

General Features

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 three 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 mal-

function of the D153E.

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.

The interface card integrates the magnetics with a galvanic isolation of 1.5kVrms, 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 8bit 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.

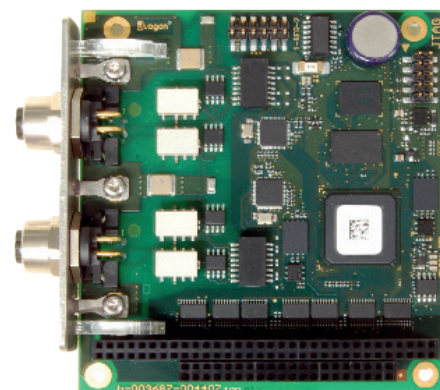
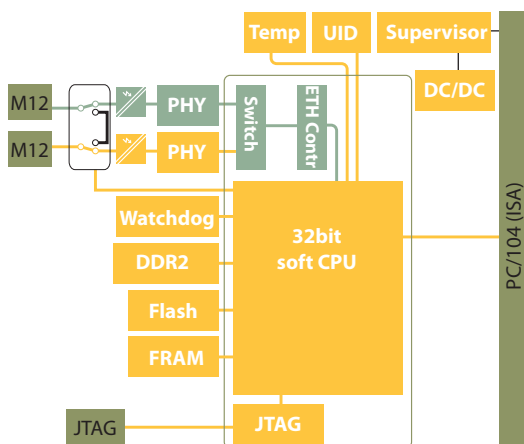
Key Benefits

- Hardware prioritisation within the duagon's own Ethernet controller
- Proprietary high-performance UDP Stack (optimised for cyclic process data telegrams)
- Ring topologies with optional on-board bypass relays and integrated three-port switch
- Encapsulation of real-time Ethernet protocol stacks
- Freeing CPU power on the Host System
- Fully compliant to EN50128, EN50129, IEEE 802.3, EN 50155, EN 50121, IEC 61373 and IEC 61375

Application Examples

- Generic Ethernet interface for various real-time protocols
- Ring topologies without external switches

D153E Hardware Architecture



Life Cycle Cost

Total cost of ownership was an important aspect when creating the installation, maintenance and service concept. The integrated switch (optional) reduces the number of needed

additional switches to build redundant topologies. Further, to avoid service expenses, the interface card has strictly been designed without the usage of electrolytic capacitors.

Technical Data

CPU base System	<ul style="list-style-type: none"> – 32bit soft-CPU (FPGA) – 128MB DDR2 Memory – 32MB Flash Memory – 1Mbit FRAM – Temperature sensor – Watchdog
Ethernet Interface 1 + 2	<ul style="list-style-type: none"> – Galvanical isolation to internal logic – Fully compliant to IEEE 802.3 and IEC 61375 – Integrated three-port switch (optional) – Bypass relays (optional)
Ethernet Protocols	<ul style="list-style-type: none"> – Optimized TCP/IP, UDP Stack (IGMP, DHCP, ICMP, ARP support) – CIP (EtherNet/IP) – TRDP – IPTCom – PROFINET I/O Device – Different Webservers – FTP
Host Interface	<ul style="list-style-type: none"> – Parallel interface, 8 bit UART emulation, compliant to PC/104 standard – 5.0V tolerant IO
Supply Voltage	<ul style="list-style-type: none"> – Single power supply – 5.0V

Diagnostic/Service	<ul style="list-style-type: none"> – Device status information/identification readable through host interface – Firmware update via Ethernet – Temperature sensor on board for temperature supervision – JTAG and serial line available
Power Consumption	<ul style="list-style-type: none"> – P_{max} : <4.5 W
Operating Conditions	<ul style="list-style-type: none"> – Ambient temperature: <ul style="list-style-type: none"> – 40 to +85 °C (EN 50 155) – Relative humidity: <ul style="list-style-type: none"> – 75%, max 95% for 30 days per year (conformal coating) EN 60 068 – Shock and vibration: <ul style="list-style-type: none"> – According to IEC 61373 category 1, class B – EMI: <ul style="list-style-type: none"> – According to EN 50 121 and EN 50 155
Dimensions/Weight	<ul style="list-style-type: none"> – 96 × 90 × 20 mm – <120g
Environment	<ul style="list-style-type: none"> – Fully compliant to RoHS and REACH – 100% 48h cyclic climatic testing

d-015472-038377

Order Code and HW Options

Product Type: **D153E** - - - - -

EXAMPLE: D153E-R-OR-SWM-A-FB-2V

Ethernet Interface 1	Ethernet Interface 2	Web Services	ETH Connector	Front Bezel	Connector and other Options
TCP/IP, UDP	I none	N none	N Angled	A with	FB defaults
EtherNet/IP - CIP	C TCP/IP, UDP	I duagon	dWM Straight	M without	N With 64-pin and 40-pin PC104
TRDP	TR EtherNet/IP - CIP	C Alstom	AWM 2x5 socket	S	PC104 no-stackthrough pins
IPTCom	B TRDP	TR Siemens	SWM 2x5 socket	LPD	Light Guide for "ACT/LINK"
PROFINET	R IPTCom	B 2x5 socket	Lo	L
CIP Scanner light	CSL PROFINET	R			
RDA-RT	RDA CIP Scanner light	CSL			
	RDA-RT	RDA			
	Daisy Chain/Ring	O			
	D. Chain/Ring with Relays	OR			

Related Documents

Data Sheet D153E  d-015569-nnnnnn.pdf
available at www.duagon.com

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