

Constellation Single Board Computer (cSBC)

The Constellation Single Board Computer is one of the high quality products that offer a cost effective solution for applications deployed in larger quantities. The computer offers a high performance processor and a powerful FPGA for flexibility in terms of communication, interface and processing capability. It can be used for any on board computer on the platform or in the payload.

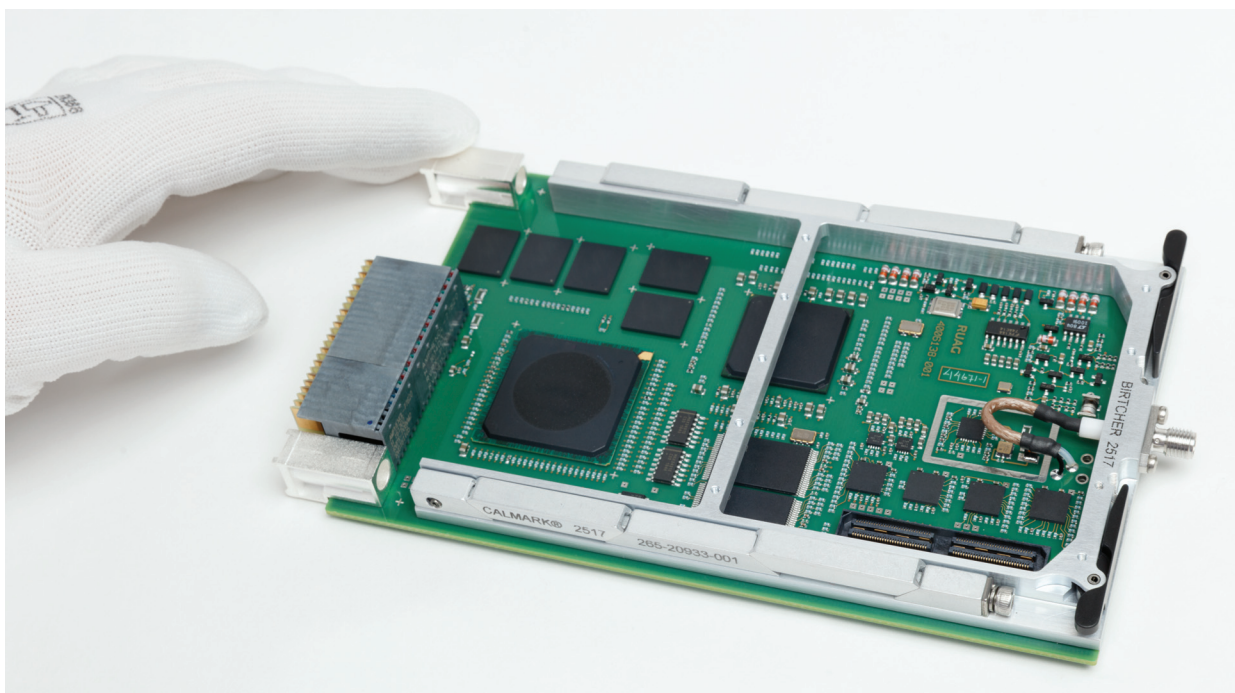


Photo of GPS receiver variant - RUAG Space

Key Features

- 3U conduction cooled SpaceVPX
- Power Architecture © e500Core
 - 1800 DMIPS @ 800 MHz
 - 800 MFLOPS @ 800 MHz
 - 32 KiB L1 instruction cache with parity
 - 32 KiB L1 data cache with parity
- 256 KiB L2 cache with ECC
- 512 MiByte DDR processing memory with ECC
- 4 GiByte non-volatile storage with ECC
- 256 MiByte communication memory with ECC
- Gigabit Ethernet Debug Link
- Support for hypervisor software
- Hardware Driver Software
- Software Development Environment
- SmartFusion2 SoC FPGA
 - 86000 DFF and 84 math block
 - Hard PCIe
 - 2Mbit memory
 - Many IO types
- GNSS receiver, GPS/Galileo

Interfaces

Front:

- RF input
- Test & debug
 - Gigabit Ethernet
 - UART

VPX Backplane in GNSS (GPS/Galileo) variant:

- 1 x RS422 UART
- 1 x RS422 PPS out
- 1 x SpaceWire
- Power supply +5V

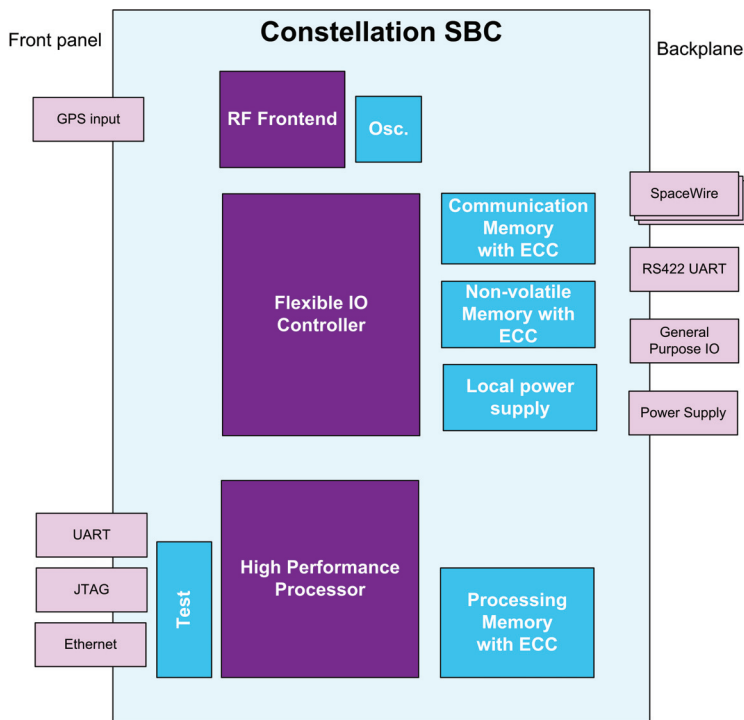
VPX Backplane general signals:

- 32 x LVDS
- 44 x Single ended IO
- Power supply +5V

Software and Development Environment

- Integrated development environment
- Operating system independent boot and driver software
- Cross compiler suite
- Board support packages for operating systems and hypervisors
- Advanced software debug tool chain

Block Diagram



Mechanical & Power

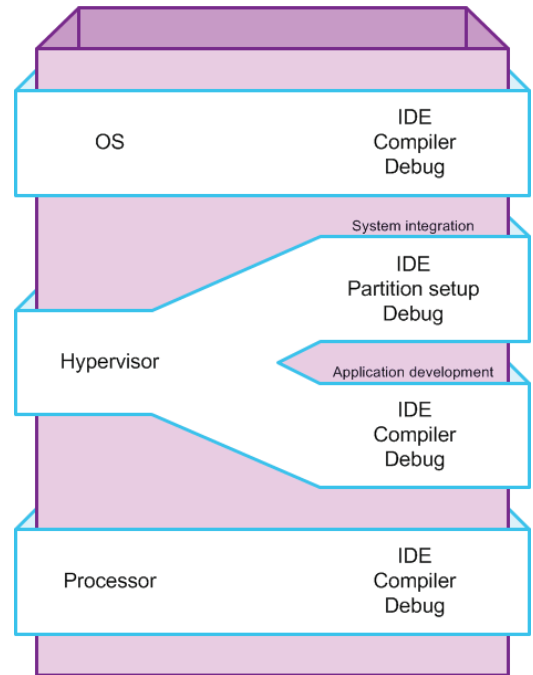
Form factor	3U 100 x 160 mm
Power consumption	< 20 W
Mass	225 g incl. frame

Radiation Tolerant

- Latch Up protected
- All memories with ECC
- Sustain total dose up to 10 years in LEO orbit

Environment

- Temperature -20 to +65 °C
- Vibration Level 0.1 g2/Hz in the range 20-2000Hz
- Shock Level 1400g @ 2000Hz



Hypervisor and Operating System

- VxWorks
- RTEMS
- PikeOS

RUAG Space Heritage

- >2900 failure free equipment years in orbit
- >300 Launcher On-Board Computers
- >120 Satellite Data Handling Systems
- Latest satellites in orbit: Hispasat 36W-1, Göktürk 1A, ExoMars Trace Gas Orbiter