SERVICIOS TECNOLÓGICOS INTEGRADOS S.R.L.

STI-OBC-700

RAD HARD CPCI BASED ON BOARD COMPUTER FOR SATELLITES

DESCRIPTION

The STI-OBC-700 is an On-board Computer (OBC) for SABIA-Mar payload module specifically designed to meet subsystem specific requirements.
These requirements are mainly large count of high-speed interfaces, and sensing of voltage, current and temperature inputs.

The proposed architecture is based on a Leon3FT processor on a cPCI bus. The microprocessor (placed on a main board) controls and monitors the different specialized boards that perform the acquisition of signals and counts on the interfaces to manage the payload module.

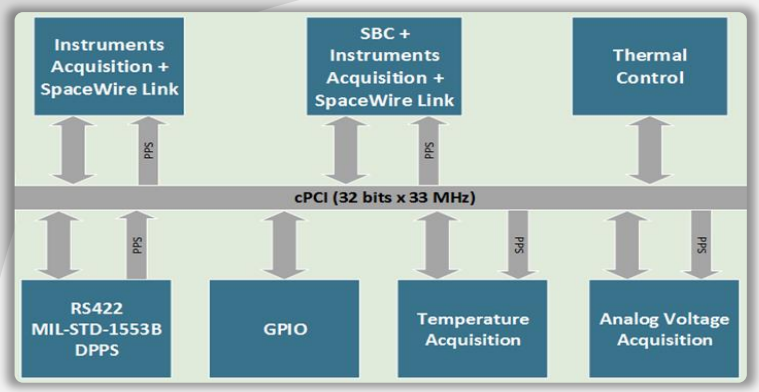
- The OBC housing outline is LxWxH: 380 mm x 240 mm x 240 mm.
- The CBE mass is 18 kg.
- This configuration includes a nominal and a redundant OBC within a common housing.

FEATURES

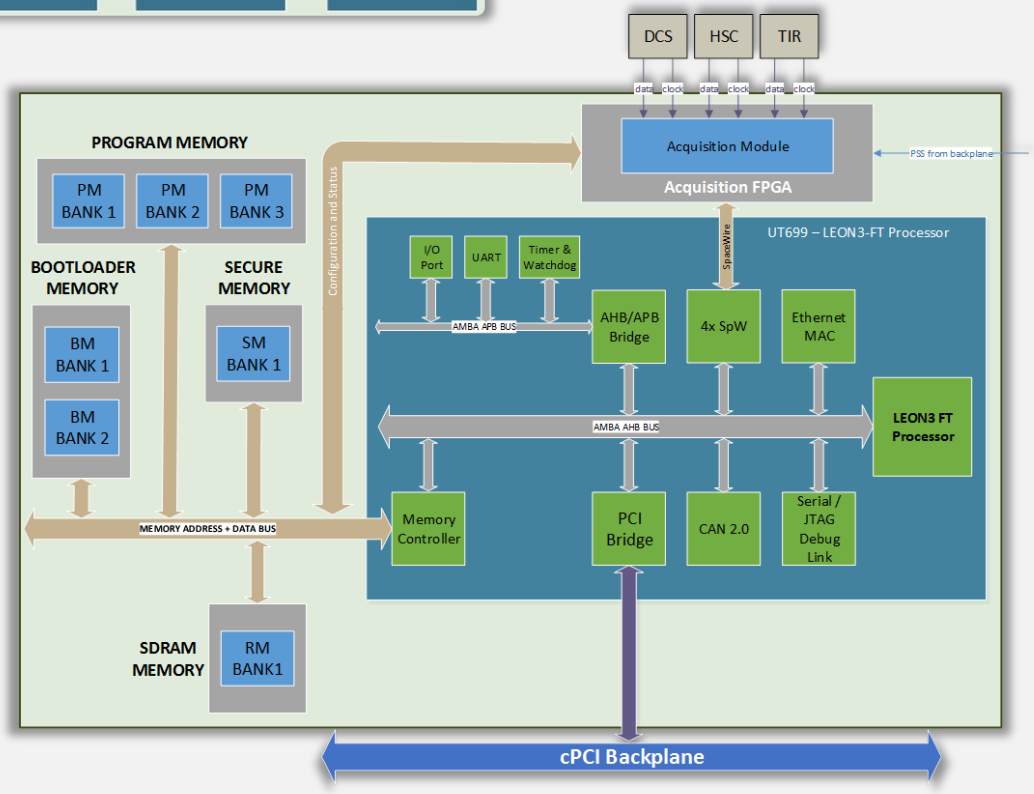
- **1 Processor board with:**
  - LEON3-FT 32-bits processor, fault-tolerant version, with 2 x 4 Kbytes data and instruction cache, FPU and MUL/DIV hardware units.
  - 4 SpaceWire channels with two supporting RMAP.
  - 10/100 Base-T Ethernet MAC.
  - 2 CAN-compliant 2.0 bus interfaces.
  - 1 UART interface.
  - 3 Timers units and one watchdog
  - 16-bit general purpose I/O port (GPIO) which can be used as external interrupt sources.
  - Multifunctional memory controller.
  - Interrupt controller for 15 interrupt sources in two priority levels.
- Memory banks:
  - Bootloader memory, where the booting code is stored.
  - Program memory, where the user application is stored.
  - Secure memory, where non-volatile user data is stored. A protection mechanism is implemented, inhibiting any “single write” operation instruction to modify the memory contents. Valid write operations are done using a specific signalling protocol.
  - RAM memory, where volatile data is stored.
- PCI Master interface with 8-channel arbiter.
- Performance: 1.2 DMIPS/MHz.
- Máximum power consumption: 35W.
- NASA class 2 parts.
- BSP and drivers for RTEMS real-time operating system.

- **1 RS422 & 1553 & DPPS Board with:**
  - 2 MIL-STD-1553B interfaces.
  - 4 UART/RS422.
  - 1 PPS detector master.
  - 1 PCI Slave.
- **2 Acquisition boards with (each):**
  - Up-to 5 Serial 422.
  - 2 SpaceWire interfaces.
  - 30 GPIO.
  - 3 UART/RS422.
  - 1 PCI Slave.
- **1 Voltage Acquisition Board with**:
  - 100 analog differential input lines.
  - 1 PCI Slave.
- **1 GPIO Board with**:
  - 36 diff. opto-coupled inputs.
  - 36 diff. opto-coupled ouputs.
- **1 Temperature Acquisition Board with**:
  - 100 dedicated differential lines for feeding and reading of thermistors.

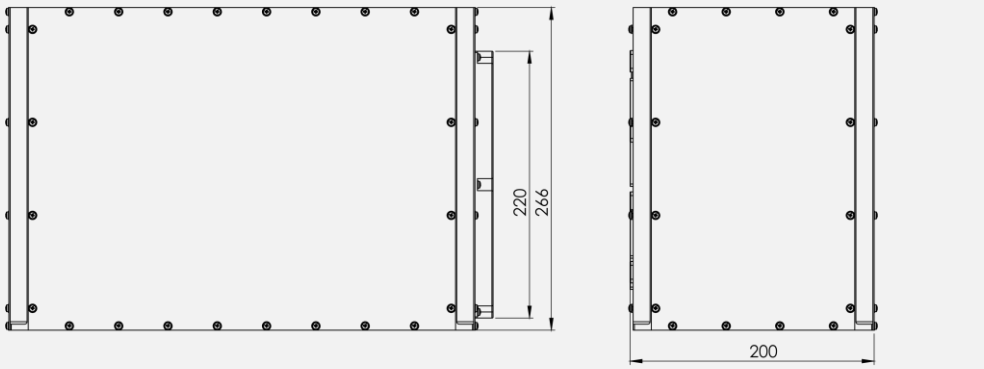
GENERAL BLOCK DIAGRAM



MAIN PROCESS UNIT DIAGRAM



MECHANICAL OUTLINE



(dimensions are in mm)