

ebs group

# Engineering for Embedded-, Safety-, and Real-time Systems

WE TAKE RESPONSIBILITY – FROM  
THE IDEA TO A FINISHED SYSTEM.

[ebs-group.io/  
engineering](https://ebs-group.io/engineering)



# Engineering Services at a Glance.

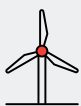
ebs group stands for excellent engineering in safety-critical and high-availability embedded systems. Our interdisciplinary team combines system understanding with technological depth– for your product development from idea to approval.

- **Embedded Software Development**  
Development of firmware, BSPs, drivers, and applications for Linux and RTOS. Specialized in ARM and RISC-V architectures.
- **FPGA-Design and Verification**  
Development of digital circuits (VHDL/Verilog), IP integration, high-level synthesis, test bench design, and simulation.
- **Safety & Real-time Engineering**  
Expertise in EN/IEC 61400, EN 60601, IEC 61508, and EN/IEC 15408. Design and implementation of real-time capable, standards-compliant systems.
- **Qualification, verification, validation**  
We prepare the test procedure precisely and supervise implementation in accredited measurement laboratories for the environmental qualification of hardware in the areas of EMC, vibration, shock, and heat.
- **System and Hardware Development**  
Circuit design, PCB layout, EMC-compliant development, integration of complex SoCs and FPGAs.
- **Test & Toolchain Engineering**  
Setting up CI/CD environments, automated testing, toolchain optimization for reproducible builds and rapid iterations.
- **Obsolescence Management**  
Ensuring the availability of assemblies and components throughout the entire product life cycle.
- **Configuration Management**  
We take care of setting up and operating configuration management. This allows you to maintain an overview of software, hardware, and documents and ensures the efficient development of complex systems.

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## Engineering for markets with responsibility.

Engineering for markets with responsibilityTechnology with intelligence and responsibility. At ebs group, your requirements are our focus – right from the start. From the very first conversation, you will sense that we understand your project, your goals, and your technology. As specialists in embedded systems, we delve deep into your systems and take responsibility – from conception to series production. Our practical solutions support you in every phase of your project: structured, reliable, and tailored precisely to your requirements. In addition to excellent technology, we deliver clarity in communication and efficiency in implementation – so that your development reaches its goal safely.



Renewable energies



Laboratory and medical technology



Industrial solutions and machinery



Defense industry



Semiconductor industry



Aerospace

## RESPONSIBILITY

# Managing Complexity. Realizing Innovation.

**We take responsibility - from the idea to the finished system.**

We support the realization of complex technical projects with comprehensive development expertise and quality testing. At ebs group, you will meet experts with many years of professional experience. You can see the quality of our work for yourself from the very first meeting with us. What we promise, we also realize. We assume system responsibility for development projects right from the start. We support you with practical concepts both in project planning and in all phases of implementation. We work on the basis of sound expertise in precise coordination with your requirements.

We give you more than just a technical service. In addition to our IT expertise, our particular strength lies in developing solutions through efficient and clear communication.

### ↓ Features

**15+**  
Jahre



Experience in  
embedded  
projects

Combination  
of hardware,  
software, and  
system thinking



Faster project  
start thanks to  
well-coordina-  
ted teams

**EN  
ISO**

High standards  
of competence



Partnership-  
based thinking  
& transparent  
communication



High quality  
standards

### ↓ Products, Projects, and Services.

#### PRODUCTS

**ecore** **enhance** **egate** **egate** **evolve**  
SOFTWARE REFERENCE ARCHITECTURE DC-LINK ENERGY BACKUP SOLUTION BATTERY MANAGEMENT SYSTEM PROTOCOL CONVERTER LV BATTERY SYSTEM

#### CLIENT

#### PROJECTS / SERVICES

DEVELOPMENT & DESIGN	PROJECT-RELATED SERVICES	SAFETY
SOFTWARE DEVELOPMENT	PROJECT MANAGEMENT	QUALIFICATION, VERIFICATION, VALIDATION
FIRMWARE DEVELOPMENT	SOFTWARE AND SYSTEM TEST	PROCESS COMPLIANCE & STANDARD CONSULTING
ELEKTRONIK DEVELOPMENT	OBSOLESCENCE MANAGEMENT	EN 50128, ISO 26262, IEC 62304 ISO 9001, EN 9100
	CONFIGURATION MANAGEMENT	

## USE CASES



### Software development for converter control in wind turbines.

#### The assignment:

We are supporting a leading manufacturer of wind turbines in the software development and validation of a new converter control system. The company has already relied on our expertise in previous projects, including the modernization of the plant control system. The basis for this is a standardized, model-based toolchain that connects all components.

#### Our task:

In the current project, the architecture of the main converter software is being fundamentally redesigned. The software is being developed entirely in MATLAB Simulink using a model-based approach. Proven algorithms from different programming languages – including FPGA implementations – are being mapped in Simulink and adapted to a new hardware platform.

#### The result:

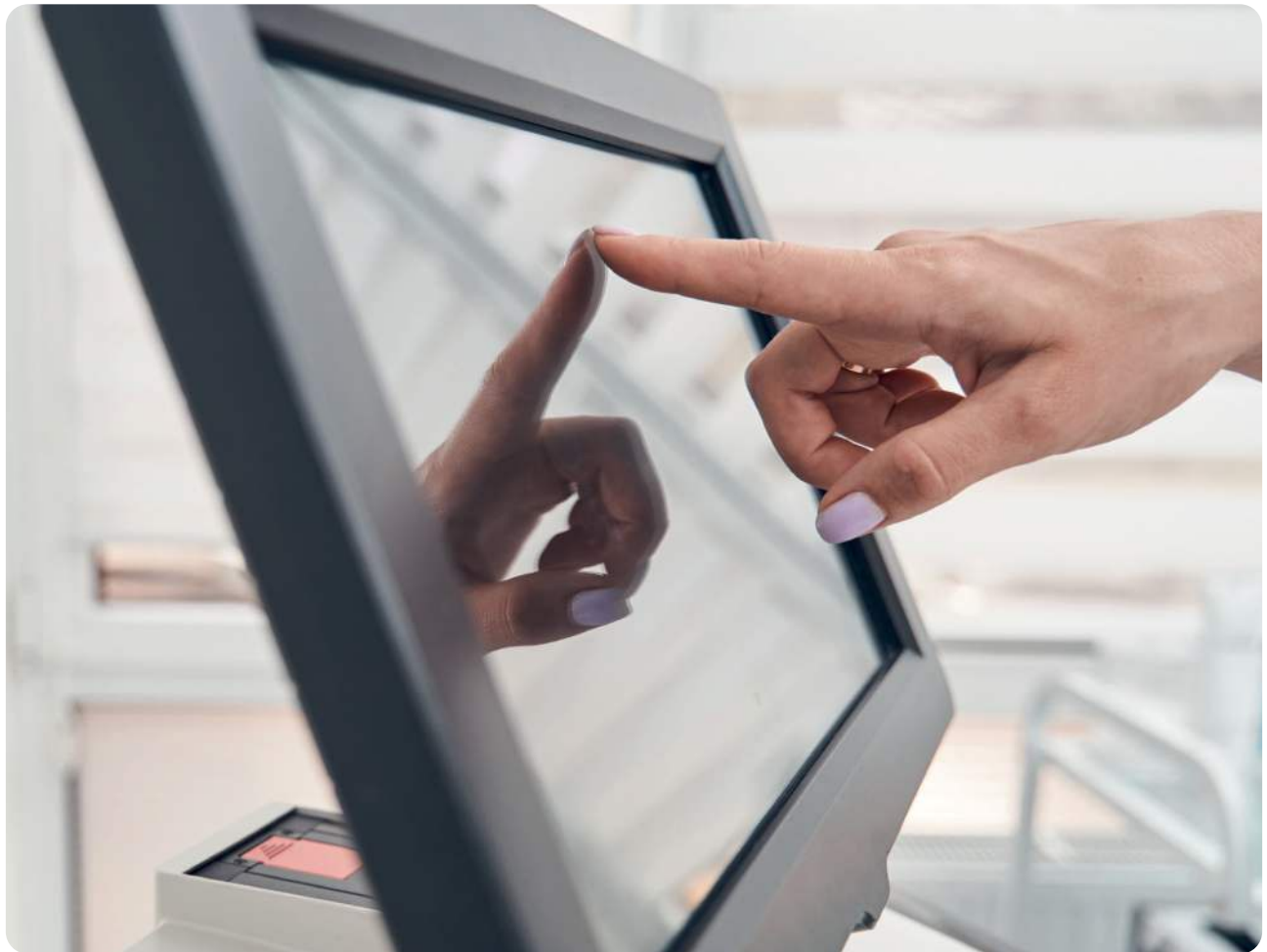
A high-performance converter control system that meets both the requirements of the electric drive train and the grid connection conditions (grid codes) of international markets.

Quality assurance is ensured by a comprehensive test concept:

- Unit tests with Simulink Test, automated system tests on a HiL test bench
- Test management via Jira, and
- Implementation and execution of test cases in EXAM.

The project team comprises more than 20 specialists divided into four agile teams.





### **Building automation with Linux build system.**

#### **The assignment:**

A real estate and building management company is expanding its business with its own products for digitizing office spaces. The customer is relying on the expertise of e.bs kumkeo to develop a “virtual room controller” – the central control unit for lighting, heating, and security. The hardware is based on a Raspberry Pi 4 on a customer-specific circuit board. Interfaces such as USB, Ethernet, and I2C, as well as communication via the KNX bus, are integrated. User interaction takes place via an eINK display with touch function.

#### **Our task:**

- Provision of a customized Linux system based on YOCTO
- Integration of drivers and additional packages
- Packaging of the customer application [C#] as a Debian package, including libraries

#### **The result:**

We are continuing to develop the system with a view to the future—including update mechanisms, extended logging functions, and system status messages. Security measures such as firmware signing, file system encryption, and a read-only root file system are planned. The system has already been successfully installed in the pilot series. Starting with the upcoming series production, the virtual room controller with our Linux system will be used in customer properties.

FOCUS

# Technology Expertise delivery Reliability-Trust.

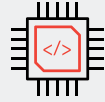
What we focus on:



Faster  
project start



Scaleable  
teams



Deep knowledge  
in hardware and  
software



Experience with  
safety  
standards



Agile methods  
& transparent  
processes



High  
quality  
standards

## Group-wide knowledge under one roof.

The ebs group was formed in 2024 from the merger of two companies, each with over 15 years of experience. Battery and energy storage expertise from Dornbirn. Embedded and safety engineering from Hamburg and Kiel. Today one Group. Three divisions. One responsibility.

We combine proven expertise: e.bs kumkeo GmbH is responsible for system engineering as ENG (Engineering), while e.battery systems AG is responsible for the BES (Battery & Electronics Systems) and ESS (Energy & Service Systems) divisions. With over 15 years of industry experience, we develop sustainable architectures for sectors in which reliability, availability and compliance with standards are crucial. From defense to energy to industry: we think and take responsibility for complex systems from a single source.

ebs group

### enhance

DC-LINK ENERGY BACKUP SOLUTION

**Safety for  
Wind Turbines**

PROVEN IN THE FIELD.  
CERTIFIED.  
SCALABLE.

ebs group

### ecore

SOFTWARE REFERENCE ARCHITECTURE

**Real-time control,  
made simple.**

ebs group

**Single-Level  
Multi-Level  
Energy Storage Systems**

CASE STUDIES FOR SMART ENERGY STORAGE SOLUTIONS

ebs-group.io/  
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## EXPERIENCE

# About us and our Philosophy.

e.bs kumkeo GmbH develops intelligent solutions for you using future-proof technologies, passion, and commitment. Our mission focuses on expertise, risk-taking, and innovation. Our market-oriented flexibility enables us to identify potential and use it creatively. We work together in an agile and goal-oriented manner to create sustainable added value for you through intelligent approaches.

The predecessor to e.bs kumkeo GmbH, kumkeo GmbH, was founded in Hamburg in 2009. Since then, we have a location specially equipped for the implementation of highly sensitive projects that meets the requirements of the German Federal Office for Information Security. In addition, we continuously invest in the measurable quality and security of our services.

Since 2024, we have been part of ebs group, a leading provider of innovative battery systems and energy solutions. This strategic partnership enables us to combine our expertise in hardware and software development with the group expertise to develop forward-looking technologies for sustainable energy systems.

### Get in touch with our experts.

Are you planning a new development project in the embedded or safety environment?  
We can show you how to get your solution to market faster.



**BERND SAGER**  
Chief Sales Officer



**TIMO HOFFMANN**  
Account Management Specialist



**DIANA KRAUSE**  
Sales Coordinator

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You can find out more about how we work on our website: [ebs-group.io/eng](https://ebs-group.io/eng) ↗



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## Engineering for Embedded-, Safety-, and Real-time Systems.

Have questions? We're happy to provide more information.  
Visit [ebs-group.io/eng](https://ebs-group.io/eng) or send us an email –  
our Engineering team is ready to discuss your project.

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**ebs group**

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