

General Features

The D521, D522 and D523 are IEC 61375 WTB Gateways. They are built with two WTB medium attachment units (MAU), which allow the physical connection to the train bus. Line A and B interfaces are galvanically isolated (enabling cable redundancy) and use standard DSUB9 type connectors. To overcome contact oxidation, the WTB Gateways have an optional built-in fritting mechanism. The integrated WTB controller, realized in an FPGA with duagon IP, can be configured to act as a strong or weak master or as a slave. The UIC 556 mapping server, is running on a high performance ARM[®] Cortex[™]-A8 processor.

The consist network is selectable out of either MVB, Ethernet or CAN. An on-board controller handles all the traffic on the consist network as well as complex protocols.

Additionally, the D521, D522 and D523 offer 8 digital inputs and 8 combined input/output channels. The output channels offer an optional output read back functionality for implementing safety relevant applications. All inputs can be con-

figured as high current inputs (HCI). This feature can be enabled by the application software.

A built-in supervisory mechanism called «Condition Monitoring» can detect and record any off-limit usage, such as overcurrent, overtemperature, etc. as well as selected user-defined values. The service interfaces, through Ethernet and USB, offer quick access to these diagnostic informations and all the recorded data.

Developing the train management application is done easily and time-saving by one of the five methods defined by IEC 61131. The application can either be downloaded through the Ethernet or the USB interface.

The WTB Gateways are connected directly to the train battery and support all voltage types from 24 to 110Vdc. Moreover they have a build-in power save mode.

D521, D522 and D523 are designed for harsh rolling stock environments and are fully compliant to EN 50155.



Key Benefits

- Fritting without additional DC/DC converters
- Configurable strong master, weak master and slave node
- Cable redundancy Line A and Line B
- Flexible consist network choice
- Small form factor
- «Condition Monitoring» for detailed diagnostics through USB, Ethernet and the train busses
- Complies to EN 50155, EN 50121, IEC 61375, IEC 61131
- IEC 61131 for fast and easy application programming

Life Cycle Cost

The use of an FPGA with included duagon own soft-IP minimizes the risk and costs in case of component obsolescence. Data access and firmware updates are easily done through a

service interface or directly via one of the available train buses. Further, to avoid service expenses, the Gateways have strictly been designed without the usage of electrolytic capacitors.

Technical Data

Input Voltage	<ul style="list-style-type: none"> - 24 Vdc to 110 Vdc, galvanically isolated - Reverse polarity, overvoltage and overtemperature safe
Processor System	<ul style="list-style-type: none"> - 32Bit ARM® Cortex™- A8 running up to 600 MHz - 256 MByte DDR2-RAM, 64 kbit FRAM - RTC - 1 GB SLC flash file system
Fieldbus Connections / Protocols	<ul style="list-style-type: none"> - MVB SUB-D, EMD or ESD+ up to Class 4 - ETH M12 10/100 Mbit/s (Profinet, IPTcom/TRDP, CIP, TCP/IP, UDP), IEEE 802.3 - CAN SUB-D, (CAN, CANopen Master/Slave)
Programming	<ul style="list-style-type: none"> - IEC 61131 compliant executor and IDE supporting LD, FBD, ST, IL and SFC
Security/ Watchdog	<ul style="list-style-type: none"> - Off-chip Watchdog - External supervisor for voltage and temp monitoring «Condition Monitoring»
Diagnostics/ Service	<ul style="list-style-type: none"> - Ethernet 10/100 Mbit on RJ45 (only diagnostics and service), DHCP - Webserver for diagnostics and control - USB 2.0 high-speed OTG Type miniAB connector for easy monitoring - Diagnostic LEDs indicating power, system OK, Ethernet-, USB-, consist network activity, I/O status
WTB Interface	<ul style="list-style-type: none"> - IEC 61375 compliant WTB Controller - Data Rate: 1 Mbit/s - Strong Master, Weak Master and Slave software configurable - Full support of HDLC frames

Duplicate MAU's	<ul style="list-style-type: none"> - Galvanically isolated MAU for each line (realized with digital isolators) - Dual transceiver for both directions - Protected against overvoltage and short circuit
Fritting	<ul style="list-style-type: none"> - Fritting source and fritting load on each line
Input Channels	<ul style="list-style-type: none"> - 8 current sink input channels with wetting and switching current circuit - HCI inputs with 10 mA sink current
Output Channels	<ul style="list-style-type: none"> - 8 high side (FET) from battery voltage - Read back function - Output short circuit protection - Maximum nominal load current: 1 A
Operating Conditions	<ul style="list-style-type: none"> - Ambient temperature: <ul style="list-style-type: none"> - 40°C to +70°C (EN 50155) - Relative humidity: 75%, max 95% for 30 days per year (conformal coating) EN 60068 - Shock and vibration: According to IEC 61373 category 1, class B - EMI: According to EN 50121 and EN 50155
Mounting	<ul style="list-style-type: none"> - DIN Rail - 3U Rack Cassette - Anywhere (4 screw holes)
Physical Characteristics	<ul style="list-style-type: none"> - Housing: Metal, IP30 protection - Dimensions: 147 x 100 x 120 mm - Weight: < 2.0 kg

d-006792-029441

Order Code and HW Options

EXAMPLE: D521-1-64-O-H-HV-UIC-PMB-T-M3-W

Product Type:	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Consist Network	File System	FRAM	I/O	Fritting	Battery Voltage	UIC Layer	Protocol	HW Int.	DSUB Bolt	Mount					
MVB 521*	1 GB	1 64 kb	64 8/8	O yes	H 24 Vdc 36-48 Vdc 72 Vdc 96-110 Vdc	LV MV* EV* HV	yes UIC Process Data + Message data + Bus Administrator TCP/UDP Sockets IPTCom TRDP PROFINET EtherNet/IP - CIP CANopenSlave CANopen Master	EMD ESD+ I B TR R C OS OM	T D M3 M3 N M3 M3	Wall DinRail 3U W D 3U					
ETH 522*															
CAN 523*															

*Contact duagon for lead times and availability

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Related Documents available at www.duagon.com

Data Sheet D521  d-006097-nnnnnn.pdf
Data Sheet D522
Data Sheet D523