



MODULAR & EDGE COMPUTING

Rugged, modular embedded computers that withstand harsh environments with extreme temperatures, shock, vibration, dust, humidity and chemical influence

As a global megatrend, digitalization is generating growth, enabling innovative business models, and providing new revenue opportunities in the rail and public transportation markets. Modern railway vehicles are equipped with the latest digital technologies, offering more services to passengers and improving comfort and safety onboard.

In addition, railway operators minimize downtime and increase service reliability by collecting and analyzing data generated onboard. duagon embedded modular computers and box PCs support edge computing architecture by being near the source of data, providing pre-processing capabilities and offload data to a remote server or cloud.

OUR OFFERING

Our fully modular embedded computers are designed to withstand harsh environments with extreme temperatures, shock, vibration, dust, humidity and chemical influence as can be found on trains. They offer CPU scalability, I/O flexibility and a robust, fanless conduction cooled enclosure.



duagon's box PCs are a selection of individual prefabricated components that can combine various functions as required to create computing platforms for a range of rail onboard, wayside and industrial IoT applications. The modules are combined in flexible built-to-order configurations that can be conveniently mounted on a space-saving standard DIN-rail, wall/flat surface and 19" mounting.



ME10 5G Wireless Communication Module for Embedded Computer System

The ME10 is a modular extension for embedded applications in transportation systems, e.g. in trains or wayside and is the ideal solution for communication from the train to the back office.

The module adds wireless connectivity to the system CPU. It comes with two M.2 slots, of which one is by default equipped with a 5G module.

Together with the modular computer MC50M, the ME10 supports rail onboard applications including predictive maintenance, IoT gateway, diagnostics server, smart vehicle, passenger information and ticketing systems.



BL72E Rugged Embedded Box PC with AMD Ryzen™ for Transportation

The BL72E is a fanless, maintenance-free box PC with AMD Ryzen™ for embedded applications in rail and public transportation markets. It offers a great performance to power ratio suitable for a range of onboard applications including entertainment servers or video surveillance systems (CCTV).

With up to two optional 4G LTE modems, the BL72E can take over typical on-board wireless functions, such as an internet connection for passengers or locating the vehicle.



BC51R Rugged IP65 Box PC for Communication & Control

The BC51R is powered by an Intel® Atom processor from the E3900 series. Its IP65 housing is ultra-rugged, protecting the computer against water jets from any angle and dust.

Optional wireless communication features include 4G LTE modem, WLAN and GNSS.



Intelligent CCTV

For an intelligent video surveillance for seat occupancy or passenger aggression detection on trains and public transportation vehicles, train builders and system integrators rely on duagon high-performance box PC BL72E.

Featuring AMD Ryzen Embedded V1000 APU the BL72E provides high CPU power for data analytics and algorithms. For wireless communication it is equipped with two PCI Express Mini Card slots for GNSS, LTE, WLAN and offers a multitude of I/O. The design is fanless.

Additionally, the BL72E is used for video processing and semi-autonomous driving and obstacle detection. For example, video streams from the outside cameras can be processed to identify obstacles, e.g. in front of trams.

Product:
Rugged embedded box PC
BL72E

APPLICATION EXAMPLES

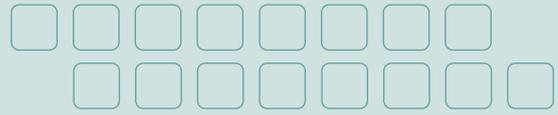
Door Control Unit

To control electric train doors and doorsteps a small-boxed solution with SIL2 certification is needed. The duagon fully customized box PC with 3 ARM processors controls digital outputs and 'motor outputs' (half bridges) to drive electrical motors.

Additionally, status and feedback signals from sensors or train control signals are read in, the box PC communicates with other train control units and processes and stores data e.g. maintenance.

Product:
Embedded modular box PC (custom-specific)





YOUR APPLICATION - OUR COMPETENCE

The duagon advantage

Complete service – reliable embedded electronic products and software, with integration and life cycle services.

- ▶ At duagon, our customers have the advantage of having everything they need for their secure application supplied by a single supplier. By having secure hardware products and software features all under one roof, our customers have one single point of contact working with them from the very beginning of their project, through to continued support once the system is running.
- ▶ For various train-borne communication network applications including network/zone separation, protocol translation and train backbone communication, duagon is your leading partner for reliable and secure data communication. Our systems are complemented by engineering services and high-quality application software support to provide the broadest range of train-borne communication protocols and key features like cyber security, virtualization and safe computing.
- ▶ duagon boards and systems are not only modular, customizable and secure but also developed to meet requirements such as temperature ranges between -40°C and +85°C through convection or conduction cooling, shock, vibration, chemical influence or the option of coating against humidity.
- ▶ duagon is certified according to ISO 9001 and ISO 14001, plus EN/AS 9100 (aerospace) and IRIS (railways) and provides systems according to ISO 7637-2 (road traffic) requirements.
- ▶ We carry out the preliminary qualifications in our own environmental test lab (temperature, shock, vibration, humidity), high-voltage and EMC chambers. We are accredited by DAkkS, according to DIN EN ISO 17025:2018 for EMC, environmental simulation tests and safety of electrical equipment.



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