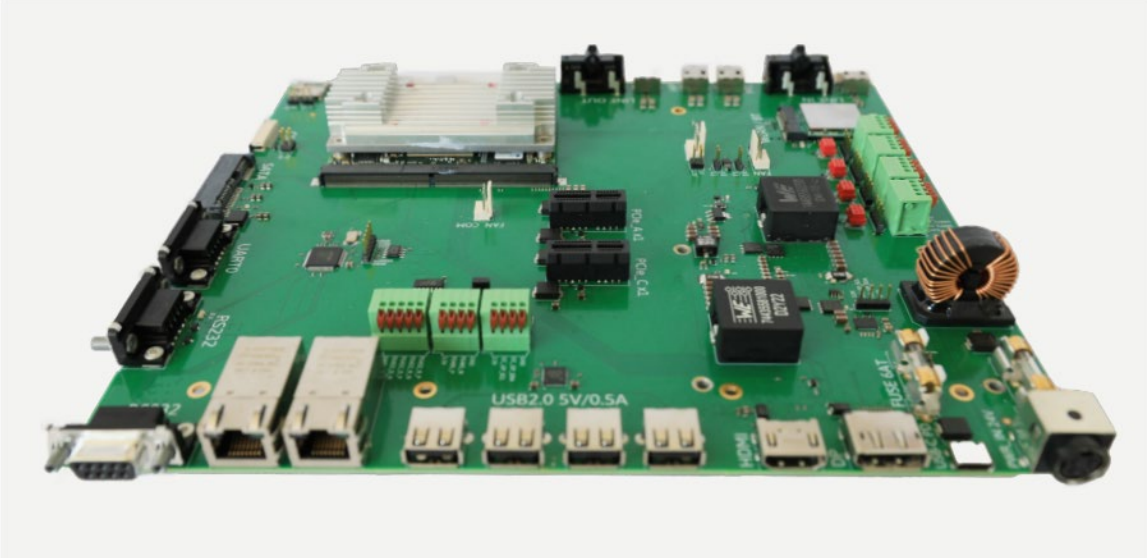
IFTEST

Carrier boards with Edge AI from the idea to series production

Edge AI changes the way machines and medical devices work. Data are no longer processed in the cloud, but directly on the device – securely, quickly and reliably. Made-to-measure hardware is required so that manufacturers of industrial and medical technology can make use of these benefits: carrier boards that are modular, powerful and future-proof. At the same time, AI is radically changing our world – faster and more profoundly than ever before. In order to remain competitive, it is essential not only to observe the dynamics of this technological development, but also to actively utilise it. Edge AI offers new opportunities here to employ intelligence efficiently and securely, directly at the data source.



As an EMS partner, we offer engineering, industrialisation and series production from a single source. In this way we help our customers to bring their innovations onto the market faster – and at the same time to secure long-term product availability.

CHALLENGES IN THE MACHINE AND MEDICAL INDUSTRIES

- Industry: production stops due to breakdowns, increasing requirements for energy efficiency and process optimisation, need for real-time data checking in production.
- Medical technology: strict regulations (MDR, FDA), protection of sensitive patient data, shorter diagnostic times and higher reliability.

Edge AI describes the local execution of AI models on devices such as sensors, cameras or industrial controllers – without detours via central Cloud servers. This reduces latency times, relieves networks and protects sensitive data against transmission and external access. Edge AI is ideal where computing power is required close to the data source – with restricted connectivity, high security requirements or a need for immediate reaction. This allows tasks such as image recognition, anomaly detection or predictive maintenance to be performed directly on the device in real-time.

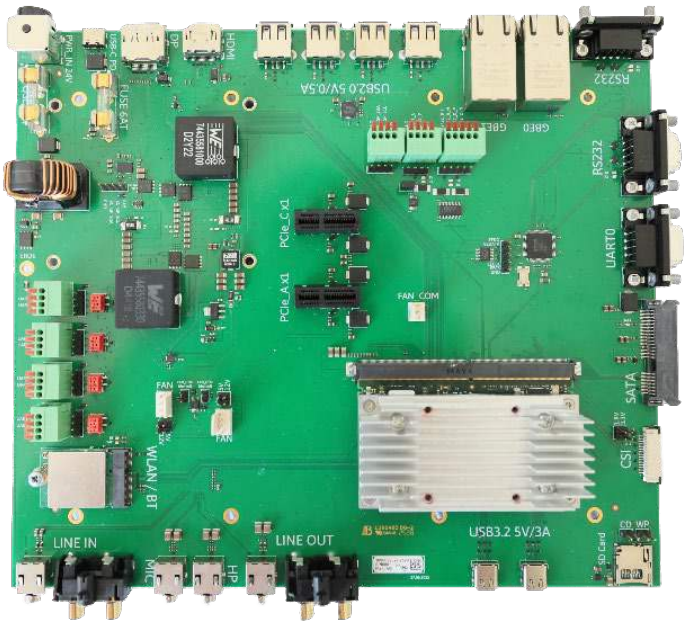
Outlook
Thanks to better hardware and more efficient models, Edge AI is growing rapidly – it is getting faster, more powerful and more cost-effective. Supported by high-performance and specialised AI chips, it is increasingly taking hold in industry, IoT, Smart City and autonomous systems (AGV, UAV). Collaborative and humanoid robots are also benefitting from the increase in performance, but are still technically complex and energy-intensive; the trend is towards a reduction of this aspect is by Edge AI.

EDGE AI NEEDS A POWERFUL PLATFORM – WE SUPPLY IT

Edge AI only unleashes its full potential when the hardware cooperates. Our carrier boards are the powerful basis for your next generation of intelligent products – developed for maximum computing power at the edge of the network, maximum flexibility and a clear vision: bringing your product innovations faster onto the market. With our latest carrier board concept with integrated Edge AI, you combine computing power, modular architecture and future safety in one compact system. Data processing takes place locally – quickly, securely and without Cloud dependency.

Our carrier boards have been specially developed for use in industry and medical technology:
- Flexible hardware architecture: modular principle with energy and communication interfaces, sensors, actuators, safety functions
- Modular software architecture: platform-independent applications, hardware abstraction, GUI and algorithms are freely scalable
- Edge-AI ready: Local data analysis in real-time, data protection thanks to processing directly on the device, reduced Cloud requirement
- Future safety: plug-in COM module for computing power & memory expansion, lifecycle management to counteract obsolescence

Your benefits at a glance:
- Faster time-to-market thanks to short development cycles
- Future-proof architecture thanks to modular extendibility
- Gain in efficiency thanks to local data processing
- Uncompromising data sovereignty without Cloud upload
- Scalability for individual requirements and product series



PRACTICAL EXAMPLE 1 - INDUSTRY: ENERGY EFFICIENCY & PROCESS OPTIMISATION

Challenge:
A manufacturer of industrial plants wanted to lower the energy consumption of its production lines and at the same time increase process efficiency. Up to that point there had been no real-time analysis of the energy and machine data – cost reduction potentials remained unused.

Our solution
› Integration of a carrier board with Edge AI in the control units
› Local acquisition and analysis of energy and process data (power consumption, temperature, load distribution)
› Real-time control for optimised utilisation and lower energy losses
› Interfaces to existing Industry 4.0 systems

Result
› Up to 25 % lower energy consumption thanks to load peak optimisation
› More stable processes thanks to continuous monitoring
› Reduced operating costs thanks to higher efficiency
› Contribution to sustainability and CO_2 goals

PRACTICAL EXAMPLE 2 – MEDICAL TECHNOLOGY: REDESIGN OF A THERAPY APPLIANCE

Challenge:
A leading manufacturer of medical technology had to modernise its established vacuum-assisted closure device: discontinued components were endangering series production, while at the same time functional extensions and fast recertification were necessary.

Our solution
› Electronic redesign on the basis of a modular carrier board architecture
› Integration of new processors, voltage transformers and sensors
› Software abstraction layer for compatibility of old and new hardware
› Display upgrade with EMC-tested filters • Accompaniment of the recertification to MedTech standards

Result
› Seamless series production without interruptions
› Fast recertification within the foreseen schedule
› Functional extension despite unchanged housing
› Procedure model transferable to industrial projects with similar obsolescence or upgrade challenges

EDGE AI FOR MANY BRANCHES OF INDUSTRY: FROM MEDICINE TO SMART CITY

› Health service:	Image processing (e.g. MRT/ultrasound), remote monitoring, diagnostics
› Smart Home:	Voice control, security functions, energy management
› Mobility/autonomous systems:	Advanced driver-assistance systems, onboard processing, drones
› Manufacturing/industry:	Fault recognition, adaptive process control, reduced downtimes
› Retailers/smart spaces:	Customer behaviour, operating efficiency, on-device inference
› Agriculture:	Environmental monitoring, intelligent harvesting machines, pest infestation
› Energy/supply networks:	Anomaly recognition, load distribution, grid stability
› Smart cities:	Alarm systems, traffic guidance systems

READY TO INNOVATE?

Use the advantages of carrier boards with Edge AI now for your next project.
We accompany you from the initial idea and design through to series production – fast, secure and standard-compliant.

Your next step

› Book a free design workshop
› We analyse your project together with you and show you how you can integrate Edge AI into your products.
› Non-binding consultation
› Clarify open questions directly with our experts from development and production.
› Discover more success stories
› On our website you will find more practical examples from industry and medical technology.

Would you like to learn more about carrier boards, made-to-measure for your application? Then download the white paper "Carrier Boards" at: https://iftest. ch/whitepaper-und-factsheets/

YOUR BENEFITS WITH US AS YOUR PARTNER

› Shorter development cycles
› From the idea to series production from a single source
› Experience with MDR, FDA and industrial standards
› Long-term availability thanks to lifecycle management

EDGE AI: THE TREND IS ALREADY HERE – TAKE THE OPPORTUNITY NOW TO BE AT THE FOREFRONT!

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