Events as part of Rutronik Racing's activities
- International network meetings

### MANAGEMENT TALK – Discuss the future!

The Automotive Executive Community discusses and analyzes the future of mobility and thus, the strategic and forward-looking issues in the industry. The community offers the opportunity to exchange experiences and ideas at the highest level.

### COOPERATION – Gain insights!

The Automotive Executive Community brings together experts from different fields. Participate in the areas of expertise of high-ranking representatives of the automotive industry as well as market researchers, analysts, and other industry experts.

One thing is certain: Our network partners know from experience what they are talking about!

### EXPERT KNOWLEDGE – Stronger together!

The Automotive Executive Community offers a wide range of opportunities for cooperation: Informal talks, participation in events and trade fairs, exclusive specialist events by our partners, automotive road shows and fab tours, including a large number of added benefits and presentation opportunities.

## AXC – PROMOTION PACKAGES

The Automotive Business Unit offers further benefits with cooperation packages. Obtain access to an exclusive network such as the Automotive Executive Community and numerous events like the internationally successful ABU Congress. You can also benefit from extensive promotional opportunities with which you can present yourself, your company, capabilities and its range of services.



### PREMIUM

#### ■ Participation in ABU events

ABU Congress including specialist lecture and product presentation as well as networking opportunities during the gala event

Electronic fairs such as: Electronica, Embedded World, PCIM, Sensor+Test

ABU Technology trade fairs with the new Rutronik event truck at a location of your choice

#### ■ Technical support

ABU FAEs support the Design-In for new projects, product selection, first price indications, contacts to EMS, and leading engineering providers in the automotive industry

Product promotion in ABU Rutronik Application Guides: Recommendations for circuit topologies and components from leading manufacturers of our line card

Technical Supplier Feedback: Access to current market information and forecasts of requirements in innovative automotive projects

#### ■ Publications

Specialist articles and logo placement in the specialist magazines Automobilwoche, Markt & Technik, and Rutroniker, as well as online media (ABU homepage, Twitter, YouTube, LinkedIn, XING)

**Premium Package: 15,000 EUR**

### EXCLUSIVE\*

#### ■ Participation in ABU events

ABU Executive Community: Events at different locations throughout the year with promotion and presentation opportunities for our guests

ABU Executive Community Event during the Automotive Conference (eAC) at electronica Munich: Networking and knowledge exchange with decisionmakers and experts from the automotive supply industry

ABU Congress: Image & film material of your presentation and opportunity for networking during the gala event and congress

ABU roadshows with component manufacturers: Exclusive product promotion including giveaways and logo placement at the event location

Exclusive supplier fab tours: Factory tours with information on the latest technologies and application processes in the global semiconductor industry

Cooperation on innovative ABU reference designs for the future worldwide electromobility market

#### ■ Publications

Specialist articles in leading magazines

**Exclusive Package: 30,000 EUR**

\* Includes all services from the Premium Package

## RUTRONIK RACING

### Motorsports – The environment to put components and applications to the hard test

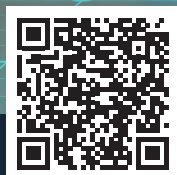
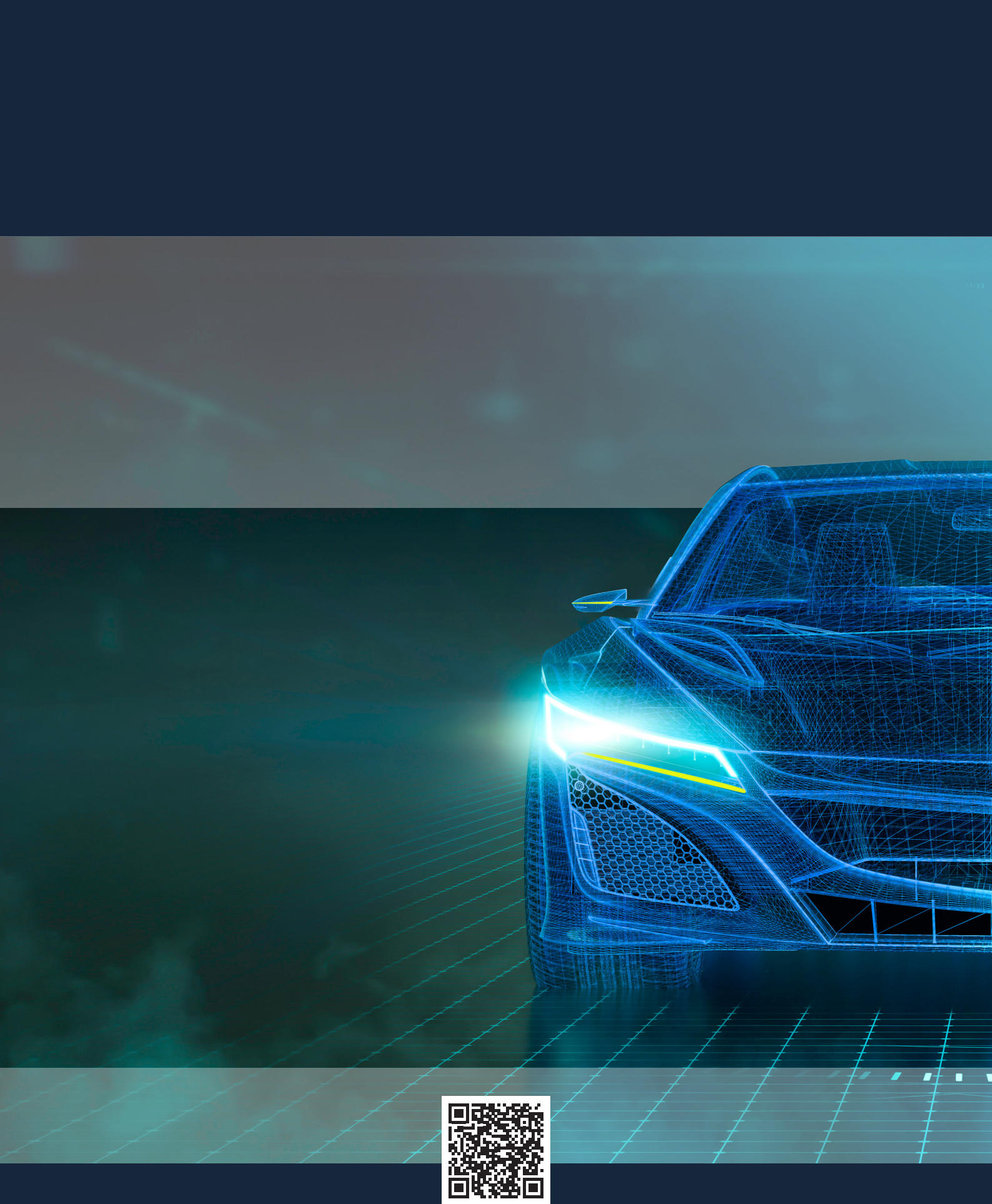
Rutronik Racing was founded in 2010 and from the beginning Rutronik Elektronische Bauelemente GmbH supported the team and became title sponsor in 2015. Motorsports is a highly competitive and challenging environment for all contributors of the value chain to proof their concepts. Being a part of it, Rutronik gains insights and knowledge in terms of performant and reliable solutions which is incorporated in own R&D activities.

This year, the team participates in the 24h races as factory team together with Porsche Motorsport. Besides its passion-driven commitment, Rutronik draws valuable knowledge about components and applications from this high-performance automotive environment.

In 2023, the Automotive Executive Community also meets at selected events of the GTWC Europe Endurance Cup racing series at various race tracks and brings industry talk directly to the source of information and insights.







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