

## General Features

The D503 is an Ethernet-to-MVB gateway with the following physical interfaces:

- MVB on two 9-pin male/female SUB-S connectors.
- Up to two Ethernet interfaces ETH0 and ETH1 on M12 (female, D-coded) connectors.

The optional Ethernet interface ETH1 is intended to be used as a redundant line according to the **IEC 62439** PRP protocol or as a separate channel for configuration.

The Ethernet interfaces comply with **IEEE 802.3** and the internal logic supports the "Ethernet on traction vehicles" standard **IEC 61375-3-4**.

The MVB interface complies to the TCN standard **IEC 61375**. The gateway is integrated in a stainless-steel housing that is mounted on a DIN rail or using M4 screws.

The device can be powered directly from the vehicle battery or powered over Ethernet (PoE).

The D503 is designed for the harsh traction environment and conforms to the **EN 50121**, **EN 50155**, and **IEC 61373** standards, e.g. by:

- -40 °C to +70°C Ambient temperature range
- coating against humidity
- enhanced EMI and vibration robustness

The D500 Ethernet gateway series covers the following vehicle bus systems:

- D501 Ethernet - RS232
- D502 Ethernet - RS485/RS422
- D503 Ethernet - MVB (this document)
- D504 Ethernet - CAN
- D507 Ethernet - Ethernet (protocol translation)

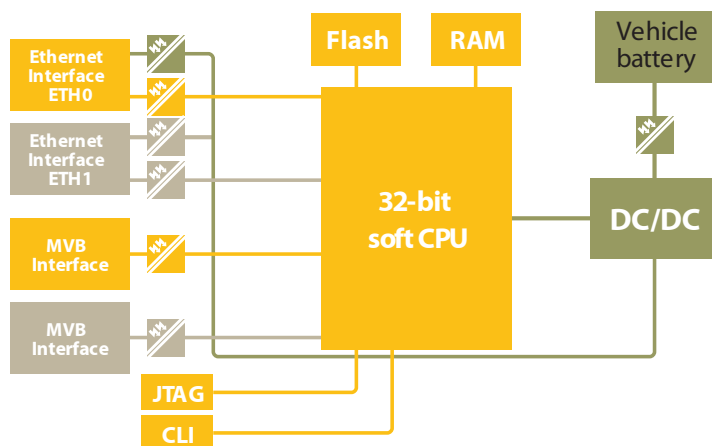
## Key Benefits

- Integrated train manufacturer specific webservices
- Hardware prioritisation within the duagon's own Ethernet controller
- Proprietary high-performance UDP Stack (optimised for cyclic process data telegrams)
- Encapsulation of real-time Ethernet protocol stacks
- Fully compliant with **IEEE 802.3**, **EN 50155**, **EN 50121**, **IEC 61373** and **IEC 61375**

## Application Examples

- Generic Ethernet Interface for various real-time protocols

## D503 Hardware Structure



## Life Cycle Costs

Total cost of ownership was an important aspect when creating the installation, maintenance and service concept. Further-

more, to avoid service expenses, the gateway has strictly been designed without the usage of electrolytic capacitors.

# Technical Data

<b>Ethernet Interface 1 + 2</b>	<ul style="list-style-type: none"> <li>Physical layers according to <b>IEEE 802.3</b> 100BASE-TX</li> <li>M12 (D-Coded) according to <b>IEC 61076</b></li> <li>Full duplex mode, Auto-Negotiation, Auto-Polarity, Auto-Crossing</li> <li>1.5 kVAC galvanic isolation</li> </ul>
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<b>Ethernet Protocols</b>	<ul style="list-style-type: none"> <li>TCP/IP, UDP Sockets</li> <li>IPTCom</li> <li>EtherNet/IP, CIP</li> <li>TRDP</li> <li>PROFINET*</li> </ul>
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<b>MVB Interface</b>	<ul style="list-style-type: none"> <li>4096 Process data ports</li> <li>Physical layer: ESD+ or EMD</li> <li>Integrated 120 Ω termination resistance</li> <li>Two 9-pole SUB-D connectors (male/female)</li> <li>Free selectable UNC or M3 Bolt (default)</li> </ul>
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<b>CPU base System</b>	<ul style="list-style-type: none"> <li>32-bit soft processor</li> <li>Programmable in standard C</li> <li>Flash file system</li> </ul>
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<b>Diagnostic/Service</b>	<ul style="list-style-type: none"> <li>Device status information/identification available through host interface</li> <li>Firmware update via Ethernet</li> <li>JTAG and serial line available</li> </ul>
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<b>Supply Voltage</b>	<ul style="list-style-type: none"> <li>Single power supply 24 – 110 Vdc</li> <li>Power over Ethernet (PoE)</li> </ul>
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<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>Powered directly from battery <math>P_{max} &lt; 3W</math></li> <li>Interruption Class C2 ceramic capacitor on board, no need to replace capacitors due to aging</li> </ul>
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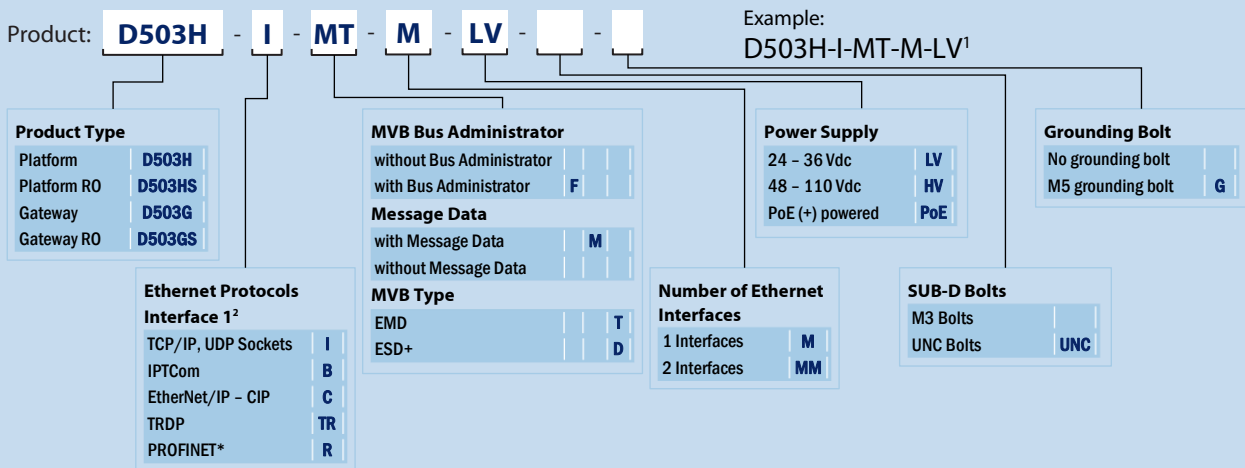
<b>Operating Conditions</b>	<ul style="list-style-type: none"> <li>Ambient temperature: -40 to +70°C (<b>EN 50155</b>, class TX)</li> <li>Relative humidity: 75%, max 95% for 30 days per year (conformal coating) according to <b>EN 60068</b></li> <li>Shock and vibration: According to <b>IEC 61373</b> category 1, class B</li> <li>EMI: According to <b>EN 50121</b> and <b>EN 50155</b></li> </ul>
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<b>Physical Characteristics</b>	<ul style="list-style-type: none"> <li>Housing: <ul style="list-style-type: none"> <li>Stainless steel, IP30C protection</li> </ul> </li> <li>Dimensions: 120 × 106 × 32 mm</li> <li>Weight: 415 g</li> </ul>
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<b>Environment</b>	<ul style="list-style-type: none"> <li>Fully compliant with RoHS and REACH</li> <li>100% cyclic climatic testing</li> </ul>
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## Product Ordering Table



<sup>1</sup> default order options

<sup>2</sup> Ethernet "Sockets" is included on all interfaces

\* contact duagon for lead times and availability

## Related Documents

**Data Sheet D503**      D503\_DS.pdf  
**Product Ordering Guide**      order\_ug.pdf

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