EAO HMI Systems
for railway industry.

www.eao.com
Expressing the immediate moment of interaction and making it innovative, intuitive and reliable is our task, our credo, and at the same time our fascination. The Human Touch*. Our passion, since 1947.
EAO develops impressive, customised HMI Systems that feature innovative technology, intuitive operation and reliable functions. EAO HMI Systems are of an outstanding quality in order to meet any requirement. Our engineering services also include the combining of customer-specific components outside of EAO’s product range. As an expert in mixed-technology solutions, we create optimal solutions for our customers saving them both time and money. Here, we have global supply chain experience at our disposal, and can draw on our expertise in process optimisation and EAO’s risk management system.

We meet not only every possible functional and ergonomic end user requirement, but also all market- and country-specific standards. We also possess all the necessary certifications and approvals.

Our HMI solutions offer the lowest total cost of ownership. EAO customers benefit from extensive savings in terms of money and time, as well as extremely long-term availability of our products and systems.

As a successful company with production sites around the world, EAO is actively committed to the effective implementation of a sustainable environmental policy. Our ISO 14001 certification for environmentally friendly management is something we are committed to and passionate about.

Your benefits as an EAO customer:
• EAO is your HMI expert – including mixed-technology solutions
• Efficient system solutions – tailored to your needs
• You save time and money – thanks to reduced interfaces
• Global service – around the world
• Sustainability – an integral part of our consultation service

Since 1947, our product innovation has been based on a thorough understanding of the end users and on our fascination with making interactions between humans and machines possible.
5 x 360 degrees.  
Thorough and complete project management.

We provide you with what you need: innovative, intuitive and reliable HMI System solutions, with qualified services through to the end of a product’s life cycle – and beyond.

As an expert partner, we offer you effective and efficient planning and design. Our global network of qualified suppliers in combination with our vast materials expertise results in optimised purchasing, production and logistics. Based on our comprehensive technical knowledge, we reduce unnecessary interfaces and guarantee precise project implementation. This ultimately enables the end-user to work intuitively. Cost-effective project management is supported via long-term service and the documenting of all technically and commercially relevant and necessary information.

EAO project management – holistic systems thinking

PROJECT MANAGEMENT

Phase 1  
Initialisation  
- Customer request  
- Analyse customer requirements  
- Risk and potential assessment  
- Start phase 2

Phase 2  
Pre-study and concept  
- Official project kick-off  
- Pilot study  
- Quotation for product and project  
- Start phase 3

Phase 3  
Realisation  
- FMEA  
- Development of prototype  
- Release for prototype  
- Start phase 4

Phase 4  
Prototype  
- Supply of tools and material  
- Produce prototypes  
- Release testing and design freeze  
- Start phase 5

Phase 5  
Zero Series and Series manufacturing  
- Supply of material  
- Produce and release zero Series  
- Lessons learned  
- End of project

Series production  
Delivery of Series products  
- Product ramp-up  
- Product ramp-down  
- Obsolescence management
Target-focused.
With commitment and efficiency.

HMI design and ergonomics

The starting point for optimal HMI solutions is a thorough understanding of best design practices, ergonomics and manufacturing standards.

- HMI System design and layout that is functional and intuitive
- Ability to match your overall system appearance – colour, graphics, etc.
- Knowledge of safety, ergonomic, industry and international standards

Software and interface design

Modern HMI solutions have embedded interfaces that link them with the larger system through software-controlled communication connections.

- CAN-Bus, CANopen, CAN-J1939, ProfiBus, InterBus, DeviceNet, ASi-Bus
- USB, Ethernet, RS-232, RS-485
- GUI touchscreen integration

Manufacturing and HMI expertise

As a worldwide manufacturer of HMI Components, our expertise in prototyping, tooling, plastics moulding, plating, electrical design, automation and precision-parts assembly is unsurpassed.

To develop innovative, application-oriented solutions that add significant value to end products, we offer our customers the appropriate expertise:

- Expert engineers, designers and toolmakers
- High-quality and reliable HMI Components
- Lean production knowledge
- Technology review and obsolescence management
- Conformance with CE, UL, CUL, VDE, RoHS, WEEE and other standards
- Environmental Management System ISO 14001

We ensure that your HMI solution meets all the criteria for your sector.

The interaction is our task and our objective.

We offer you the full spectrum of HMI services.

Beyond advising the efficient implementation of your projects – our commitment, expertise, experience and global network afford you impressive competitive advantages.

Production and supply chain

EAO supports you in taking advantage of local production while strengthening your global supply chain.

Our four global production companies and planning centers in Europe, Asia and North America ensure the planning and production of HMI products to ISO 9001 and other international standards.

- Consistent processes at all locations, with integrated supply chain quality measures
- PCB design and manufacturing
- SMT placement, assembly and inspection
- Cable crimping, cutting, harnessing and final assembly

From the initial processing through to the final integration of complete HMI solutions.

Mechanical and electrical system design

Once specifications have been approved, including components, panel layout and integration, they form the basis for mechanical and electrical system design.

EAO works closely with you to prepare detailed drawings, parts lists, circuit schematics and assembly instructions. Production schedules are agreed upon before manufacturing commences. EAO helps you cut development times using rapid prototyping techniques for plastic components and PCBs.

- 3D CAD/CAM/CAE (Solid Edge, AutoCAD, Pro / ENGINEER and SolidWorks)
- PCB design and simulation software (P-CAD, Altium)
- Gerber file generation for PCB manufacturing
- Rapid prototyping (3D Printing)

Thanks to our optimised production-sequence planning, you will get your product to market faster.

Quality assurance and testing

EAO has a dynamic total quality management system linked to all areas of our business.

Our products and systems undergo rigorous testing to assure reliability, repeatability and a long service life.

- Laboratory tests with special software (e.g. LAB View)
- Environmental test chambers (temperature and humidity)
- Checking of compliance to different degrees of protection
- Testing the durability of individual components
- Optical and X-ray analyses
- Final inspection on all systems

EAO supports you in testing the durability of individual components and other international standards.

We are certified and managed to the standards governing the markets we serve.

From the initial processing through to the final integration of complete HMI solutions.

We ensure that your HMI system is functional and intuitive, with integrated supply chain quality measures.

We offer you the full spectrum of HMI services.

We ensure that your HMI solution meets all the criteria for your sector.
Intuitive and reliable.

In every situation.

Our HMI solutions are as intuitive and reliable as expected within the transportation industry. EAO develops and produces high-quality HMI Systems for the public and private transport sectors. These enable safe and error-free communication at all times between the transport vehicle, driver, staff and passengers.

Driver’s cab
HMI solutions for driver’s cabs.

Passenger access
Innovative HMI solutions for passenger access systems.

Toilet facility
Reliable HMI solutions for toilet facilities.

Passenger convenience
Comfortable HMI solutions for passenger convenience.
Leaders in the world of driver’s cabs.  

**EAO HMI Systems.**

Driver’s cabs are the heart of HMI Systems within the transport industry. This is where all the threads for safely and reliably transporting passengers come together.

EAO customers put their trust in the global market leader for driver’s desk control elements. Design, surface finish, integration and wiring – EAO works together with you to establish and realise the optimal solution, including mixed-technology solutions.

The EAO Series 04 has been specially developed for the demands and challenges faced by driver’s cabs in the transport industry. With its comprehensive range of accessories, the series meets all requirements when it comes to creating innovative, intuitive and reliable driver’s cabs, and of course also fulfils all UIC 612 guidelines.

EAO also integrates third-party products and customer-specific components outside the EAO product range to provide customers with an optimal and uniform overall solution. From concept through production, we bring our comprehensive expertise to the project and thus generate great value for our customers with both competitive and cost advantages.

EAO possesses all globally required certifications and approvals and complies with legally applicable standards for the rail industry.
Safe and fast.
**HMI Systems for passenger access.**

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

The EAO Series 56 and 57 meet TSI PRM & ADA standard and EN 14752 regulations, and fulfill every required function when it comes to passenger access. Whether it’s illuminated pushbuttons, indicators, signalling devices, Multi-Tone Sound Modules (MTSM), or key-insert switches – EAO offers systems for all passenger access requirements. Integrated system solutions combine the different HMI functions for passenger access and minimize the needed time for assembly and wiring. Our technical know-how ensures compliance with international regulations.

Our components and 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 enduring, error-free functionality.

**We also make it possible for people with disabilities to travel safely and conveniently, from boarding to disembarking.**
Intuitive and user-friendly. 
HMI Systems for toilet facilities.

Modern EAO operation panels for toilet facilities are used in thousands of trains and coaches all over the world. These solutions from EAO are intuitive to use and stand out thanks to their user-friendliness and absolute reliability.

New generations of trains must comply with the technical specifications TSI PRM. This defines the special requirements for people with impaired mobility in rail transport – including the use of universal toilets.

EAO’s Series 56 and 57 meet all the requirements of TSI PRM & ADA and EN 14752, and thereby offer complete operating and door interlocking systems for toilet facilities in passenger transportation systems.

Special accessory components with specific requirements, such as SOS buttons, are as much an integral part of the comprehensive EAO offering as indicator systems to indicate the different statuses of the toilets.

Attractive design, high quality, long service life, and globally accepted marking techniques that can include customer-supplied symbols – EAO offers HMI Systems for all requirements.
For a pleasant journey.

HMI Systems for passenger convenience.

When it comes to passenger 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

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.

Major international manufacturers in the transport industry put their faith in the tried-and-tested EAO HMI Systems, and draw on our global consulting and planning expertise.
Efficiency.  
*In retrofitting and modernising.*

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 612 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 & 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.
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.
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: IRIS, TSI PRM, UIC, CE, RoHS, ENEC, CB, UL/UR, ISO, CSA, VDE, SEV, CCC, GHOST, Germanischer Lloyd and many more.

---

### Switzerland
EAO AG
4600 Olten, Switzerland

- Overall surface area in m²: 15,000
- Production and storage space in m²: 11,000
- Employees: 320
- Corporate certifications: ISO 9001, ISO 14001, IRIS Rev. 2
- Awards: 2013 Frost and Sullivan ML100 recipient
- 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 m²: 2,000
- Production and storage space in m²: 1,200
- Employees: 25
- Corporate certifications: ISO 9001
- Awards: 2013 Frost and Sullivan ML100 recipient
- Core capabilities:
  - Integrated HMI design
  - Complex front plate mounting
  - Various marking technologies
  - Complete mounting sets
  - Cable and plug mounting
  - Specialised packaging

---

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

- Overall surface area in m²: 2,000
- Production and storage space in m²: 1,300
- Employees: 45
- Corporate certifications: ISO 9001
- Awards: Manufacturing and inspection processes are certified in accordance with ISO 9001
- Core capabilities:
  - 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 m²: 3,000
- Production and storage space in m²: 2,500
- Employees: 120
- Corporate certifications: ISO / TS 16949, ISO 14001
- Awards: Manufacturing and inspection processes are certified in accordance with ISO 9001
- Core capabilities:
  - 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
At EAO, quality is a case not only of our individual products but also the entire value-creation process. Our certified quality management system ensures that our customers can rely on our products and services.

Automating components and production processes
With decades of experience as a global provider, we have the knowledge and products to satisfy our customers’ requirements and quality expectations.

CAD and rapid prototyping
EAO works with you to prepare detailed drawings, circuit schematics, production processes, inspection plans and assembly instructions. We help you significantly reduce development times with the aid of rapid prototyping techniques for your components and PCBs.

Software and bus system design
EAO has extensive experience with on-board microcontrollers. Bus systems are integrated in close collaboration with our customers and industry requirements.

Haptic and tactile design
We use special software for tests and material analysis in order to ensure the optimum tactile feedback characteristics for our HMI Components.
Engraving and marking
EAO lenses, text plates and film inserts can be individually marked with text, symbols or pictograms as required. Customers can choose between engraved, printed or laser markings.

Application-specific testing
EAO analyses technical requirements and operating environments, as well as ergonomic and commercial demands, to ensure that users and technologies work in complete harmony.

Packing and assembly
EAO offers a comprehensive range of cables and connectors as well as connector mating halves. Customers can select the cable type, cable length, connector type and pin assignment to suit their needs.

Electrical and mechanical life-cycle testing
In order to meet customers’ demands in terms of reliability, continuity and durability, our products and systems are subject to constant quality monitoring using service life testing, optical and x-ray analysis, the finite element method, and more.

Product testing and simulation
Using in-house laboratories, environmental chambers, and various methods of analysis, EAO’s products are exposed to very harsh conditions and tailored for maximum service life even in challenging environments.

Surface treatments
Our well-founded knowledge of surface treatment for sub-assemblies enables us to provide our customers with expert advice with respect to the characteristics of a huge variety of procedures.

Product testing and simulation
Using in-house laboratories, environmental chambers, and various methods of analysis, EAO’s products are exposed to very harsh conditions and tailored for maximum service life even in challenging environments.

Packing and assembly
EAO offers a comprehensive range of cables and connectors as well as connector mating halves. Customers can select the cable type, cable length, connector type and pin assignment to suit their needs.

Electrical and mechanical life-cycle testing
In order to meet customers’ demands in terms of reliability, continuity and durability, our products and systems are subject to constant quality monitoring using service life testing, optical and x-ray analysis, the finite element method, and more.
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.
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

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

EAO (Hong Kong)

EAO (Asia Pacific) 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

Germany, Austria, Czech Republic,
Poland, Slovakia

EAO GmbH
Langenberger Straße 570
DE-45277 Essen
Telephone +49 201 8587 0
sales.ede@eao.com

EAO Italia S.r.l.
Centro Direzionale Summit – Palazzo D1
Via Brescia 28
IT-20063 Cernusco sul Naviglio (MI)
Telephone +39 029 247 0722
sales.eit@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 D1
Via Brescia 28
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

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

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

www.eao.com