

# intouch

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# Trend electrification – EAO is part of it.

## Editorial

Dear customers and partners

*In this intouch we take you into the world of electrification of modern vehicle interiors. You will learn how EAO develops flexible HMIs that meet evolving requirements. We will also show you how EAO uses the example of the IATF 16949 standard to further improve customer service. We'll also show you the benefits of INEOS' rugged Grenadier - also thanks to our HMIs. Our HMI solutions also prove their versatility in special vehicles.*

*Last but not least, learn all about our new website with its intuitive online product configurator that will delight you.*

*Have fun discovering!*

David Kramer  
Head of Corporate Communications

## New technologies and changing requirements for modern interior vehicle design require flexible and innovative solutions.

*Versatile and secure HMIs play a central role here.*

Increasingly stringent conditions concerning emissions and noise control, scarce resources as well as rising goods and service traffic are essential factors for the mobility of the future – particularly given the ever-expanding scope of metropolitan areas worldwide.

### **New drive systems require new control concepts**

The changeover to electric drive systems enables new, simplified control concepts. In the electric commercial vehicle and delivery van market in particular, it is essential that controls are the right balance of intelligent and haptic. Control via touchscreen is a convenient option for some functions, and typically associated with comfort. However, tactile feedback and rapidly find-

ing the relevant button is important to users, particularly for work- and safety-relevant vehicle functions; at the same time, it is critical that the driver is not distracted. Haptic HMIs minimise the risk that the driver will divert their line of sight from the road in order to operate a function – which increases safety in road traffic.

### **Individual advice from experts**

Using HMI components and systems from EAO in electric vehicles offers striking benefits in terms of design, individuality and high quality. We will adapt the versatile EAO product range to your individual designs, colour concepts, and other specifications. Our products also meet complex demands in terms of safety and user comfort, both for the vehicle interior and for components which are exposed to the outdoors when operating electric vehicle charging stations.

EAO is your reliable partner for the development of impressive solutions that precisely correspond to your specific needs. We find solutions for you that exceed your expectations – in haptics, optics and precision.

### **Versatile Universal Switch for safety-relevant applications**

As an electric vehicle manufacturer, you need reliable products that you can adapt to your vehicles in the way you want. The Series 09 Universal switch combines the highest concentration of technical features that are ideal for use in elec-

tric vehicles. Featuring many freely configurable product variants, the Universal switch is so versatile that it can be used for almost any function in the vehicle interior. With diagnosis capability thanks to resistance coding (Namur) as well as the option of two redundant switch signals, the Universal switches are proven for safety-relevant applications in particular.

The Series 09 Universal Switch is the best choice for numerous applications and is unique on the market with its variety of possibilities.

Read more on our website:  
[www.eao.com/electric-vehicles](http://www.eao.com/electric-vehicles)



## International trade fairs 2024

Meet our experts and see the latest HMI technologies and solutions. Here you will find all information about our participation in international trade fairs:  
[www.eao.com/trade-fairs-and-exhibitions](http://www.eao.com/trade-fairs-and-exhibitions)



*As an electric vehicle manufacturer, you need reliable products that you can adapt to your vehicles in the way you want.*





# IATF standard – uncompromising customer focus.

The IATF 16949 standard thoroughly audits the planning, processes and structures of companies – EAO customers can benefit from this rigorous analysis.

*The requirements of the IATF standard are the basis for the development and production of our products for the automotive industry.*



The automotive industry demands top performance in design, technology, safety and quality. The IATF (International Automotive Task Force) is a workgroup that deals with the harmonisation of standards to improve product quality for automotive customers. The automotive standard IATF 16949 puts customer satisfaction at the centre: whether it is corporate management, production or procurement – all established corporate processes serve reliability. The IATF standards ensure high quality, secure deliveries, product conformity and traceability in the supply chain and encourage active communication with our customers. These standards also benefit our Series 09 range.

#### Uncompromising customer focus

IATF 16949 harmonises quality management systems within the automotive industry worldwide. The task force reinforces the requirements of the ISO 9001 standard for the automotive industry and thus deeply intervenes in companies. Quality management requires that internal processes are regularly monitored, performance is evaluated and helps drive continuous improvement. Products are developed and validated according to customer-specific specifications. Thus, IATF 16949 mitigates a whole range of risks that the ISO standard does not yet address.

For our Series 09, this means that EAO must continuously ask itself: Do the products deliver what we promise? How do we prevent even accidental risks – in development, procurement, or manufacturing? The entire supply chain is



Series 09 Universal Switch.

geared to these high requirements. With proven stable and efficient processes and seamless traceability.

#### Added value for EAO customers

High customer satisfaction is the top priority of IATF 16949. But how does it deliver on this promise? What are the concrete benefits to our customers?

The IATF standard ensures:

- Consistent quality of products and processes thanks to controlled and documented production with accompanying tests and defined approvals throughout the entire supply chain. All products that leave our factory are functionally tested.
- Security of supply thanks to functioning emergency concepts with monitored delivery reliability at suppliers and the systematic prevention of possible errors and failures in the manufacturing process.
- Conformity of products according to the requirements. From the quotation, through to product development, series production and delivery, with validation, monitoring and testing carried out on an ongoing basis.
- Traceability thanks to consistent labelling and documentation of individual parts. A barcode on the product allows test results, production date and the origin of raw materials to be traced through the supply chain.

- Proactive communication with customers and suppliers - as a condition of this standard. Every relevant change in production is discussed with the customer in a defined process. All those involved are thus always informed at an early stage. This makes proactive reactions to changes possible.

- Continuous improvement of performance. How can the products be optimised? How can production be made more stable and resource-efficient?

- Independent assessment and certification by accredited external testing service providers.

As an experienced automotive supplier, we work hard to ensure our production site in Auerbach, Germany is certified to meet all the requirements of IATF 16949, and our processes consistently record high levels of customer satisfaction. The innovative Series 09 product exemplifies our commitment to making high-quality, resource-efficient, long-lasting products.

Read more about our expertise in automotive products and our IATF 16949 production process: [www.eao.com/s/automotive](http://www.eao.com/s/automotive)





# No job is too tough for the INEOS Grenadier.

The Grenadier is a dedicated off-road vehicle built for any terrain. Its interior needs to be durable too – so every stitch and surface is designed to fulfil that assignment. INEOS puts its trust in interior HMIs from EAO.

Unbreakable British spirit. British design combined with German engineering: the Grenadier is an uncompromising 4x4 vehicle which has been entirely designed, from scratch, to overcome any obstacle by means of unrivalled off-road capability, endurance, and reliability. Engineered for drivers all around the world who rely on their vehicle as a vital work tool.

Over the last five years, INEOS Automotive has taken an uncompromising approach to engineering, testing, and development. The Grenadier has been on a 1.8-million-kilometre odyssey of testing in multiple stages and almost every environment imaginable: mountains, forests, rivers, seas, mud and sand, minor roads and motorways, wilderness and city streets. This worldwide expedition serves to ensure that the Grenadier can do its job in all test phases, on difficult terrain worldwide, at 50°C or in

A reliable accessory for INEOS interiors: the Series 09 Universal Switch.



The uncompromising all-wheel drive vehicle from INEOS – the Grenadier.

freezing temperatures. Now INEOS is ready to launch this rugged new off-road vehicle which is built to go the distance.

Onboard to help the Grenadier handle every challenge are the Series 09 Universal Switches from EAO. The ergonomically designed Universal Switch features IP5K4 front protection, to prevent the ingress of dust in harmful quantities as well as splash water from all angles.

This is a must-have in an off-road vehicle. The diagnostic capability facilitated by resistance coding (Namur) and the option of two redundant switching signals make the Universal Switch ideal for safety-related applications. It also means that the Universal Switch configuration which has been individually customised for INEOS can be used for locking differentials, for example: at the push of a button, wheels rotating at different speeds can be locked so conditions such as snow, ice, slick surfaces, and mud present no difficulty.

## Benefits of use

- Customer-specific design and tailored configuration options for an HMI that is genuinely up to the task
- Ergonomic, robust design with IP5K4 to meet the challenges encountered by off-road vehicles
- Ideal for safety-related applications thanks to its diagnostic capability (Namur) and the option of two redundant switching signals

The versatile Series 09 switch is the best choice for many applications and has a range of options that make it one-of-a-kind on the market. The team of experts at EAO Automotive were pivotal to developing and evaluating the ideal HMI solution for the tough, durable INEOS off-road vehicle – we are immensely proud to have contributed to a project as exciting as the Grenadier.





Operating units for refuse collection vehicles have to meet a variety of challenges.

## HMI requirements for special vehicles.

With the wide range of special vehicle applications and many varied requirements for HMI switching solutions, EAO takes into account ergonomic design principles, technical requirements and legal compliance issues to provide you with the optimum HMI for your application.

EAO's HMI Components and Systems are ideal for special vehicles due to their ergonomic design, their wide range of configurations and their high-quality. As an expert partner, we support you in selecting the best switches and keypads – to suit your application. Using the example of a garbage truck (below) we have highlighted the most important design considerations in selecting an HMI.

### Environmental conditions

HMI for garbage trucks must be robust and reliable in both outdoor and indoor environments. Of central importance when developing HMIs for outdoor use are the challenges around

weather, temperature fluctuations and sometimes aggressive cleaning agents or high-pressure cleaning equipment to which they are exposed in use. A high IP front protection rating is very important, especially for outdoor applications.

### Safety, standards and approvals

When moving and operating special vehicles, the focus is still on people. Safety is correspondingly important. This is why compliance with the relevant standards and approvals is of central significance. Besides functional safety topics in accordance with EN ISO 13849, the EN 15-1:2021 standard is particularly relevant

for garbage trucks. It states that all control and monitoring units on the outside of the vehicle must be arranged, positioned and labelled in such a way that they are clearly visible to the user at all times and can be easily and permanently identified. The functions that are to be triggered with the control and monitoring units must be clearly and permanently marked. This is where graphic symbols according to EN 60204-1:2006 play a central role. The standard for garbage trucks also specifies that the control units must be secured against unintentional contact or even faulty operation in order to prevent uncontrolled movement, for example from the lifting device. The EN 3741 standard also defines the size of the HMIs. For example, the pushbuttons must have a minimum diameter of 20mm so that they can be operated easily and reliably even when wearing work gloves.

### Operating concept and usability

Many of the above requirements directly influence the user-friendliness of the HMI design: a sensible arrangement of the controls and functions, easy location of the HMIs and simple operation, even with work gloves. However, the

operating concept for the design can be further improved. For example, HMIs can make work easier in difficult lighting conditions, such as at dusk, by providing good lighting, or they can simplify the flow of work processes by providing visual feedback. It is therefore important to consider the lighting and feedback options of operating units when selecting the appropriate HMI.

### EAO's solutions for garbage truck applications

We are convinced that our 6 or 8-pushbutton Series 09 Rugged Keypads fulfil all the requirements regarding environmental influences, approvals, safety standards and operator usability.

Our Series 09 Keypads feature rugged construction with environmental protection up to IP69K, their robust design makes them ideal for outdoor use. The interchangeable pushbuttons can be marked with any ISO 7000 symbol or a custom symbol and can be supplied in a range of different symbol insert colours. In this way, the Series 09 offers you all the possibilities to meet the requirements for easy identification and recognition of the functions referenced in the vehicle standards.

*Your individual operating concept, our ideal solutions.*



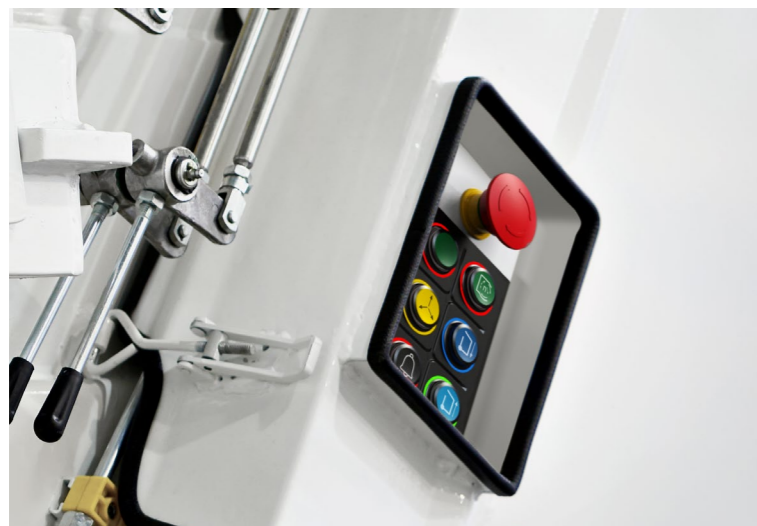




Robust, flexible and programmable – the ideal solution for use in refuse collection vehicles.

The flexible arrangement of the pushbuttons, the intelligent and programmable illumination options as well as the freely available symbols ensure the optimum arrangement and user-friendliness for each individual application. The symbols of the Rugged Keypads are not only illuminated but also abrasion-resistant and resistant to direct UV radiation. This makes them easy to find, highly visible and durable.

For our HMIs, the focus is still on people and their safety.



In addition, the Series 09 keypads are ideal for use in functionally safe applications in accordance with the safety requirements of EN ISO 13849. Apart from numerous safety-relevant hardware and software features, the keypads also fulfil the service life and reliability specifications required for these applications, such as MTTF, B10 or FIT.

The Protective Shroud accessory for the Series 09 Rugged Keypads offers users additional finger guidance by separating the pushbuttons. At the same time, the keypads are protected against unintentional touch and operating errors, and the Protective Shroud makes them even more resistant to external influences.

Example Rugged Keypads	Requirements EN 1501-1:2021	Your benefits as customer
	<p>Optimal arrangement and perfect positioning, easy identification and recognition of the control and monitoring units</p>	<ul style="list-style-type: none"> <li>Robust design: Suitable for use in any position, without the need for additional protection from weather or possible impacts etc.</li> <li>Individual and flexible arrangement of symbols with interchangeable symbol inserts</li> <li>Intelligent and programmable lighting features for easy identification of functions and status</li> <li>Freely available symbols according to ISO 7000/IEC 60417 or customer-specific symbols</li> </ul>
	<p>Permanent marking of the symbols, always and clearly visible function</p>	<ul style="list-style-type: none"> <li>Highly abrasion and direct sunlight (UV) resistant symbols with special PU surface coating</li> <li>Individual symbol illumination</li> </ul>
	<p>Protection against unintentional touching and any kind of incorrect operation</p>	<ul style="list-style-type: none"> <li>The optional Protective Shroud offers additional protection against unintentional actuation and isolates each separate pushbutton in the keypad</li> </ul>
	<p>Operability with work gloves</p>	<ul style="list-style-type: none"> <li>Keypads with pushbutton sizes of at least 20mm according to EN 1501</li> <li>Series 09 Protective Shroud separates the keys and results in an additional finger guide</li> </ul>

Would you like to find the ideal interior or exterior HMI Solution for your special vehicle? Contact your local EAO Expert Partner – we will be happy to discuss any special requirements, understand your specific needs, offer advice, and collaborate on a solution with the optimum components and systems for your application.

**Video**

You can see an example of how the robust Series 09 Rugged Keypad with 8 pushbuttons can be integrated into the operating concept of a garbage truck in our application video on YouTube:





Multifunctional programming.

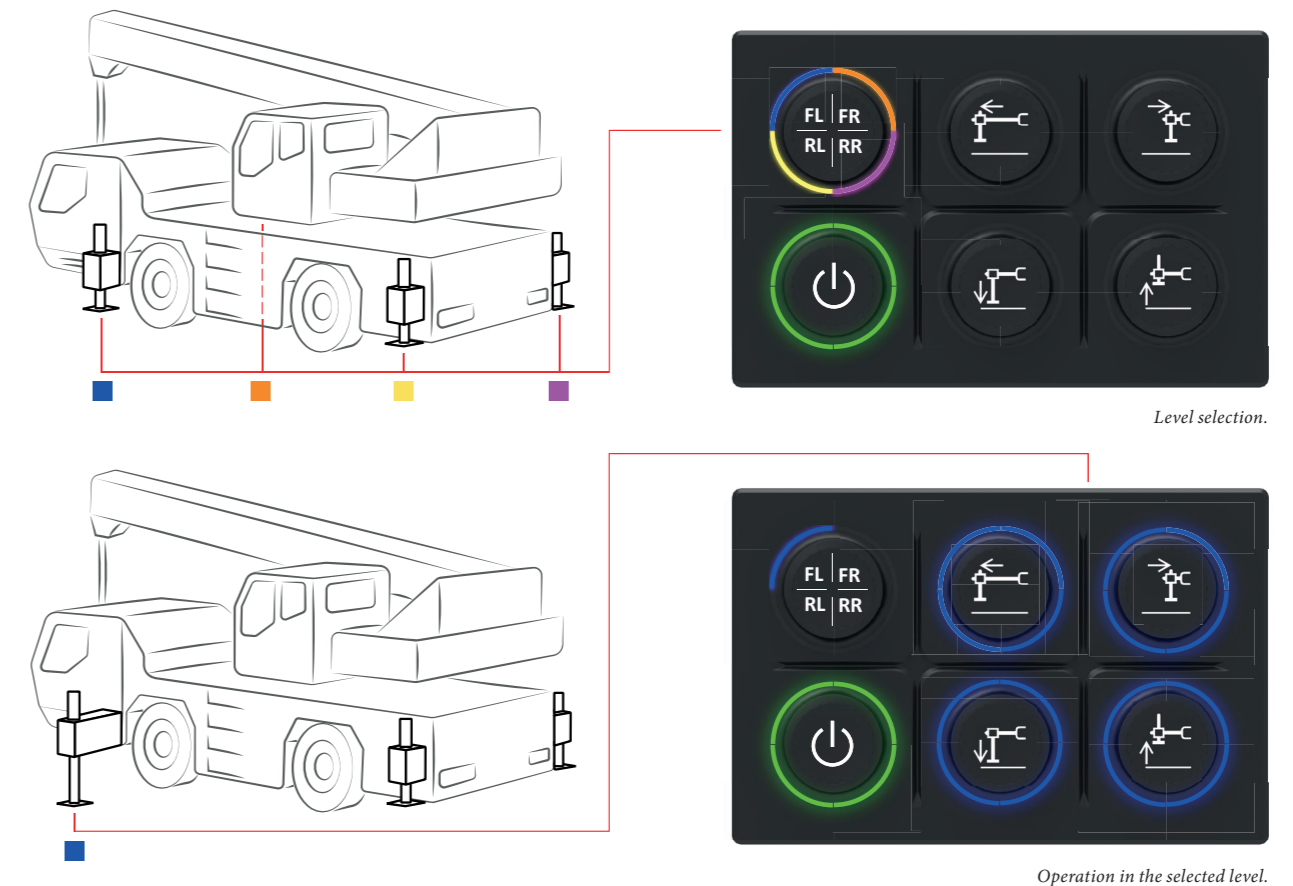
# For your customised operating concept.

Dynamic status displays and individual function levels for your customised operating concept – thanks to the unique programmable illumination features of the Series 09 Keypads.

The keypads of our Series 09 offer freely programmable illumination features thanks to a 4-segment RGB Halo Ring illumination, depending on the product variant. In addition to the visually appealing appearance, these unique illumination options also open up fascinating possibilities for dynamic status displays or the programming of intelligent function levels – for ideal and secure integration of your application.

### Dynamic status indication – for an optimal overview

The 4-segment RGB halo ring illumination feature of the keypads is designed to enable dynamic status displays. These include the visualisation of fill levels, safety-critical positions within the application or step-by-step speed control. They always provide users with real-time feedback on the respective operating status. The colour differentiation as well as the option to have the four segments light up, flash, pulsate or rotate guarantee intuitive operation and intelligent embedding in a customised operating concept. This way, users know at a glance, at any time, in which operating state, or at which functional step our application is the currently in. Ideal for your intuitive operating concept.



### Intelligent programming – more functions, less complexity

The programmability of the keypads and the illumination features make it possible to create individual function levels. Instead of a cockpit with numerous control elements, different functions can be superimposed on top of each other on the keypads. This reduces your space requirements and costs, while the ease of use increases considerably. The example of the Rugged Keypads with 6 pushbuttons (see illustration) shows how the first pushbutton can be used to select the corresponding function level, which then defines the detailed operating function for the remaining pushbuttons. As soon as the user selects another level, the same buttons can take on another function. This offers you enormous added value and simplifies operation considerably.

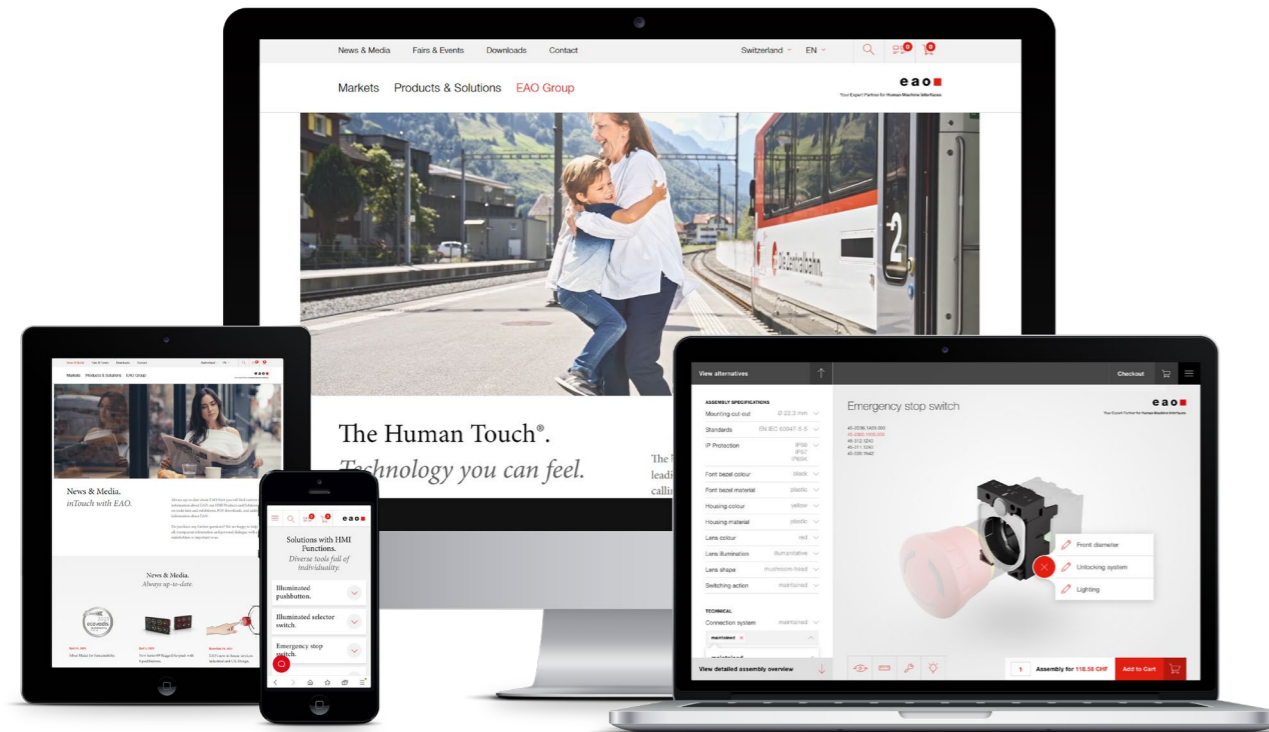
mination features, unique on the market, are an outstanding advantage that will take your application to a new level.

Interested in our versatile illumination possibilities? You can find various application videos on our YouTube channel:  
<https://www.youtube.com/eaoswitches>



The 4-segment RGB halo ring illumination and its intelligent programmability not only offer an attractive appearance, but also ensure intuitive operation of the Series 09 Keypads. These illu-





# EAO launches new website.

User-friendly and modern – the new EAO website.

Easy to navigate, tailored to the target audience and in a modern design: the new EAO website [www.eao.com](http://www.eao.com) has got a new shine. The online entry for the world's leading HMI developer now showcases user-friendly information architecture, a smart product configurator and striking imagery. With eight languages available, the website is able to address individual national and regional dialogue groups as well as to present country-specific content.

The requirements for the new EAO website were set at a high level. Users had to be able to quickly and easily access any information they need – from individual products or data sheets to appropriate contact persons. “Our intention with the new website was to incorporate the needs of engineers, purchasers and executives in particular. We want to be presenting them with specific arguments in favour of EAO solutions and then quickly guiding them to the appropriate product or relevant content,” says David Kramer, Head of Corporate Communications at EAO. The new website succeeds in doing exactly that, thanks in particular to its intuitive navigation and search function.

## Product experience: target-group-specific access and integrated configurator

The Human Machine Interfaces that EAO offers are incredibly diverse in terms of application areas and functions. To ensure users can find their way to what they need, the website has been designed with an emphasis on navigation and to include a range of search options. Users can search for specific content and products by product function, market or series. The full-text search feature also ensures a high hit rate and can be used to search by keyword or article number. This is where the seamless connection between the corporate website and the configurator becomes especially significant: as well as returning content pages containing text, photos and videos, search results also include actual products that can be directly configured online. Up to 1000000 product variants are available for all key HMI functions.

## Buying experience: inform, configure, purchase

Throughout the user's journey in the EAO online world, the shopping basket and comparison list are always just a click away. This makes it sim-

ple for visitors to switch between configuring a product and gathering information as they browse. Any configurations can be saved and additional variants created. The product comparison list continuously displays the differences between designs in an intuitive, comprehensive manner. In addition, users can download the CAD data for their configurations in all formats, for immediate use. Brochures, data sheets, certificates and more can be quickly located in the download centre by using appropriate filters, meaning that users can access all the marketing and product information they need in a single place. Once you have successfully configured your product, EAO ensures a consistent buying experience right up to checkout by integrating its global distributors into the process.

## Brand Experience: unmistakable design and storytelling

Web experience with storytelling: text, photos and video stories on the website offer users a holistic experience that will leave them wanting more. EAO has given a lot of attention to consistent storytelling here, deliberately embedding video and campaign communications into the website so that different content and formats can be displayed on a variable basis. This approach ensures the website is not just a source of information or a product configurator, but also a place where customers remain engaged by punchy graphics, videos and text elements – all presented in line with the EAO corporate design. The discreet colour scheme and clear, legible serif font contribute to the high-quality appearance of the website, and a responsive design means it performs as intended on all end devices, from PCs and smartphones to tablets and laptops.

EAO is a global company so its website offers eight different languages, including Chinese and Japanese. This brings EAO's global sales companies even closer together under a single,

strong umbrella brand, and makes it possible to appeal – directly and on a country-specific basis – to various target and dialogue groups in their individual markets.

David Kramer, Head of Corporate Communications at EAO, is delighted about the successful relaunch of the website: “The new website exemplifies our efforts to always make things as easy as possible for our customers. At the same time, the website makes our brand values and brand promise wonderfully tangible.” The new website impressively underlines EAO's reputation as a reliable global partner for Human Machine Interfaces (HMI).

## New EAO Website

Fast, user-friendly and innovative – that's the new EAO website. Watch this video to see the versatile functions and key features that will help you find the right information.

You can find the video on our YouTube Channel or directly via the following QR Code.





# EAO Contact.

## *Your centre of excellence.*

### Headquarters

**EAO Holding AG**  
Tannwaldstrasse 88  
CH-4600 Olten  
Telephone +41 62 286 92 00  
info@eao.com

### Manufacturing Companies

**Switzerland**  
**EAO AG**  
Tannwaldstrasse 88  
CH-4600 Olten  
Telephone +41 62 286 91 11  
info@eao.com

**EAO Systems AG**  
Tannwaldstrasse 88  
CH-4600 Olten  
Telephone +41 62 286 91 11  
sales.esy@eao.com

**China**  
EAO (Guangzhou) Ltd.  
3/F, Block G4, South China  
New Materials Innovation Park  
31 Kefeng Road  
Guangzhou Science City  
CN-Guangzhou, PRC  
Telephone +86 20 3229 0390  
sales.ecn@eao.com

**Germany**  
EAO Automotive GmbH & Co. KG  
Richard-Wagner-Straße 3  
DE-08209 Auerbach/Vogtland  
Telephone +49 3744 8264 0  
sales.esa@eao.com

**North America**  
EAO Corporation  
One Parrott Drive  
Shelton  
US-CT 06484  
Telephone +1 203 951 4600  
sales.eus@eao.com

### Sales Companies

**China**  
EAO (Guangzhou) Ltd.  
3/F, Block G4, South China  
New Materials Innovation Park  
31 Kefeng Road  
Guangzhou Science City  
CN-Guangzhou, PRC  
Telephone +86 20 3229 0390  
sales.ecn@eao.com

**EAO (Shanghai) Office**  
Rm.401, Lihpao Plaze,  
NO.159 Shenwu Road,  
Minhang District,  
CN-Shanghai, 201106.  
PRC  
Telephone +86 21 6095 0717  
sales.ecn@eao.com

**France**  
EAO France SAS  
27 rue Maurice Flandin  
FR-69003 Lyon  
Telephone +33 426 298 588  
sales.efr@eao.com

**Germany, Austria, Czech Republic, Poland, Slovakia**  
EAO GmbH  
Langenberger Straße 570  
DE-45277 Essen  
Telephone +49 201 8587 0  
sales.ede@eao.com

**Hong Kong (Asia Pacific)**  
EAO (Far East) Ltd.  
Unit A1, 1/F, Block A  
Tin On Industrial Building  
777 Cheung Sha Wan Road  
Lai Chi Kok, Kln  
HK-Hong Kong  
Telephone +852 27 86 91 41  
sales.ehk@eao.com

**Italy**  
EAO Italia S.r.l.  
Centro Direzionale Summit –  
Palazzo C1  
Via Brescia 26  
IT-20063 Cernusco sul Naviglio (MI)  
Telephone +39 029 247 0722  
sales.eit@eao.com

**Japan**  
EAO Japan Co. Ltd.  
Net 1 Mita Bldg. 3F  
3-1-4 Mita Minato-ku  
JP-Tokyo 108-0073  
Telephone +81 3 5444 5411  
sales.ejp@eao.com

**Netherlands, Belgium**  
EAO Benelux B.V.  
Kamerlingh Onnesweg 46  
NL-3316 GL Dordrecht  
Telephone +31 78 653 17 00  
sales.enl@eao.com

**North America**  
EAO Corporation  
One Parrott Drive  
Shelton  
US-CT 06484  
Telephone +1 203 951 4600  
sales.eus@eao.com

**Switzerland**  
EAO Schweiz AG  
Tannwaldstrasse 86  
CH-4600 Olten  
Telephone +41 62 286 95 00  
sales.ech@eao.com

**United Kingdom, Denmark, Finland, Ireland, Norway, Sweden**  
EAO Ltd.  
Highland House  
Albert Drive  
Burgess Hill  
GB-West Sussex RH15 9TN  
Telephone +44 1444 236 000  
sales.euk@eao.com

### Editor

intouch –  
the EAO customer magazine

EAO AG  
Tannwaldstrasse 88  
CH-4600 Olten  
Telefon +41 62 286 91 11  
communication@eao.com  
www.eao.com