



LEADING THE EMBEDDED FUTURE



INTERFACES, GATEWAYS & I/Os

Communication technology for all fieldbusses in various form factors and host interfaces

Interface cards enable train sub-systems to exchange real-time control, monitoring, and status data to ensure operational safety. Additionally, the interfaces encapsulate cyber security features to protect the sub-systems from interference, and web services provide a convenient mechanism to, for example, access system information or update software remotely. Gateways allow the interconnection of different communication technologies. Typical applications include condition monitoring of train communication networks and the retrofitting of existing train networks or incorporating new functionality based on different communication technologies.

Many train architectures require additional analog and digital signals which are sometimes located at a distance from the main processing unit. A compact remote I/O module enables any controller to add more inputs and outputs, leveraging existing train communication networks.

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OUR OFFERING

duagon's product portfolio includes an extensive set of protocols that cover the most commonly used train communication technologies. The broad range of interfaces, gateways and remote I/Os are designed to support any system and train architecture. All devices are easy-to-use and provide our customers with superior flexibility.

Our communication devices are based on duagon's future-proof hardware, developed for long-term availability and scalability.



Interfaces

duagon offers a range of interfaces in various form factors from chip-sized to CompactPCI.

The interfaces are available in several train-borne communication networks including real-time Ethernet, MVB, CAN and Serial. To support any type of host system, the interfaces support different host interfaces including serial, parallel and PCI express.

The interface cards provide an easy-to-use API to enable the host system to access the communication functionality.

Enable train sub-systems to exchange real-time control, monitoring, and status data to ensure operational safety

Encapsulate cyber security features to protect the sub-systems from interference

Web services provide a convenient mechanism to access system information or update software remotely

Gateways

To interconnect any network or protocol, be it for retrofit or for greenfield projects, duagon has the right gateway solution in its portfolio.

In addition to state of the art hard- and software, we offer a wide range of training and integration packages to facilitate the design-in of our gateways in your network architecture.

All our gateways can be ordered with demo applications and can be programmed using a standard GNU C development environment.

Allow the interconnection of different communication technologies

Condition monitoring of train communication networks

Retrofitting of existing train networks or incorporating new functionality based on different communication technologies.

Compact Remote I/O

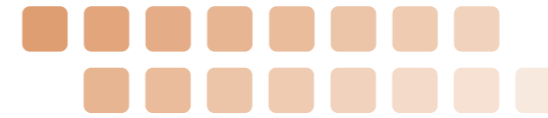
To extend system capabilities by expanding the number and types of inputs and outputs, duagon offers various remote I/O modules (RIOMs).

The RIOMs support the same train communication protocols customers know from our interfaces and gateways. The devices enable our customers to map any signal to and from a real-time protocol datagram.

Additionally, the signals can be logically combined and pre-processed to optimize data traffic.

Extend system capabilities by expanding the number and types of inputs and outputs

Enable users to map any signal to and from a real-time protocol datagram



Monitoring with MVB Read-Only

For monitoring the operation of locomotives, a D503 MVB read-only is installed to sniff and log all process data transmitted via MVB. The data is transferred via Ethernet (UDP) to a computer to be stored. It can then be transferred to the off-shore IT infrastructure via cellular network (e.g., preventive maintenance, diagnostics).

Product:

D503HS "platform" with development library (custom-specific)

D503GS "gateway" with default gateway application (configure MVB/ETH interface or mapping)

APPLICATION EXAMPLES

Subsystem Integration

Original equipment manufacturers for train subsystems such as doors, brakes, traction or event recorders have the need to adapt their subsystem in accordance with the train architecture requirements in relation to communication and service protocols, availability, and security. This flexibility can be provided by encapsulating the communication interface on an exchangeable module.

Integrating duagon PC/104-based interface cards like the D153E enables an OEM to adapt the subsystem to any customer requirements on a project-by-project basis. The real-time Ethernet interface supports TRDP, IPTCom, EtherNet/CIP and PROFINET, and may be used in different network topologies.

Product:
PC/104 Real-time Ethernet Interface
D153E



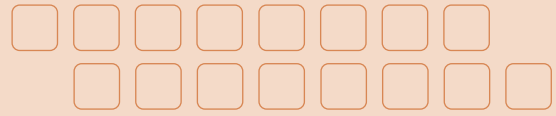
Train Wake-Up Signal

Modern urban transportation is highly automated including the train depot. In order to support Automatic Train Operation (ATO), operators need the capability to automate the train start-up process. A remote I/O provides the functionality to signal a train to wake up based on an Ethernet packet that is being sent by the control center. The compact RIOM D10021E offers digital input and output channels and includes security features to enable secure Ethernet-based communication.

Product:

Compact remote Ethernet I/O module
D10021E





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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