



### Main Features

- ▶ Proprietary Ethernet stack for process data prioritization with decreased data latency
- ▶ Support for most common real-time Ethernet protocols including EtherNet/IP – CIP, IPTCom, PROFINET and TRDP
- ▶ Optional full-featured 3-port switch and onboard bypass relays
- ▶ Support for redundancy protocols, e.g. RSTP
- ▶ Optional support for VLAN-tagged packets according to IEEE 802.1Q
- ▶ duagon web server for remote firmware updates
- ▶ -40 to +85°C operating temperature

## Overview

The D153E is a multi-purpose dual Ethernet Controller Interface with embedded processing power, designed for PC/104 host systems. The integrated Ethernet controllers, designed by duagon, feature hardware prioritisation and very low jitter. The intelligent component encapsulates all Ethernet-relevant functions on a standardized PC/104 module. It can be considered as a communication module that handles various Ethernet communications protocol. The D153E lowers the processing performance requirements on the host system, as there is no need for additional CPU power for the different real-time Ethernet stack.

The interface card is fully compliant to IEEE 802.3 and supports features like Auto-Polarity, Auto-Negotiation and Auto-MDI-X.

An optional full-featured 3-port switch can be integrated to enable ring topologies directly on the D153E. The optional bypass relays keep the ring topology also in case of a malfunction of the D153E. The device further supports the Rapid Spanning Tree Protocol (RSTP) according to

IEEE 802.1w. For additional redundancy protocol please contact duagon.

The D153E is prepared for the “Ethernet on traction vehicles” standard IEC 61375-3-4. It supports various Ethernet protocols like TRDP, CIP, IPTCom, PROFINET, UDP or TCP/IP. Optionally the device supports VLAN-tagged packets according to IEEE 802.1Q. This feature may be used to separate network traffic, e.g. for different protocols.

The interface card integrates the magnetics with a galvanic isolation of 1.5 kVrms, the PHY, the complete protocol controller and a simple host interface.

With duagon’s driver kit, the D153E, featuring an easy-to-use UART emulation, can be integrated very quickly on almost any host system through a small register set (each 8-bit long) - The D153E does not need a wide address range compared to a solution based on dual-ported memory.

The D153E is designed for harsh rolling stock environments and is fully compliant to EN 50155.

## Technical Specification

### PHYSICAL DATA

<b>Fast Ethernet connectors</b>	M12, female, D-coded
<b>Host connector</b>	PC/104, J1/P1, J2/P2 optional

<b>Maintenance port connector</b>	Header, 10-pin
<b>Visual indicators (LEDs)</b>	Ethernet: link, activity
<b>Power supply voltage range</b>	5 V DC nom.

<b>Power consumption</b>	<4.5 W
<b>Overall dimensions</b>	95.89 × 90.18 × 16.5 mm
<b>Weight</b>	112 g
<b>Operating temperature</b>	-40 to +85°C, according to EN 50155; Class TX
<b>Storage temperature</b>	-40 °C to +85 °C
<b>Relative humidity</b>	yearly average ≤75%, 95% for 30 consecutive days max. (EN 50155)
<b>Useful life</b>	20 years, according to EN 50155 Class L4

### COMPLIANCE

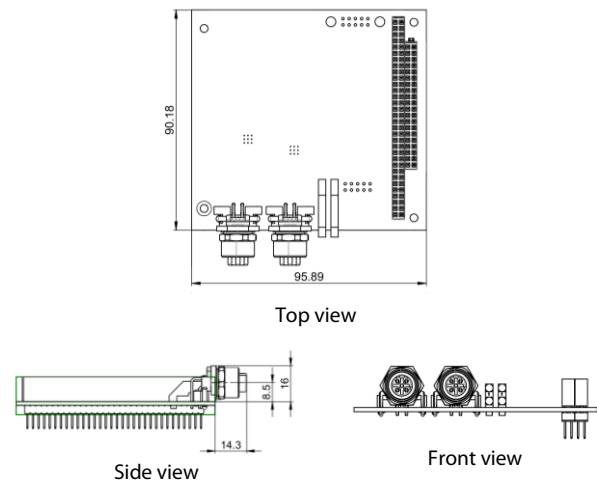
<b>EN 50155</b>	Railway Applications (Electronic equipment used on rolling stock)
<b>EN 50121-3-2</b>	Electromagnetic compatibility rolling stock apparatus
<b>EN 61373</b>	Shock & Vibration
<b>EN 45545-2</b>	Fire protection, HL3
<b>IEC 61375-3-4</b>	Ethernet Consist Network (ECN)
<b>PC/104</b>	PC/104 Specification "Compliant"
<b>RoHS</b>	Restriction of the Use of Certain Hazardous Substances
<b>REACH</b>	Registration, Evaluation, Authorisation and Restriction of Chemicals

### IEEE STANDARDS

<b>IEEE 802.3u</b>	Fast Ethernet (FE)
<b>IEEE 802.1Q</b>	Virtual Bridged Local Area Networks
<b>IEEE 802.1w</b>	Rapid Spanning Tree Protocol (RSTP)
<b>IEEE 802.1X</b>	Port-based network access control
<b>IEEE 802.3ad</b>	Link Aggregation Control Protocol (LACP)

### Dimensions

Dimensions only for reference



### Ordering Information

Product: **D153E - I - N - N - A - N - 2V -** Example: **D153E-I-N-N-A-N-2V<sup>1</sup>**

<b>Ethernet Interface 1<sup>2</sup></b> TCP/IP, UDP Sockets <b>I</b> IPTCom <b>B</b> EtherNet/IP-CIP <b>C</b> CIP Scanner Light <b>CSL</b> PROFINET* <b>R</b> RDA-RT <b>RDA</b> TRDP <b>TR</b> TRDP with SDTv2 <b>TRS</b>	<b>Ethernet Interface 2<sup>2</sup></b> None <b>N</b> TCP/IP, UDP Sockets <b>I</b> IPTCom <b>B</b> EtherNet/IP-CIP <b>C</b> CIP Scanner Light <b>CSL</b> RDA-RT <b>RDA</b> TRDP <b>TR</b> TRDP with SDTv2 <b>TRS</b> Ring <sup>3</sup> <b>O</b> Daisy Chain w. Relays <sup>3</sup> <b>OR</b>	<b>Web Services<sup>4</sup></b> None <b>N</b> Alstom <b>AWM</b> Siemens* <b>SWM</b>	<b>Ethernet Connectors</b> Angled <b>A</b> Straight <b>M</b> 2x5 Sockets <b>S</b> 2x5 Sockets LP <b>D</b> 2x5 Header <b>P</b> 2x5 Sockets C-Grid <b>L</b>	<b>Miscellaneous Options: (Add all characters that apply)</b> With 64-pin AND 40-pin PC/104 con. <b>2</b> PC/104 no stack-through pins <b>X</b> Light Guides for ACT/LINK <b>V</b>	<b>Front Bezel</b> With <b>FB</b> Without <b>N</b>	<b>Ethernet Options</b> None VLAN Support <b>VL</b>
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<sup>1</sup> default ordering options

<sup>2</sup> TCP/IP, UDP Ethernet Sockets is available on all interfaces

<sup>3</sup> Rapid Spanning Tree Protocol (RSTP) is also included with this option

<sup>4</sup> duagon's web server is always included

\* Please contact duagon for availability and lead times

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