

EAO Transportation

Punctual. Intuitive and reliable.

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We are always on the move and bridging distances. Both in day-to-day life and to discover new things. Since 1947, EAO Transportation has been providing the safety and trust this requires.

“My day-to-day life. My world.”
EAO creates possibilities.



Our products and solutions are as intuitive and reliable as expected within the transportation industry.

EAO develops and produces high-quality HMI Components and Systems for the public and private transport sectors.

Whether it's a driver's cab, passenger door or any other application, we bring innovation, the highest quality standards, and engineering expertise to every project, and deliver ergonomic, safe and environmentally-friendly solutions.

Vehicle manufacturers and public transport companies around the world benefit from the superior design, reliability, quality and durability of our HMI Components and Systems used in trains, trams, metros and buses. EAO customers appreciate the comprehensive choice of standard products and the consistent global availability.

When it comes to intuitive and reliable HMI Components and Systems for the transport industry, EAO has been a market leader for decades. EAO offers customers vital added value in the planning, developing and manufacturing of both simple and complex HMI Components and Systems. With their intuitive markings, superb tactile feedback and functional LED illumination, the EAO Series 56 and 57 illuminated door opening pushbuttons are the industry standard and used by the world's leading transport companies.

EAO can adapt the products' features for the intended application, so that technology and user are in perfect harmony. This results in high quality, intuitive, user-friendly interfaces.

The Human Touch®

It is moments that matter. Behind each interaction lies a need, a story, an objective, a wish, and a goal. These are just as diverse as the requirements for the operation of machines. It is only our complete understanding of the requirements, the environmental demands, and the technical functionality of machines that allows us to develop innovative, intuitive, reliable, and safe products and systems.

EAO – Your Expert Partner for Human Machine Interfaces

Intuitive and reliable. *Under all conditions.*

Regardless of the conditions to which our HMI Components and Systems are exposed in public transportation, the focus of our products and solutions is always on intuitive operation, a long service life and reliability in use. Our innovation, quality and unique products represent our contribution to safe, environmentally friendly mobility.

Driver's cab

HMI Components and Solutions for driver's cabs.

Passenger access system

Intuitive switch actuators and indicators for passenger access systems.

Toilet facility

Toilet facilities with control panels and HMI Components.

Passenger transport infrastructure

HMI Components and Systems for individual solutions.



Ergonomics. *For control elements in driver's cabs.*



EAO works closely with experienced manufacturers and operators of rail vehicles to develop driver's cab control elements that meet both customer expectations and international standards and specifications.

The effectiveness of a driver's cab HMI System depends to a critical extent on the precision of the requirements analysis and the quality of the design. With decades of expertise, we master increasing levels of complexity and tackle the broad range of integration issues inherent in these control systems.

Our attractive designs, global service network and comprehensive research and development activities make EAO the world's leading partner for innovative, intuitive, ergonomic and reliable driver and passenger controls.

Ancillary driver and guard controls

EAO products are the outstanding solution for ancillary driver and guard controls. Train drivers and crew can use them for locking and unlocking doors, turning on lights, or operating communication systems. Our products can be fitted to any location within the train, wherever controls are needed.

Retrofitting

EAO's modular plug-and-play components and systems allow for simple and cost-effective retrofitting, making our products and solutions flexible and long-lasting.

EUDDplus

EAO is a partner to major global manufacturers and operators in the railway and vehicle industries. We are aware of, and meet all guidelines for the interoperability of entire fleets. EAO was involved in the EU "EUDDplus" (European Driver's Desk Advanced Concept Implementation) project. Here, we were providing an important research contribution towards the achievement of modern, cross-borders operability and interoperability in the trans-European rail network.

Safety. *For passenger access systems.*

EAO passenger door controls offer quick and easy vehicle access, whilst maintaining high levels of comfort, safety and security.

The large multicolour illuminated pushbuttons are easy to find, whilst EAO's sounders, speaker modules and message indicators convey important passenger information, or warnings.

EAO door openers are used in trains, trams, undergrounds, buses, ships, elevators and escalators. These components are established and used in their millions around the world, proving their reliability on a daily basis even in extreme climates.

Understanding requirements

Our passenger access systems are often the only point of interaction between passenger and vehicle. This makes it all the more important that the human factors are met with intuitive markings, tactile, acoustic and optical feedback, and reliable operation. We maintain close relationships and a lively exchange of ideas with associations for people with disabilities in order to meet their needs. We wish to help people enjoy a safe and comfortable journey, from the time they get on to the time they get off.

It is only our complete understanding of the human requirements, the environmental demands, and the technical functionality of vehicles and machinery that allows us to develop and manufacture innovative, intuitive, reliable, ergonomic, and safe HMI Components and Systems.



For a pleasant journey. *HMI for passenger comfort and convenience.*

When it comes to passenger comfort and convenience, EAO offers a comprehensive range of perfect HMI solutions which have established themselves as indispensable components in many modern rail vehicles.

Here, our HMI solutions meet the various different installation situations. EAO's HMI solutions primarily focus on the needs of customers and the requirements of passengers, and we always aim to optimally meet both.

Thus, rail personnel value the intuitive operation of our HMI Systems within the UIC control panels for indicating errors or controlling the air conditioning, lighting and energy supply. Key-insert switches in the entryways allow doors, steps and door-closing signals to be controlled.

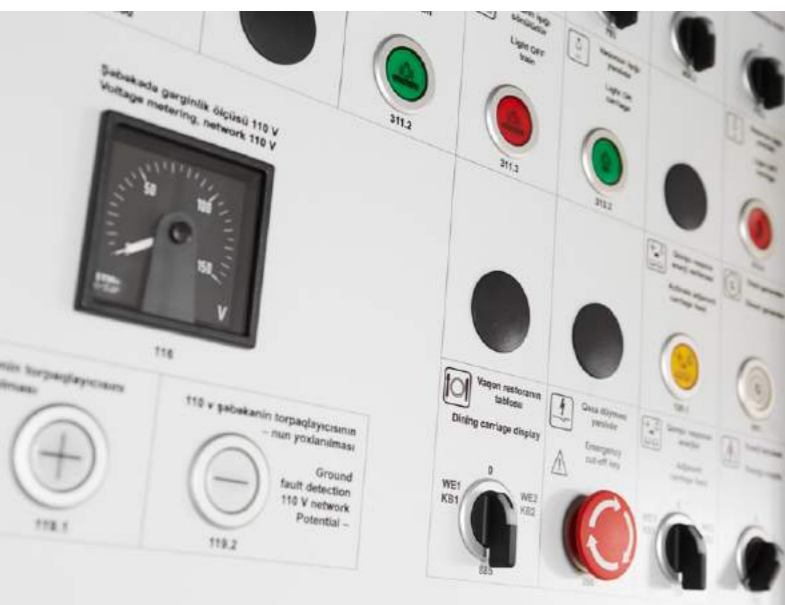


Applications for passenger convenience

EAO HMI seat operating systems for individually operating reading lights allow passengers to enjoy a comfortable journey. Using reliable EAO products, passengers can easily operate toilet flushes or the showers in sleeper carriages.

The EAO Passenger Interface improves the passenger experience, by providing phone charging, eliminating 'low battery anxiety' and enabling passengers to stay connected on their journeys.

Major international manufacturers in the transport industry put their faith in the tried-and-tested EAO HMI solutions, and draw on our global consulting and planning expertise.



User-friendly controls. For toilet facilities.



Modern EAO operation panels for toilet facilities are fitted to trains and coaches all over the world. These EAO solutions are intuitive and user-friendly, and offer passengers safe, secure and reliable operation.

The new generations of train must meet the TSI PRM technical specification. TSI PRM defines the specific requirements for people with restricted mobility in railway travel, which includes universal toilets.

The comprehensive EAO range includes the following:

- Complete toilet operation and door locking panels
- Switches with ring illumination, symbols and “Braille”
- Rugged secure door locking switches
- Warning signal – Multi-Tone Sound Modules (MTSM)
- Toilet engaged and toilet locked status indicators

Foresight. In passenger transport infrastructure.



HMI Components and Systems from EAO are also being used successfully around the world in passenger transport infrastructure at train stations, airports, bus stops, control centres and many other areas of application.

With our extensive range of individual products and solutions, we also meet the requirements for buildings and infrastructure used in the public and private transport sectors.

These include:

- Vandal-proof access systems and emergency-call terminals
- HMI Systems for monitoring emergency-call terminals LED information control systems at underground stations, bus stations, railway stations and at airports
- HMI Components and Systems for intuitive operation by employees and passengers

We focus on developing, easy to use, ergonomically designed products. Thorough testing of prototypes and production products ensures we always provide solutions of the highest quality, reliability and safety.

Our standard products can be individually customised in terms of materials, engraving or Braille embossing. We can easily produce customised options for individual customers.

Reliable. *For urban public transport.*



EAO's Human Machine Interfaces (HMI) play a major role in ensuring that large towns and cities do not become overwhelmed by the traffic on their streets.

For public transport, such as buses and trams, to represent an attractive option for travellers, it must be punctual, safe and easy to get on and off. This is why leading international suppliers of public transport vehicles put their trust in EAO's products and services not only when equipping driver's cabs, but also for on-board passenger information and access systems, with particular attention being paid to people with physical disabilities.

Entry and information systems

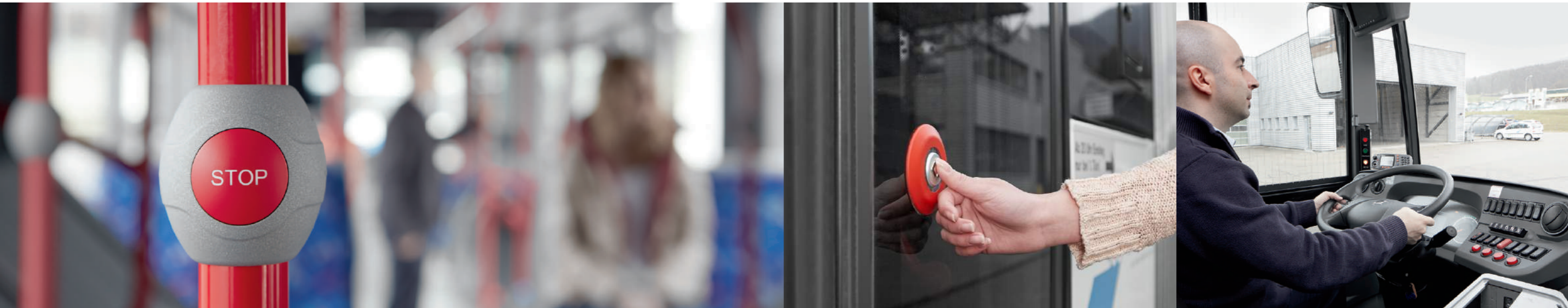
EAO has a comprehensive range of perfectly designed HMI solutions for passenger entry and information applications. This is why EAO door opening systems have become an indispensable feature on many of the world's most modern buses and trams.

With dual ring illumination, bright thermoplastic housing and an operating surface that only requires a defined touch, EAO pushbuttons help vehicle builders meet the demands of even the most stringent disabled passenger access regulations.

Intuitive – even for disabled passengers

Modern bus and tram design tends to favour vehicles with low floors or ramps which provide disabled passengers with easier access.

Passengers with impaired vision or hearing benefit from EAO's Series 57, which features dual illumination feedback rings, raised symbols and acoustic signals that make it best in its class for public transport systems.



Bus and tram drivers' control panels and door opening

EAO controls are suitable for flush mounting in square, rectangular or round panel cut-outs. They offer low back panel depth, a high level of protection and are tamper-proof.

Drivers benefit from

- excellent ergonomic design
- a very high degree of usability
- dimming illumination
- unique tactile feel
- unrivalled haptic feedback

On-board passenger information

On-board LED passenger information displays increase both the safety and value of buses and trams. EAO offers a high-quality range of keypads and keyboards that are ideally suited for programming display information and for easy operation by the driver.

In addition, the EAO stop request button makes a significant contribution towards ensuring that passengers board and disembark safely and comfortably. Especially in the case of people with prams, walking frames or wheelchairs, modern buses and trams today also feature stop request buttons that keep the doors open longer to make it easier for passengers to get on and off.

Individual expert advice

The versatile range of EAO products can be tailored to the specific designs, colour schemes and other demands of individual customers.

EAO is a partner who can be relied on to develop practical and efficient solutions that meet the unique needs of its customers in every respect.

Efficiency. *In retrofitting and modernising.*



Driver's cab before modernisation.



Driver's cab after modernisation in accordance with international standards.

EAO's core areas of expertise include the refurbishment, retrofitting and modernisation of HMI Components and Systems. Here, our specialists and our systems engineers work closely with major manufacturers, operators and subcontractors in the field of transport technology for trains, buses, trams and ships.

In the course of these collaborations, we analyse the specific installation requirements, examine the existing conditions, and implement the best-possible solution.

Effective refurbishment of a driver's cab depends upon an exacting design process that incorporates all technical, ergonomic and communication requirements and meets all international standards.

In accordance with international standards EAO train drivers' desk panels are designed according to UIC Leaflet 612-0 standards, which harmonises the layout and functional requirements of each control device.

Passenger access systems can be refurbished and upgraded using the latest Series 57 products. Our technical know-how ensures compliance with international regulations, including the new EN 14752, TSI PRM and ADA standards.

Additional modular control panels can be designed as drop-in upgrades for security and lighting controls, critical system displays, toilet controls, crew controls and guards panels.

Diversity and individuality. *In HMI Components.*

EAO develops and manufactures one of the world's largest ranges of industrial HMI products.

A variety of mounting depths, design and combination options make our products hugely versatile. But what makes every EAO component really stand out are the cutting-edge materials, innovative technologies, and complete user-friendliness. We also modify our standard components individually in accordance with our customers' needs.

Designers can simplify their search for the perfect equipment by analysing their exact application requirements and, based on their needs, determine the characteristics of the components needed.

Because EAO offers one of the most comprehensive ranges of products, it is easy for everyone to select the right fit, according to:

- Electrical ratings – the right specifications for the task
- Actuation preferences – the most appropriate switch type
- Physical configuration and mounting needs – style and placement
- Special requirements – illumination and symbols
- International and market approvals

HMI functions

In public transportation, EAO specialises in these functions:

- Pushbuttons
- Illuminated pushbuttons
- Lever switches
- Selector switches

- Door opening pushbuttons
- Indicators
- Warning indicators
- Multi-Tone Sound Modules (MTSMs)
- Key-insert switches
- Emergency-call buttons

HMI features

EAO's engineers analyse the application requirements of our customers. This ensures that our HMI Components always perform to the correct standard for:

- Front protection
- Switch rating
- Mounting cut-out
- Connection system
- Certification
- Design
- Ergonomics
- Materials

Value added services

EAO makes it simple for designers to find the perfect equipment by analysing customers' exact application requirements and making the following adaptations to suit their needs:

- Marking
- Illumination
- Enhanced mechanical design
- Enhanced electronic design
- Software
- Cables and connections
- Assembled products/kits



Innovative, intuitive and reliable. *The Series 57.*

With the market launch of Series 57 in 2012, EAO once again set the standard in public transportation.

The innovative Series 57 combines the latest technology with the ergonomics of appealing design, exceeding the requirements of this stringently regulated market thanks to its particularly large 74 mm operation area.

Combined with international certifications, compliance with relevant standards and directives, and with the optional finding tone, these modern actuators and indicators satisfy all application needs. These outstanding properties have enabled the versatile Series 57 to become an established feature of many passenger access systems and toilet facilities in public transportation.

Functions

- Door opening pushbuttons
- Indicators
- Call for aid pushbuttons
- Warning indicators

The high-quality plastic front bezels are available to match the Series 57's appealing design in green, red, blue, yellow, grey and black.

Alternatively, the front bezels are also available in anodised aluminium. The Series 57 also has a rear-side plug-in terminal and its connector cable complies with the EN 50306 standard.

Advantages

- First choice to fully comply with EN 14752
- User-friendly, extra-large, Ø 74 mm operating area
- Two unique, independently illuminated feedback rings
- Raised, illuminated symbols that conform to TSI PRM & ADA
- Robust, raised front ring prevents unintended activation
- Coherent look and feel of the entire Series 57
- Integrated finding tone for visually impaired persons
- High IP69K front protection
- Optional illumination functions
- High UV resistance
- Smart final mounting saves time and costs

Further information on the Series is available at www.eao.com/57



For maximum safety. In public transportation.



Door opening pushbuttons Series 57

Whether front-mounted on doors, flush rear-mounted on the sidewalls or glass-mounted (single or double side), the Series 57 door opening pushbutton range has a stylish passenger door control for all applications that is combined in a coherent look and feel across the product series.

User-friendly features include the extra-large Ø 74 mm operating area and two independently illuminated feedback rings that fully comply with EN 14752. The additional user benefits of the raised symbols (conform to TSI PRM & ADA) and the optional finding tone for visually impaired users make this unique “all-in-one” door opening pushbutton the best-in-class. Furthermore, its optical, tactile and acoustic feedback is unbeatable.

Advantages

- First choice to fully comply with EN 14752
- User-friendly, extra-large, Ø 74 mm operating area
- Two unique, independently illuminated feedback rings
- Raised symbols that conform to TSI PRM & ADA
- Integrated finding tone for visually impaired persons
- Smart final mounting saves time and costs

The front bezels and symbols are made of plastic, although some are also available in anodised aluminium.

Symbols available (examples)



Tri-Colour version Series 57

EAO, the expert partner for innovative, intuitive and reliable Human Machine Interfaces (HMIs) and the pioneer of illuminated pushbuttons, sets a new standard with door opening pushbuttons in public transport with its innovative and market leading Series 57.

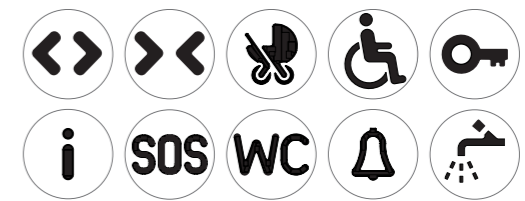
With the Tri-Colour Version of the Series 57 door opening pushbutton, a third colour can now be displayed in the outer feedback ring by the addition of two new LEDs.

These new indicators, along with the standard two feedback rings of individual illumination, make it possible to indicate additional warnings such as ‘door fault’ or a ‘door closing and opening’ by means of independent, flashing LEDs.

Advantages

- Tri-colour, individual LED illumination of the feedback rings
- Extra-large Ø 74 mm operating area
- Raised symbols conform to TSI PRM & ADA
- Consistent look & feel of Series 57 product family

Symbols available (examples)





Indicators

Series 57

The Series 57 indicators impress with their intuitive visual feedback and high quality. Their modular construction enables them to be easily mounted as status indicators in exterior and interior doors, passenger compartments and toilets within public transportation.

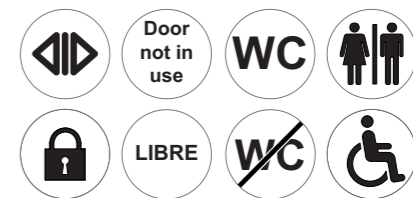
The modern design and extra-large illuminated surface ensure that symbols or text are clearly visible even from a distance. Flashing and dimming effects are also available.

Series 57 indicators are available with single or dual-colour illumination. Single-colour illumination is available in a selection of red, yellow, blue, white or green while the bi-colour version is available in combinations of red/yellow, red/green and blue/white.

Advantages

- Customer-specific symbols
- Extra-large, high-visibility illuminated surface
- Illumination in one or two colours
- Bright and homogenous illumination
- High IP69K front protection
- Optional flashing or dimming effects
- High UV resistance

Symbols available (examples)



Intuitive.

Safe in hazardous situations.



Call for aid pushbuttons

Series 57

The Series 57 emergency-call button with its raised bell symbol (conforming to TSI PRM & ADA) serves to activate emergency aid signaling systems in public transport, and also at emergency terminals.

The emergency-call button combines functionality and design. Two feedback rings provide additional visual feedback when the button is activated.

The robust, raised anodised aluminium front ring protects the button against damage and avoids accidental actuation. The front is protected to IP69K and makes the emergency-call button ideal for outdoor use or within toilet facilities. This button shares the same design and dimensions as other products of the Series 57 range.

The emergency-call button unites functionality and design, making it the perfect choice for all rail and bus vehicle manufacturers along with the transportation companies who run them.

Advantages

- Extra-large operating area for easy and safe use
- Robust, raised front bezel made of anodised aluminium prevents unintended activation
- Two individually controlled feedback rings
- High IP69K front protection
- Ideal for outdoor use

Symbols available



Warning indicators

Series 57

The warning indicator is designed for use in public transportation to make people aware of hazardous situations, for instance as a visual indicator when doors are about to automatically close. The front is protected according to IP69K against damage and has been specifically designed for outdoor use.

The warning indicator shares the same design and footprint as other products of the Series 57 range. The extra-large lens guarantees optimum visibility from all sides, even during strong direct sunlight. LED illumination is available in red or yellow.

Final assembly does not require any tools, which saves time and money. This is why this warning indicator is the perfect choice for all rail and bus vehicle manufacturers and the transportation companies who run them.

Advantages

- Extra-large illuminated surface
- Optimal visibility from all sides, even during strong direct sunlight
- High IP69K front protection
- Smart final mounting saves time and costs
- High UV resistance

Millions in use worldwide since 1996. *The Series 56.*



Over 20 years ago, EAO launched its intuitive and reliable Series 56 door opener, a pushbutton that revolutionised the public transport sector with its characteristic “click”, denoting the mechanical contact point.

The resounding success of Series 56 is due first and foremost to how highly its functions are valued by railway passengers and employees alike. This is thanks to the intuitive and reliable operation of the robust door opening pushbutton, indicators, individually programmable Multi-Tone Sound Modules, flashing warning lamps and unique lever switches. After its initial success in passenger access systems and toilet facilities on trains, the EAO door opener has also proven its value anywhere reliable access is needed as seen in trams, metros, buses, ships, elevators, escalators and emergency help points over the years.

Functions

- Door opening pushbuttons
- Indicators
- Multi-Tone Sound Modules
- Flashing warning beacons
- Lever switches

In addition to their very long mechanical and electrical service life, Series 56 door openers are hallmarked by their reliability, vast potential for customer-specific individualisation and a variety of mounting options – these products can be front, rear, or even glass mounted.

The high-quality plastic front bezel is available in black, red, orange, yellow, green, blue, dark grey and light grey – to match customers’ designs. Alternatively, these front bezels are also available in aluminium.

Advantages

- Unique tactile feedback
- Exceptional long-term reliability
- Wide product range
- Simple integration through mounting options
- Individually customisable

Further information on the Series is available at www.eao.com/56



25 Years
Series 56
1996 - 2021

Firmly established.
Intuitive and reliable.



Door opening pushbuttons Series 56

Firmly established and with millions in use worldwide, Series 56 door opening pushbuttons prove their reliability on a daily basis even in the most severe climatic conditions.

With their tactile, acoustic and optical feedback, and long error-free service life, these door opening pushbuttons with their timeless design represent one of EAO's most important HMI innovations to date.

The broad product range of the Series 56 door opening pushbuttons covers all user needs. Thanks to the wide selection of lenses, front bezels, connector cables and different mounting methods – with front, rear and glass mounting – this door opening pushbutton offers a diverse range of potential applications. The front bezels and symbols are available in both plastic and in anodised aluminium.

Advantages

- Unique tactile feedback
- Exceptional long-term reliability
- Wide product range
- Simple integration through mounting options
- Individually customisable
- Flush or raised lens
- Symbols are compliant with TSI PRM & ADA (aluminium version)
- Front bezels with braille
- Ring illumination with 8 green and 2 red LEDs (standard version)

Symbols available (examples)



Universal Switch Series 56

Ideal for transit buses and travel coaches – the Series 56 Universal Switch can always be located quickly, thanks to its LED illumination that is clearly visible at all times as well as its large actuation surface, range of colour options for the front bezel and laser engraved symbols. These features, combined with the unmistakable and distinctive click upon operation, ensure that the intuitive button offers an extraordinarily high level of user comfort.

A wide range of standard, ISO 7000 or customer-specific symbols can be lasered in black onto the grey anodised symbol inserts. This versatility, in combination with the range of colour options for the front bezel, allows an application-specific design to be produced quickly and easily. Lenses without symbols are also available.

Advantages

- Intuitive operation thanks to visual and tactile feedback
- Large actuation surface and various front bezel colours

- Low mounting depth (27 mm incl. M8 x 1 standard connector)
- Long, reliable service life (> 5 million cycles of operation)
- Standard, ISO 7000 or customer-specific laser Symbols

The pushbutton stands out at first glance thanks to its large actuation surface. The enabled state of the button is signalled by green lighting, which is easily visible even under adverse light conditions. The user receives multi-sensory feedback as soon as the button is pressed. This takes the form of the audible and tactile click that is typical for buttons in the Series 56 product family, as well as a clearly visible red LED in addition to the green illumination.

Symbols available (examples)





Indicators

Series 56

Series 56 indicators are usually found within the immediate vicinity of train doors to visual indication of their operational status. In passenger spaces, these intuitive indicators easily reveal whether toilet facilities are vacant or occupied.

A wide range of configuration options – from bright, homogeneous illumination in red, yellow, blue, white or green – combined with flush or raised, semi-spherical lenses can be generated. They enable symbols and texts of up to three lines to be displayed intuitively and reliably. The Series 56 indicators also demonstrate impressive flexibility by enabling both front and rear mounting.

Advantages

- Clearly visible, bright and homogeneous illumination
- Five illumination colours (red, yellow, blue, white or green)
- Various standard symbols
- Text with up to three lines
- Flush or raised, semi-spherical lenses
- Front or rear mounting

Symbols available (examples)



Safe.

Individual and intuitive.



Multi-Tone Sound Modules

Series 56

Multi-Tone Sound Modules (MTSMs) provide an audible warning sound in potentially dangerous situations. EAO even offers a version which can automatically gauge and adjust the sound output to suit the ambient conditions – for example, when an automatic train door closes.

By intelligently sensing the ambient noise level and self-adjusting the sounder's level, the appropriate volume output is set. This automatic control prevents excessive noise and simplifies the set up process. Furthermore, it can be custom-programmed to emit unique warning sounds and alerts for different situations.

The Multi-Tone Sound Module can be mounted on the front or rear, or optionally on glass.

Three MTSM versions are available with different numbers of possible tone sequences (3, 5 or 6 tone sequences). A free tone editor is available under www.eao.com/downloads for these versions.

Advantages

- Fixed or automatically adjusted volume output according to ambient noise
- Compact design
- Easy-to-customise tone sequences
- Standard tone sequences pre-programmed (e.g. as per TSI PRM)
- Maximum IP69K front protection



Lever switches

Series 56

The Series 56 lever switches are commonly found within toilet facilities on trains and are used to provide security by reliably locking the doors.

The robust construction of this large lever, which is made of natural anodised aluminium and has two switch positions (switching function: 0 – maintain) which ensure that it is both intuitive and reliable to use.

Advantages

- Robust lever
- Two switching positions
- Actuating force of 6 to 9 newtons
- Switching function: 0 – maintain
- Switching angle of 45°



Flashing warning beacons

Series 56

LED flashing warning beacons are a useful addition to the successful Series 56 range. They are designed to alert users to system malfunctions and closing doors in public buildings and transportation applications that include both trains and buses.

With its unique design and bright LEDs, these beacons offer unimpaired visibility from all sides and angles, even in strong sunlight situations. A wide selection of front bezels made of metal or plastic, also offered in different colours, enable a diverse range of combinations and options to design the indicator for the application at hand.

Advantages

- All-round visible LED flash (180°)
- Visibility ensured even in daylight
- Flashing frequency of 1 Hz (1 flash/sec)
- Diverse combination options

Versatile. Robust and reliable. *The Series 04.*

EAO's versatile Series 04 has proven its value in modern rail vehicles by fulfilling a variety of application and international requirements.

Thanks to their modern design, safe and ergonomically friendly operation, and pronounced tactile feedback, the Series 04 has become an established feature of driver's cabs in particular. The extensive range of Series 04 products offer square or round options that enable virtually flush front mounting styles.

Functions

- Illuminated pushbuttons
- Indicators
- Selector switches
- Key insert switches
- Lever switches
- Emergency stop switches

Each of these HMI functions can be designed precisely to specification for the given application. For instance, standardised or customised markings can enable intuitive operation – in the form of text or symbol engravings as found on the lens or text plate.

Front bezels made of black or silver plastic, as well as natural or black anodised aluminium, lend these actuators and indicators a design that is as modern as it is robust.

The switching elements also offer a choice of screw or plug-in terminals as well as tool-less mounting using the intuitive option of push-in terminals (PIT). Combined with international approvals and compliance with relevant standards and directives, these actuators and indicators cater to all the needs of users.

Advantages

- Versatile and reliable range of products
- Ideal for driver's cabs
- Modern and robust design
- Safe and ergonomically friendly in use
- Pronounced tactile feedback
- Customised and standardised markings
- International certifications and compliance with relevant standards and directives

Further information on the Series is available at www.eao.com/04



Firmly established. *Universal in use.*



Illuminated pushbuttons

Series 04

The modular and universal Series 04 illuminated pushbuttons are used in public transportation throughout the world.

These actuators enable unique, tactile feedback upon switching and allow for safe operation in any situation. This is why renowned manufacturers of rail vehicles all across the world trust the Series 04 illuminated pushbuttons as the reliable choice in HMI controls. New versions of the illuminated pushbutton that utilise a reduced actuation force of 3N in particular are ideal for anti-fatigue, safe switching in driver's cabs.

EAO's Series 04 rely on tried and tested, self-cleaning snap-action switching elements that switch safely and reliably even at operating temperatures

of -40°C to $+55^{\circ}\text{C}$. The almost flush front mounting of the round or square buttons with lenses offered in different colours, made of plastic or metal, lend each application a design that is as modern and long-lasting as it is robust (IP65).

Advantages

- Unique, tactile feedback
- Versions with reduced actuation force
- Modern, long-lasting and robust design
- A variety of combination options
- Large selection of text and symbol plates
- Operating temperature from -40°C to $+55^{\circ}\text{C}$
- Almost flush front mounting
- IP65 front protection



Indicators

Series 04

The modular and universal Series 04 indicators are used consistently throughout the world in public transportation applications. Series 04 indicators can be easily and individually marked with intuitive texts and symbols as compared to the illuminated pushbuttons – the protected text plates under the lens are simply marked.

Combined with vibrant LED illumination, the broad operating voltage range, and conformity with the EN 50155 and IEEE 1476 standards, Series 04 indicators are ideal for use in harsh conditions often found within public transportation applications.

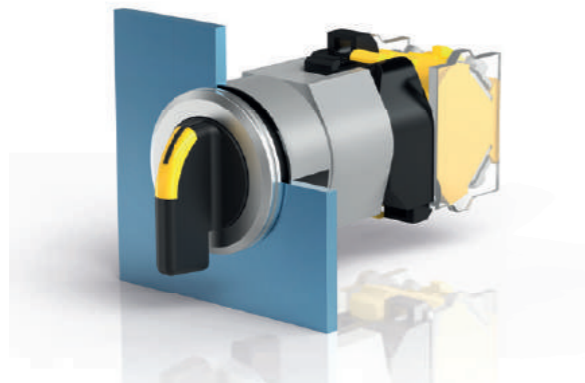
Whether the lenses are flush or raised, round or square, red, yellow, green, blue or simply transparent – these versatile indicators are an impressive asset in almost any application with their modern, long-lasting, robust design (IP65).

Advantages

- Modern, long-lasting and robust design
- Large number of combination options of LEDs, voltages and colours (including bi-colour version)
- Easy, individual marking with text or symbols
- Large selection of text and symbol plates
- Operating temperatures of -40°C to $+55^{\circ}\text{C}$
- Almost flush front mounting
- IP65 front protection

Robust.

Tactile and long-lasting.



Illuminated selector switches

Series 04

Thanks to the high IP65 protection, optional LED illumination, a modern design that complies with all ergonomic requirements and conforms to the standard DIN 5566-1, the Series 04 illuminated selector switches are ideal for versatile rail vehicle applications.

The homogeneous illumination in different colours provides a clear indication of changes in switch position, regardless of the lighting conditions. Safe, intuitive, and efficient operation is a result of the sleek, ergonomic design that also helps reduce risk of injury thanks to the smooth, rounded edges of the actuator handle.

Advantages

- Bright, single or bi-colour LED illumination
- Modern design with rounded edges (conforms to DIN 5566-1)
- High IP65 front protection
- Variety of combinations of maintained and momentary action
- Almost flush front mounting
- Short and long levers
- Long service life

The actuators are designed for at least 1.25 million switching cycles, offer two or three switching positions and a flexible combination of maintained and momentary action. These selector switches ensure safe and reliable function, even at temperatures of -40°C to $+55^{\circ}\text{C}$.



Key insert switches

Series 04

EAO key insert switches are used globally in the field of public transport. They prevent the unauthorised activation or deactivation of restricted systems and unauthorised access to vehicle compartments or toilet facilities.

- Suitable for indoor or outdoor use (IP67)
- Customer-specific key insert profiles
- Usable at up to -40°C
- Various switch positions
- Very long service life of mechanical and electrical components
- Variety of combinations of maintained and momentary action



Lever switches

Series 04

Lever switches are robust and versatile. They are available with up to five switch positions and a variety of maintained and momentary action. They are used worldwide, predominantly in the cockpits of road and rail vehicles, and on the bridge controls of ships.

- Very robust design
- Visible switch positions
- Large selection of levers
- Very long service life of mechanical and electrical components
- Also suitable for switching larger currents
- Variety of configuration possibilities due to modular construction

HMI functions and features. At a glance.

	Series							
	04	14	22	56	57	61	82	84
Application								
Driver's cabs	■	■	■			■		■
Passenger access system	■			■	■			
Toilet facility	■			■	■			
Urban public transport		■		■	■	■	■	■
Transport infrastructure				■	■		■	■
Function								
Pushbutton	■	■	■	■	■	■	■	■
Illuminated pushbutton	■	■	■	■	■	■	■	■
Indicator	■	■	■	■	■	■	■	■
Warning indicator				■	■			
Call for aid pushbutton				■	■			
Selector switch	■	■				■		
Illuminated selector switch	■							
Keylock switch	■	■	■			■		
Key insert switch	■							
Emergency-stop switch (E-Stop)	■					■		■
Buzzer	■	■				■		
Multi-Tone Sound Module (MTSM)				■				
Lever switch	■			■				
Mushroom-head pushbutton	■	■	■			■		■
Mounting cut-out								
16mm						■	■	
19mm							■	
22.5mm	■	■				■	■	■
30.5mm	■	■						■
43mm				■	■			
Square/rectangular	■		■			■		
Switch rating								
42 VAC/100 mA		■				■		■
220 VAC/100 mA							■	
240 VAC/500 mA							■	
250 VAC/5 A		■				■		
400 VAC/10 A			■					
500 VAC/10 A	■							
24 VDC/200 mA				■	■			
110 VDC/200 mA				■	■			
Terminal								
Soldering terminal		■				■		
Solder/Plug-in terminal		■				■	■	■
Plug-in terminal	■		■					
Screw terminal	■		■			■	■	
PCB								■
PCB plug-in base available		■				■		
Push-in terminal (PIT)	■							
Cable				■	■			■
Front protection								
IP40								■
IP65	■		■			■	■	■
IP67	■	■		■			■	■
IP68 (with protective cap)		■				■		■
IP69K					■	■		

Charge. Connect. Communicate. *EAO Passenger Interface.*



The EAO Passenger Interface improves the passenger experience, by providing phone charging, eliminating 'low battery anxiety' and enabling passengers to stay connected on their journeys.

The EAO Passenger Interface improves the passenger experience by providing phone charging, eliminating 'low battery anxiety' and enabling passengers to stay connected on their journeys. The innovative passenger interface utilises a novel multi-coil inductive charger certified to the global Qi standard for iOS and Android that can charge any enabled phone wherever its charging interface is located – just by placing it in the SliderFLEX seatback holder, or on the table charging pad. Wireless charging eliminates the need for cables and improves the reliability of the system, and the optional USB socket caters for older phones.

Key features

- Seatback holster, or embedded table top charging unit
- Qi Inductive Technology
- Compatible with all modern phones through USB socket
- Can be retrofitted to seats and tables during refurbishment
- iBeacon smart positioning for App integration*
- Rugged, reliable design for rail applications

* Subject to app development & cloud based service fees for the operator

Benefits to the passenger

- Charge phone without inconvenience of carrying plugs and cables
- Opportunistic charging to avoid 'low battery anxiety'
- Access to additional on-board services during journey
- Profit from tailored promotional offers during and after the journey

The Passenger Interface will broaden the role of public transport operators towards digital service technology providers to deliver additional value for their customers.

Benefits to the train operator

- Clear enhancement to the passenger experience and the operator's image
- Can be retrofitted during refurbishment or as a separate upgrade
- The SliderFLEX and holster accept most modern smart phones
- Can be branded with the service operator's or sponsor's logo
- Additional revenues through tailored passenger services

Further information is available at
www.eao.com/passenger-interface



Experts. *In mixed technology solutions.*



EAO develops impressive, customised HMI Systems that feature innovative technology, intuitive operation and reliability.

As experts in various mixed technology solutions, we provide our customers with expertise – from the initial idea right through to the manufacturing stage – and generate real added value on their behalf.

System solutions

When manufacturing HMI Systems (HMIS) that meet the entire spectrum of market requirements, quality is key. Thanks to EAO's high-quality product range, and to the variety and flexibility of our components and systems, we have in place the ideal requirements for an effective HMIS. When it comes to cockpits, control panels and modules, control devices for robot systems, and complex control systems, we have the right components and the necessary expertise to combine these and create perfect solutions.

Experts in mixed technology solutions

Our engineering services also include bringing together customer-specific components and touchscreens that are not part of the EAO product range. As experts in mixed technology HMI solutions, we can provide our customers with our comprehensive expertise – from the initial idea right through to the manufacturing stage – and generate real added value on their behalf.

Savings in cost and time

Global experience in supply chains, our expertise in process optimisation and the EAO risk management system guarantee accurate planning and a reduction in the number of interfaces. EAO's customers thereby

benefit from considerable savings in cost and time. Our customers around the world also appreciate our global expertise when it comes to functional and ergonomic user requirements as well as market-specific and country-specific standards, certifications and approvals.

Global service

We use our globally active planning and production centres to provide advice and support during all project phases. This is all a fundamental part of our system of total quality management. The EAO network of sales companies and production sites in Europe, North America and Asia provides our customers with access to top-quality consultation, design and logistics services. From planning and prototyping through to assembly, we offer all the services necessary for the production of process-specific systems solutions.

Sustainability as standard

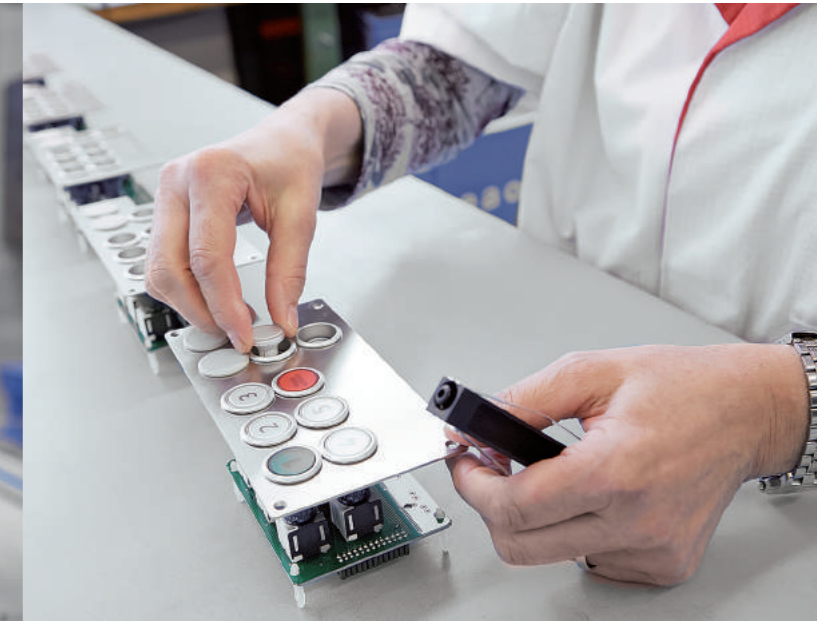
Sustainability is of course also a part of our consultation service – as are warehousing, project documentation, on-site training, and other services such as refurbishment.

Example HMI System Innovation

With its extremely flexible and modular design, the HMIS Multi-Legend Alarm Indicator fulfils a broad range of application needs. The panel size and the symbols are customisable. Different illumination colours are available. The flexible number and arrangement of the symbols as well as the ultra-thin mounting depth of less than 8mm thickness ideally fit to driver desk and control cabinets, as well as in other railway application where the space envelope for the status indicators is limited.

Reliable assembly. Short delivery times.

Certified. Your expert and partner.



Thanks to our international production sites and our global delivery and support centres, we offer you efficient, sustainable logistics and can optimise your supply chain.

With four value-creating partners in Europe, Asia and North America, as well as other strong partnerships around the world, we are able to offer the following:

- Qualified vendors worldwide
- Consistent multi-location processes
- Integrated quality measures throughout the supply chain

To us, speedy assembly, short delivery times and secure processing are all part of good customer service. And so too is comprehensive production expertise, as exemplified by the following:

- PCB design
- SMT placement, assembly and inspection
- Cable and connector assembly

EAO also has long-standing experience in building HMI Components, which allows us to offer our customers truly expert consultation in the areas of machining, surface treatments, sheet metal forming, injection moulding, marking, PCB placement, and the integration of complete HMI Solutions.

Our adherence to international standards in combination with comprehensive product testing has made EAO into an established and reliable partner when it comes to planning, developing and implementing your optimal HMI solutions.

We use our in-house laboratories to subject our HMI products to various batteries of tests and assessments under the most realistic conditions. EAO utilises a comprehensive quality management system which covers all business areas.

We are certified in accordance with the following standards:

- Quality Management System DIN EN ISO 9001
- Quality Management System ISO/TS 22163 (IRIS)
- Quality Management System IATF 16949 (Automotive)
- Environment Management System ISO 14001
- Industry-specific standards and regulations

Reliability. Continuity. Durability

In order to meet customers' demands in terms of reliability, continuity and durability, our products and systems are subjected to permanent quality monitoring. Among other things, this includes:

- Tests with special software (e.g. LAB View)
- Use of cutting-edge environmental test chambers
- Checking of adherence to different degrees of protection
- Testing the durability of individual components
- Optical and X-ray analyses
- Finite element method

Our products possess the key international approvals, and meet all standards and guidelines such as: KBA, IRIS, TSI PRM, IATF, CE, UKCA, RoHS, REACH, ENEC, CB, UL/UR, ISO, CSA, VDE, CCC, CQC, EAC, DNV and many more.



EAO worldwide. *Your nearest centre of excellence.*

Our close proximity to our customers and ability to provide a comprehensive range of services is fundamental to our success and at the core of our corporate policy.

EAO's production sites in Switzerland, Germany, North America and China combine volume production, development, research, and logistics. In addition to these centres of competence, EAO has 10 sales companies around the world at its disposal.

Thanks to this comprehensive network and more than 50 distribution companies in the major industrialised countries, EAO is represented wherever interactions between humans and machines play key roles.

Thanks to our international production sites and our global delivery and support centres, we offer you efficient, sustainable logistics and can optimise your supply chain.



Manufacturing companies/sales companies: ■ Switzerland, EAO Headquarters. ■ China, France, Germany, Hong Kong, Italy, Japan, Netherlands, North America, Switzerland, United Kingdom. **Distributors:** ■ Argentina, Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Chile, Croatia, Czech Republic, Denmark, Egypt, Finland, Great Britain, Greece, Iceland, India, Iran, Ireland, Israel, Italy, Korea, Latvia, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, North America, Norway, Poland, Portugal, Romania, Russia, Saudi Arabia, Singapore, Slovenia, Spain, Sri Lanka, South Africa, Sweden, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom.

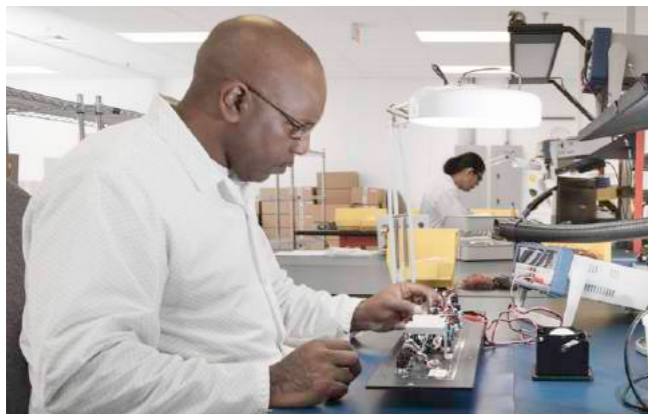
EAO manufacturing companies.

With four value-adding partners in Europe, Asia and North America, we are able to offer the following:

- Qualified vendors worldwide
- Consistent multi-location processes
- Integrated quality measures throughout the supply chain

To us, speedy assembly, short delivery times, and secure processing are all part of good customer service – as well as comprehensive production expertise.

Our products possess the key international approvals, and meet all standards and guidelines such as: KBA, IRIS, TSI PRM, UIC, CE, RoHS, REACH, ENEC, CB, UL/UR, ISO, CSA, VDE, CCC, CQC, EAC, DNV and many more.



Switzerland
EAO AG
4600 Olten, Switzerland

Overall surface area in m ²	15000
Production and storage space in m ²	11000
Employees	320
Corporate certifications	ISO 9001 ISO 14001 ISO/TS 22163 (IRIS)

Awards

Core capabilities

- Manufacturing of complete HMI control units and HMI Systems
- Customer-specific HMI solutions
- Complex front plate mounting
- Internal product validation and approval
- Various marking technologies
- Complete mounting sets
- Cable and plug mounting
- Specialised packaging
- 3D prototyping



North America
EAO Corporation
Shelton, Connecticut, USA

Overall surface area in m ²	2000
Production and storage space in m ²	1200
Employees	30
Corporate certifications	ISO 9001

Awards

- Frost and Sullivan ML100 recipient
- Industrial design, user experience, ergonomics
- Complete customer specific HMI Systems
- Production and supply chain management
 - Complex front plate mounting
 - Marking technologies
 - Complete system mounting set and kits
 - Cable and harness
- 3D prototyping
- Quality assurance and testing with LabVIEW
- Support of Buy America programs



China
EAO (Guangzhou) Ltd.
Guangzhou, PRC, China

Overall surface area in m ²	2000
Production and storage space in m ²	1300
Employees	65
Corporate certifications	ISO 9001

Awards

- Manufacturing of complete HMI control units
- Panel production
- Various marking technologies
- Complete mounting sets
- Cable and plug mounting
- Specialised packaging



Germany
EAO Automotive GmbH & Co. KG
08209 Auerbach, Germany

Overall surface area in m ²	3000
Production and storage space in m ²	2500
Employees	110
Corporate certifications	IATF 16949 ISO 14001

Awards

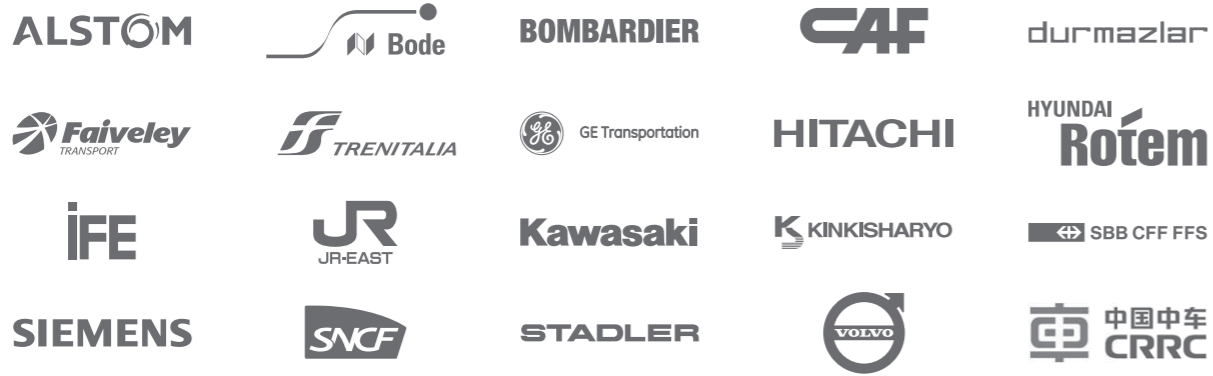
- Manufacturing of complete HMI control units and HMI Systems
- Complex ergonomic interfaces
- Software and interface design (LIN, CAN)
- Internal product validation and approval
- Production and supply chain management (from individual units to mass production)
- 3D prototyping
- Cable and plug mounting

Trust. We impress globally.



With fascination and in close cooperation with our customers and business partners, we develop innovative, intuitive and reliable HMI solutions to ensure highest customer satisfaction – from the initial idea through to the implementation and beyond.

Customers around the world place their trust in our comprehensive and long-standing experience. The results of our work are reflected in our impressive list of references. This is ultimately the best proof of our market expertise, from which you too can benefit.



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Safety instructions

All our products are to be used for the designated applications only. Maintenance, repair and replacement of our components and systems must be carried out by authorised and trained personnel.

General conditions of sale and delivery

We refer to the currently valid General conditions of sale and delivery which can be obtained from us. For further information about EAO's product range either contact your local sales office, distributor, or alternatively visit our website: www.eao.com

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