

General Features

The D502 is an easy to configure RS485/RS422-to-Ethernet gateway. It provides up to two RS485/RS422 interfaces SER0 and SER1 on 9-pin male SUB-D connectors and up to two Ethernet interfaces ETH0 and ETH1 on M12 connectors.

The optional Ethernet interface ETH1 is intended to be used as a redundant line or as a separate channel for configuration.

The Ethernet interfaces comply with IEEE 802.3 and the internal logic is prepared for the future "Ethernet on traction vehicles" standard IEC 61375-3-4.

The gateway is integrated in a stainless-steel housing that is mounted on a DIN rail or using M4 screws. The device is powered directly from the vehicle battery.

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

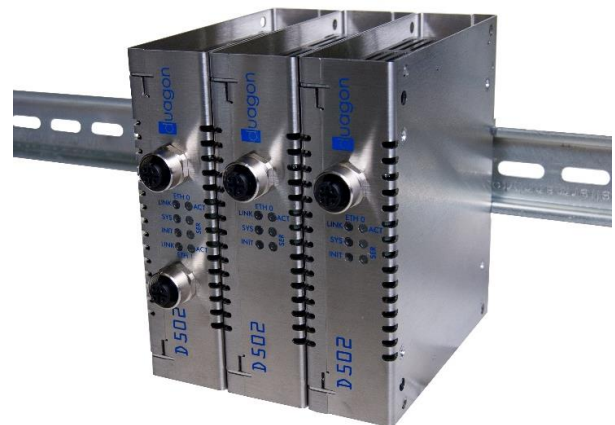
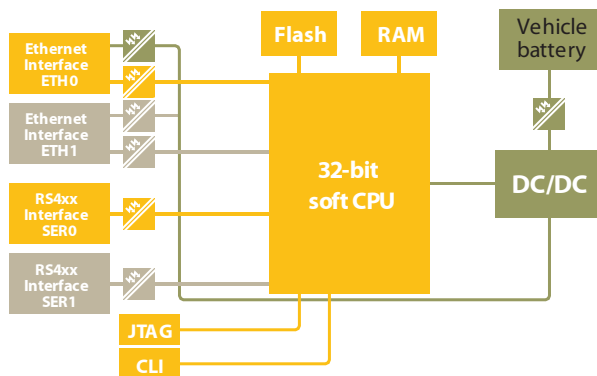
Key Benefits

- 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 to EN 50128, EN 50129, IEEE 802.3, EN 50155, EN 50121, IEC 61373 and IEC 61375

Application Examples

- Generic Ethernet Interface for various real-time protocols

D502 Hardware Architecture



Life Cycle Cost

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

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

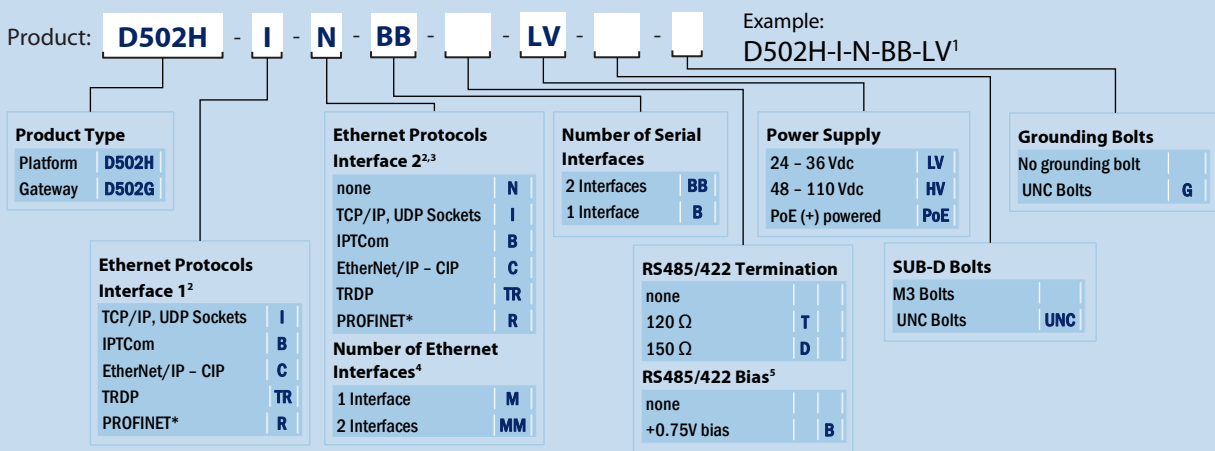
Technical Data

CPU base System	<ul style="list-style-type: none"> – 32-bit soft-CPU – Programmable in standard C – Flash file system
Ethernet Interface 1 + 2	<ul style="list-style-type: none"> – Physical layers according to IEEE 802.3 100Base-TX – M12 (D-Coded) according to IEC 61076 – Full duplex mode, Auto-Negotiation, Auto-Polarity, Auto-Crossing – 1.5KVAC galvanic isolation
Ethernet Protocols	<ul style="list-style-type: none"> – TCP/IP, UDP Sockets – IPTCom – EtherNet/IP - CIP – TRDP – PROFINET*
Serial Interface	<ul style="list-style-type: none"> – Two 9-pin male SUB-D connectors – Serial interfaces galvanically insulated to the digital logic and each other – Termination either 120Ω, 150Ω or none depending on selected hardware options
Diagnostic / Service	<ul style="list-style-type: none"> – Device status information/identification available through host interface – Firmware update via Ethernet – JTAG and serial line available

Supply Voltage	<ul style="list-style-type: none"> – Single power supply 24 – 110 Vdc – Power over Ethernet (PoE)
Power Consumption	<ul style="list-style-type: none"> – Powered directly from battery $P_{max} < 3W$ – Interruption Class C2 ceramic capacitor on board, no need to replace capacitors due to aging
Operating Conditions	<ul style="list-style-type: none"> – Ambient temperature: –40 to +70°C (EN 50155, class TX) – Relative humidity: 75%, max 95% for 30 days per year (conformal coating) according to EN 60068 – Shock and vibration: According to IEC 61373 category 1, class B – EMI: According to EN 50121 and EN 50155
Physical Characteristics	<ul style="list-style-type: none"> – Housing: metal, IP30 protection – Dimensions: 120 × 106 × 32 mm – Weight: 415 g
Environment	<ul style="list-style-type: none"> – Fully compliant with RoHS and REACH – 100% 48h cyclic climatic testing

d-023066-041685

Product Ordering Table



¹ default order options
² Ethernet "Sockets" is included on all interfaces
³ Interface two is optional
⁴ only for legacy products
⁵ only available with 120 Ω termination
 * contact duagon for lead times and availability

Related Documents

- Data Sheet D502**  D502_DS.pdf
- Configuration Guide**  config_ug.pdf
- Product Ordering Guide**  order_ug.pdf

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