# SIMBA

D-ORBIT COMMAND & CONTROL UNIT

Simba is a lightweight, cost-effective, and versatile onboard computer for platform management and general-purpose applications. It features redundant interface to spacecraft data bus, a companion Microsemi RTSX32SU FPGA for customized applications and a qualified RTEMS software suite.

Qualified for long-lasting LEO mission, Simba is based on a reliable and flight-proven LEON3-FT SPARC V8 core by Cobham Gaisler (GR712RC). It can be used for attitude determination and control systems (ADCS), telemetry and telecommand (TMTC), platform health monitoring, payload processing services, and for any other subsystem that requires processing capabilities.

GENERAL FEATURES

- Dual-Core LEON3-FT SPARC V8 Processor, 16 kB multi-way instruction cache and 16 kB multi-way data cache. 107 DMIPS @ 80 MHz.

  FLASH memory: 16Mbyte organized as 4 Mbit x 32.

- RAM memory: 2,5 Mbyte SRAM organized as 512 Kbit x 40.

- ECSS Class-1 components, lower-quality components version available.

- Qualified RTEMS operating system with optional time and space partitioning system.

- Configurable FPGA companion for custom applications.

- Featuring in-flight software maintenance and reprogramming.
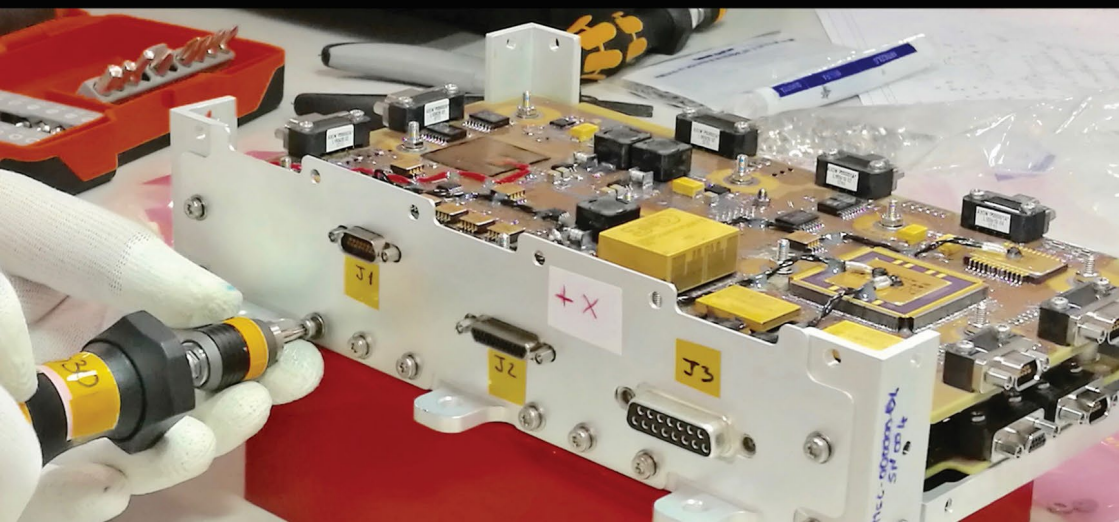
POWER

- 28V unregulated DC input power.
- < 15W power consumption.
- Internal DC/DC power conversion and regulation available to external units (max 80 W cumulative on all external lines).
  - One switchable 28 V regulated DC channel (max 55 W) with three outputs.
  - One switchable 12 V regulated DC channel (max 50 W) with one output.

MECHANICAL

- Dimensions: 166x220x49 mm.
- Mass: 1.2 kg.
- Mechanical interface: 6 x M4 screws, accessible from top and bottom.

INTERFACES

- Two redundant MIL-STD-1553B, replaceable with CAN BUS in assembly phase.
- Four RS-422 Interfaces (UART also for debugging and development).
- SPI with up to six slave-select available.
- Nine analog channels (12-bit ADC) and five opto-isolated GPIO.
- TMTC Interface with ECSS CCSDS protocol.
- ECSS CCSDS Time synchronization and distribution.
- JTAG for software maintenance.

ENVIRONMENTAL SPECIFICATIONS

- Temperature range: -35°C to + 60°C.
- Radiation:
  - 40 krad (Si) TID (excluding shielding).
  - Compliant with 10 years LEO.
  - SEU tolerant, latch-up immune.
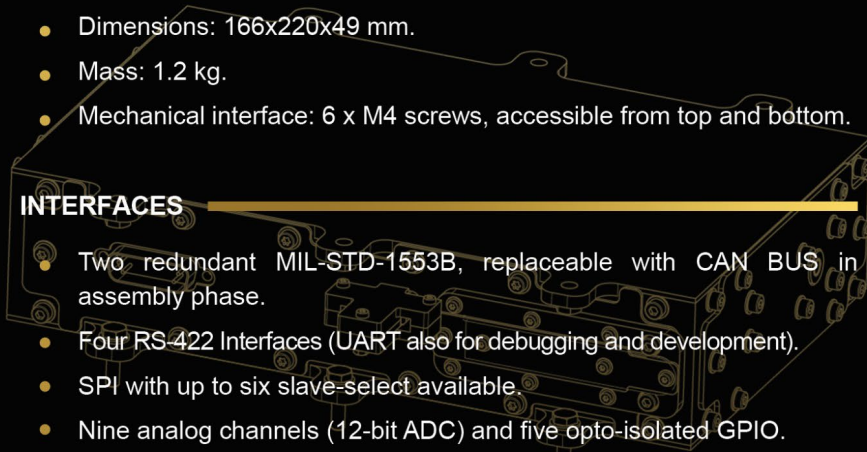
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