

- Proprietary high-performance Ethernet communication stack; optimized for cyclic process data
- Support for most common real-time Ethernet protocols including TRDP, IPTCom and EtherNet/IP – CIP
- Optional redundant Ethernet interface
- duagon web server for remote diagnostics and firmware updates
- Standard C development library to design customer-specific gateway application



ETHERNET-TO-RS232 GATEWAY

The D501 is an easy to configure Ethernet-to-RS232 gateway. It provides up to two RS232 interfaces (SER0/SER1) as well as two 10/100 Mbit Ethernet interfaces (ETH0/ETH1). The Ethernet connectors comply with IEC 61076-2-101 (D-coded; female).

The Ethernet interfaces comply with IEEE 802.3 supporting 10BASE-T or 100BASE-TX, full duplex mode, auto-negotiation and auto MDI-X. Furthermore, the internal logic supports the "Ethernet on traction vehicles" standard IEC 61375-3-4.

VARIETY OF PRODUCT OPTIONS

The optional second Ethernet interface ETH1 is intended to be used as a redundant or as a separate channel for remote diagnostic and maintenance purposes.

duagon's gateways are available in two variants – as platform to build a customer-specific application or as gateway with a standard configurable gateway application. The platform variant is accompanied by a development library that enables fast and efficient design of customer-specific applications.

The gateway is integrated in a stainless-steel housing that can be mounted on a DIN rail or using M4 screws. The device can be powered directly from the vehicle battery or by Power over Ethernet (PoE).

CYBERSECURITY SUITE AVAILABLE

duagon offers different cybersecurity packages to harden the host system. The available packages include features such as secure communication for remote access, centralized user access management, secure event logging and secure firmware updates.

FOR ROLLING STOCK ENVIRONMENTS

The D501 is designed for harsh rolling stock environment and complies with the EN 50155, EN 50121, and IEC 61373 standards: it withstands -40 °C to +70 °C ambient temperatures, complies with interruption voltage supply class S2, is coated against humidity and provides enhanced EMI and vibration robustness.

- **Contact duagon** for custom software applications not covered by the configurable standard application.



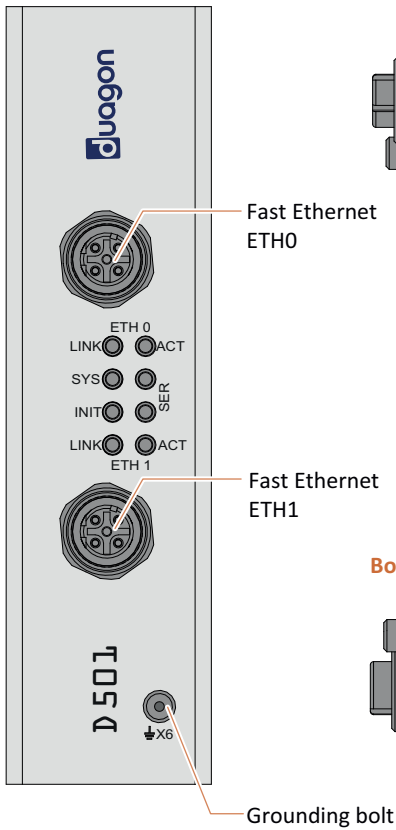
www.duagon.com/products/d501/

DATA SHEET

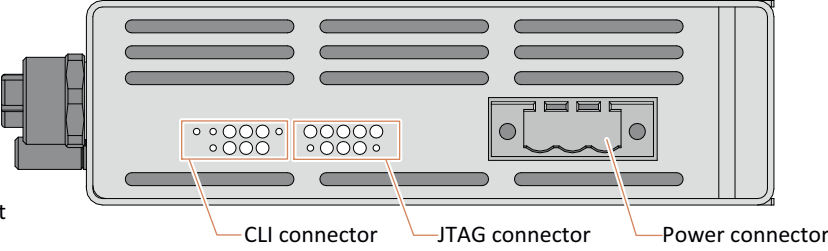


D501 | DIAGRAM

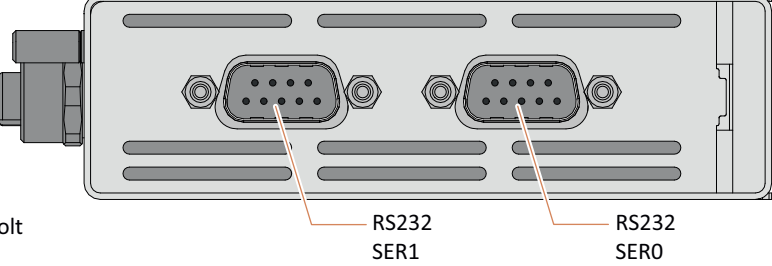
Front View



Top View



Bottom View



D501 | TECHNICAL DATA

ETHERNET INTERFACE FUNCTIONALITY

- General network support: IPv4
- Protocols
 - Interface 0: TRDP, IPTCom, EtherNet/IP - CIP, CIP Scanner Light, TRDP with Safe Data Transmission (SDTv2), PROFINET, TCP/IP with UDP Sockets
 - Interface 1: TRDP, IPTCom, EtherNet/IP - CIP, CIP Scanner Light, TRDP with Safe Data Transmission (SDTv2), PROFINET, TCP/IP with UDP Sockets
- Web services
 - duagon Web Maintenance
 - Alstom Web Maintenance
- User configuration interfaces
 - Command line interface (CLI)
 - HTTP
 - FTP

CPU

- FPGA-based soft CPU, 32-bit, 75 MHz

INTERFACES

- Ethernet
 - 2 × 10BASE-T/100BASE-TX, M12, D-coded, receptacle
- Serial
 - 2 × RS232 isolated, D-Sub, 9-pin, plug
- LED
 - Status: initialization, system status
 - RS232: activity
 - Ethernet: link, activity

ELECTRICAL SPECIFICATIONS

- Supply voltage
 - 24 V DC to 36 V DC nom. (EN 50155)
 - 48 V DC to 110 V DC nom. (EN 50155)
 - Power over Ethernet (PoE)
- Power consumption: 3 W max.

MECHANICAL SPECIFICATIONS

- Dimensions: (W) 120 mm, (D) 31.6 mm, (H) 106 mm
- Weight: 415 g

PRODUCT COMPLIANCE: FUNCTIONS

- Ethernet
 - Ethernet: IEEE 802.3-2012
 - Fast Ethernet (FE): IEEE 802.3u
 - Port-based network access control: IEEE 802.1X
 - Link Layer Discovery Protocol (LLDP): IEEE 802.1AB
 - Link Aggregation Control Protocol (LACP): IEEE 802.3ad
- Train Communication Network (TCN)
 - Part 1: General architecture: IEC 61375-1:2012
 - Part 2-3: TCN communication profile, Annex A: Train Real-Time Data Protocol (TRDP): IEC 61375-2-3:2015
 - Part 3-4: Ethernet Consist Network (ECN): IEC 61375-3-4:2014

PRODUCT COMPLIANCE: RAIL - ROLLING STOCK

- Compliance level: This product is prepared for use in EN 50155 systems. Some parameters are system-dependent and are specified on system level.
- Operating temperature: -40 °C to +70 °C, +85 °C for 10 min (EN 50155:2017, class OT4, ST1)
- Rapid temperature variations: EN 50155:2017, class H1, no requirements
- Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb)
- Altitude: +1800 m max. (EN 50125-1:2014, class AX)
- Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Vibration: 10 min @ 1.01 m/s² (functional) and 5 h @ 5.72 m/s² (long-life) (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Power supply
 - Interruption of voltage supply: 10 ms (EN 50155:2017, class S2)
- Protective coatings: EN 50155:2017, class PC2 (Any PCB protected on both sides)
- Useful life: 20 years (EN 50155:2017, class L4)



D501 | ORDERING INFORMATION

ORDERING OPTIONS

1

Product Type

G: Gateway

H: Platform

2

Ethernet Interface 0

I: TCP/IP, UDP sockets

B: IPTCom

C: EtherNet/IP- CIP

R: PROFINET

TR:TRDP

3

Ethernet Interface 1

N: None

I: TCP/IP, UDP sockets

B: IPTCom

C: EtherNet/IP- CIP

R: PROFINET

TR:TRDP

4

Serial Interfaces

B: one

BB: two

5

Power Supply

LV: 24 V to 36 V DC

HV: 48 V to 110 V DC

PoE: Power over Ethernet (PD)

6

D-Sub Bolts

<Empty>: M3 bolts

UNC: UNC bolts

7

Grounding Bolt

G: with grounding bolt

<Empty>: no grounding bolt (legacy)

1

2

3

4

5

6

7

D501 - X - X - X - X - X - X - X (final order code)

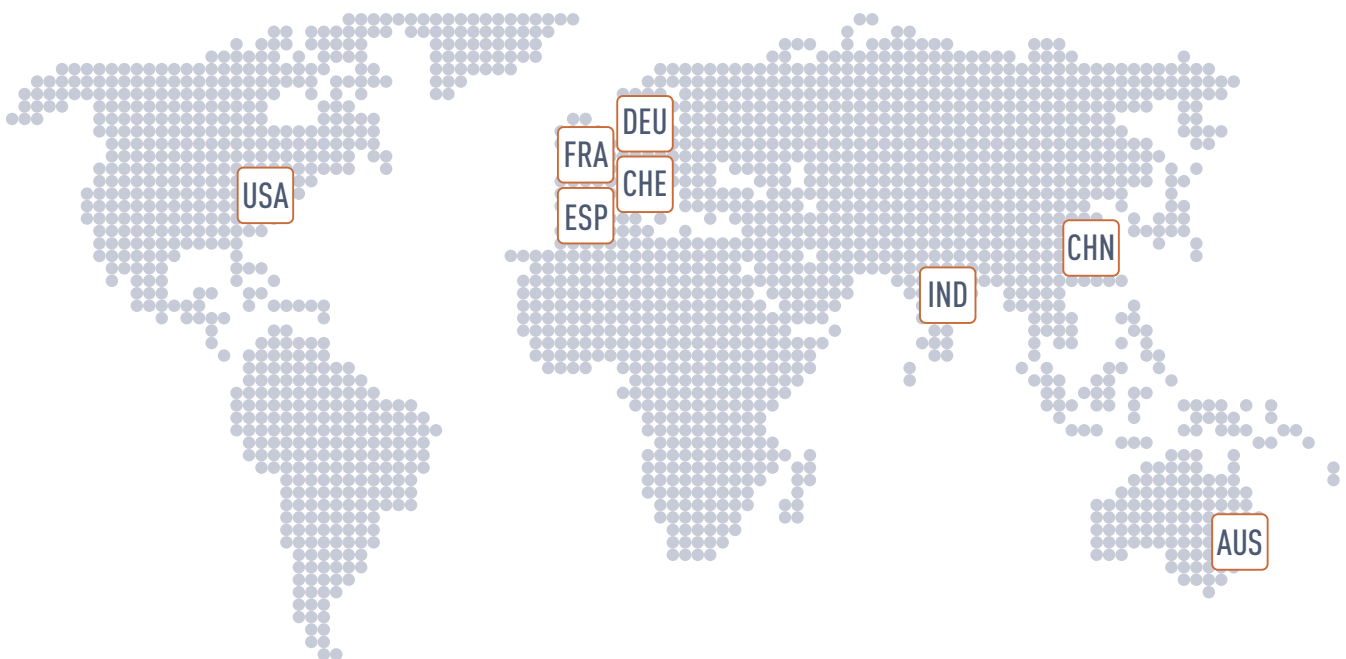
Group	Option	Note
2, 3	all	Ethernet Sockets is included on all interfaces
3	all	Interface two is optional
3	R	Contact duagon for availability and lead times



LEADING THE EMBEDDED FUTURE

duagon WORLDWIDE

duagon has a global presence with support and sales representatives across eight countries. With three decentralized engineering and production sites, our customers take advantage of the added competence and flexibility.



www.duagon.com

Copyright © 2024 duagon AG.
All rights reserved.

All data is for information purposes only and not guaranteed for legal purposes. Information has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Specifications are subject to change without notice. duagon is not responsible for the results of any actions taken on the basis of information in the publication, nor for any error in or omission from the publication.