

General Features

The D013E is a multi-purpose dual Ethernet controller interface with embedded processing power. The integrated Ethernet controllers, designed by duagon, feature hardware prioritisation and very low jitter. The chip-sized, space-saving component encapsulates all Ethernet relevant functions on a small 48 x 50 mm size footprint. It can be considered to be a communication chip that handles various Ethernet protocols. The D013E lowers the requirements to the host system, as there is no need for additional CPU power for the Ethernet stack. Moreover, the main application does not need to share CPU power with complex Ethernet protocol stacks.

The D013E is fully compliant to IEEE 802.3 and supports features like Auto Polarity, Auto Negotiation and Auto-DI-X.

The D013E is prepared for the future "Ethernet on traction vehicles" standard IEC 61375-3-4. It supports various Ethernet protocols like TRDP, CIP, IPTcom, Profinet, UDP or TCP/IP. Different kinds of web services are optionally available. An optional internal switch allows to build daisy chains and

to run the appropriate ring protocols. The drivers for the bypass relays are also included. (Bypass relays themselves are not included)

The component integrates the magnetics with a galvanic insulation, the PHY, the complete protocol controller and a simple host interface.

With duagon's driver kit the D013E, 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 D013E does not need a wide address range compared with a solution based on dual ported memory. Different host interfaces like serial (RS/TX), 8bit-parallel or SPI are configurable by bootstrapping pins.

The digital interfaces acts on 3.3V logic levels fitting most of the modern CPU platforms.

The D013E is designed for harsh rolling stock environments and is fully compliant to EN 50155.

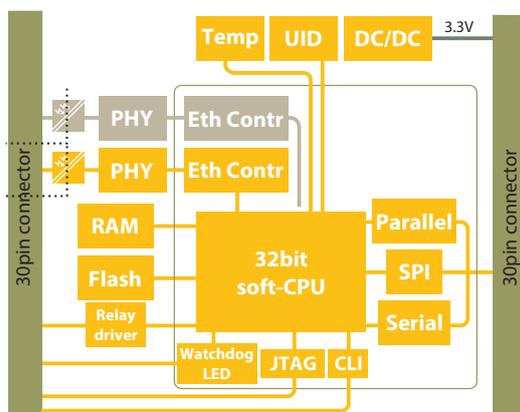
Key Benefits

- Hardware prioritisation within the duagon own Ethernet controller
- Proprietary high-performance UDP Stack (optimised for cyclic process data telegrams)
- Line redundancy handling
- Encapsulation of real-time Ethernet protocol stacks
- Freeing CPU power on the host system
- Space-saving through miniaturized form factor (48 x 50 x 10 mm)
- Fitting modern CPU platforms - powered by 3.3V
- Fully compliant to IEEE 802.3, EN 50155, EN 50121, IEC 61373 and IEC 61375

Application Examples

- Generic Ethernet Interface for various real-time protocols

D013E Hardware Architecture



Evaluation Kits D205E / D206E

This evaluation kit allows the development of the host software using either the serial or the parallel interface. The delivered adapter card, enables the mounting of any D013E. A

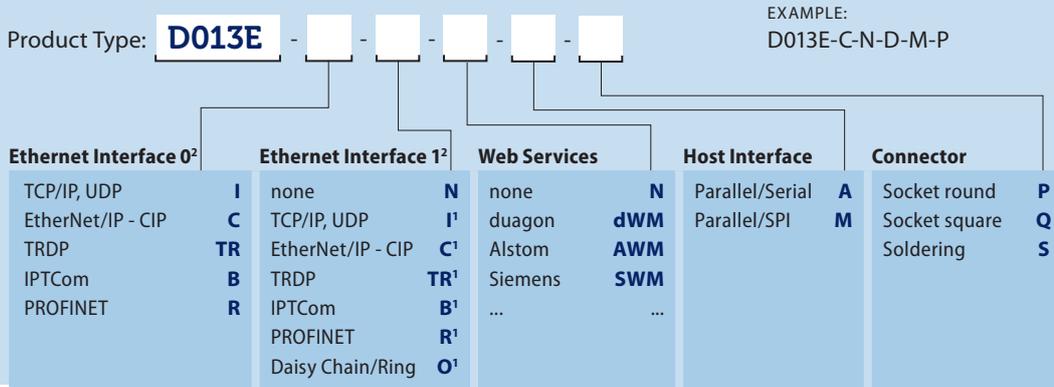
reference schematic and software examples help to speed up the integration time.

Technical Data

CPU base System	<ul style="list-style-type: none"> – 32bit soft-CPU running at 75MHz (FPGA) – 128 MB RAM – Flash file system 	Diagnostic/ Service	<ul style="list-style-type: none"> – Different web services and web monitoring tools are available. Please ask duagon about the possibilities – Device status information/identification readable through host interface – Temperature sensor on board for temperature supervision
Ethernet Interface 0 + 1	<ul style="list-style-type: none"> – Galvanical insulation to internal logic – Fully compliant to IEEE 802.3 and IEC 61375 	Power Consumption	<ul style="list-style-type: none"> – P_{max} : <2 W
Ethernet Protocols	<ul style="list-style-type: none"> – Optimized TCP/IP, UDP Stack (IGMP, DHCP, ICMP, ARP support) – CIP (EtherNet/IP) – TRDP – IPTCom – Profinet RT I/O Device up to CCB – Webserver – FTP 	Operating Conditions	<ul style="list-style-type: none"> – Ambient temperature: <ul style="list-style-type: none"> – 40 to +85 °C (EN 50155) – Relative humidity: <ul style="list-style-type: none"> 75%, max 95% for 30 days per year (conformal coating) EN60068 – 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 50121 and EN 50155
Host Interface	<ul style="list-style-type: none"> – Parallel interface, 8 bit UART emulation – Serial interface, asynchronous – SPI (up to 6MHz clocking) 	Dimensions/ Weight	<ul style="list-style-type: none"> – 50 × 48 × 10 mm – <20 g
Supply Voltage	<ul style="list-style-type: none"> – Single power supply – 3.3V 	Connector types	<ul style="list-style-type: none"> – Soldering connectors – Socket connector with round or square pins
		Environment	<ul style="list-style-type: none"> – Fully compliant to RoHS and REACH – 100% 48h cyclic climatic testing

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Order Code and HW Options



¹Interface two is optional

² Ethernet "Sockets" is included on all interfaces

Related Documents

Data Sheet D013E  d-009076-nnnnnn.pdf
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