duagon®
TCN / TCMS Solutions

ionia

ARM® Cortex™-A8 based CPU module | i101

General Features

The central unit i101 is the core of all MVB-ionia™ systems. The space-saving form factor allows the design of a compact train controller unit.

Huge processing power for any application is provided by the integrated high performance ARM® Cortex™-A8 processor (core speed of up to 800 MHz) and 256 MB DDR2-SDRAM. Accessing the train bus MVB is done directly, without any additional card.

The module offers a fast and secure point-to-point connection with a maximum of 10 (optionally 27) extension modules (power, input/output or communication). In this way, small and large train applications (I/O count) can be addressed easily with one central unit.

A built-in supervisory mechanism called «Condition Monitoring» can detect and record any defined device status, such as overtemperature, overcurrent, etc. as well as selected user-defined values.

The service interfaces, through Ethernet and USB, offers quick access to diagnostic information and all recorded data.

Developing the train management application is done easily and time-saving by one of the five methods defined by IEC 61131.

The i101 is designed for harsh rolling stock environments and is fully compliant to EN 50155.

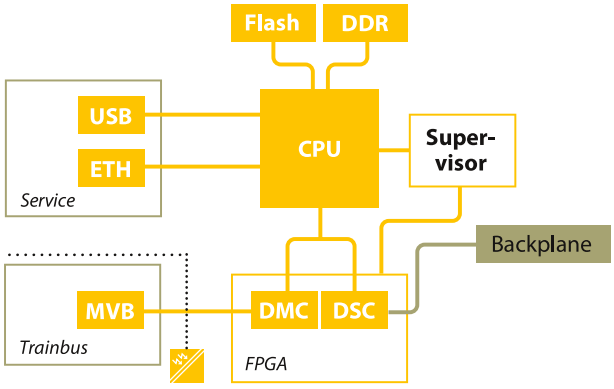
Key Benefits

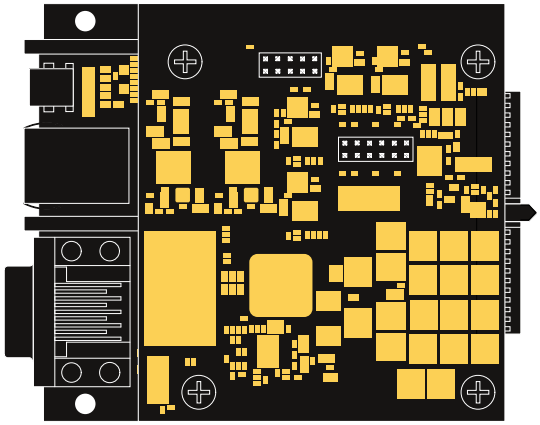
- Complex applications running on a high-performance 32bit ARM® processor
- 100Mbit «Serial Star Controller»: no need for physical module addressing
- Up to 10 (optionally) 27 extension modules
- Flash file system with up to 2GB
- IEC61131 for fast and easy application programming
- Detailed diagnostics through ETH
- Complies to EN 50155, EN 50121, IEC 61375, IEC 61131

Application examples

- Real-time Vehicle Control Unit
- TCN gateway management
- HVAC controller
- Compact coach controller
- Door controller unit
- Toilet controller unit
- Ambient light controller
- Multiple communication gateways
- Driver machine interface

i101 Hardware Architecture





Life Cycle Cost

The i101 has strictly been designed without electrolytic capacitors to avoid service cost for changing capacitors. To avoid periodical service cost the module can be shipped without any battery. 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.

Technical Data

Processor System	– 32 Bit ARM® Cortex™- A8 running at up to 800 MHz – 256 MB DDR2-RAM – 64 kbit non volatile memory for remaining data (up to 1 Mbit available) – 32 MB boot flash memory – 1 GB SLC flash file system (2 GB available) – RTC with minimum 10 years battery life time
OS	– Realtime Linux
MVB	– Up to Class 4 according to IEC61375 – 4096 Process data ports – Message data handling fully compliant to IEC61375 – Full featured Bus Administrator/Master – Physical layer: EMD or ESD+ – Integrated 120 Ω termination resistance – Two 9 pole DSUB (male/female) – Free selectable UNC or M3 Bolt
Programming	– IEC 61131 compliant executor and IDE supporting LD, FBD, ST, IL and SFC – Firmware download through service interface – Firmware upgrade through fieldbus activatable by customer
Security / Watchdog	– Off-chip Watchdog – External supervisor for voltage and temp monitoring → «Condition Monitoring»

Backplane Communication	– 100 Mbit duagon serial star controller for connecting up to 10 (optionally 27) modules – Communication Link with watchdog supervision – Configurable IO scan cycle time minimum: 1 ms
Diagnostics/ Service	– Ethernet 10/100Mbit 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, ETH-, consist network activity
Power Consumption	– P_{max} < 8 W – Power supply via backplane – Interruption Class S2 with ceramic capacitors
Operating Conditions	– Ambient temperature: –40 to +85 °C (EN 50155) – Relative humidity: 75%, max 95% for 30 days per year (conformal coating) EN 60 068 – Shock and vibration: According to IEC 61373 category 1, class B – EMI: According to EN 50121 and EN 50155
Dimensions/ Weight	– 8HP x 109.8 × 97.2 mm – <290g
Environment	– Fully compliant with RoHS and REACH

d-012130-020839

Order Code and HW Options

Product Type: **i** - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐

EXAMPLE:
i101- 1-64k-U-N-PM-T-UNC

Consist Network	File System	FRAM	MINI-USB	Battery	Protocol	HW Int.	DSUB Bolt
MVB i101	1 GB **1**	64 kbit **64k**	USB **U**	Yes **Y**	Process Data **P _ _**	EMD **T**	UNC **UNC**
	2 GB* **2**	256 kbit* **256k**	no **N**	no **N**	Message Data **_ M _**	ESD+ **D**	M3 **M3**
		1 Mbit* **1M**			Bus Administrator **_ _ B**		

*Contact duagon® for lead times and availability

Related Documents

Data Sheet i101 d-007121-nnnnnn.pdf | available at www.duagon.com

Configure ionia™ online:

duagon AG
Riedstrasse 12
CH-8953 Dietikon
Phone +41 44 743 73 00
Fax +41 44 743 73 15