

OBCU-500-NS

Mission agility:
Scale with precision,
adapt with ease



The OBCU-500-NS is a high-performance on-board computer, developed by Airbus Defence and Space to serve the next generation of LEO constellations and beyond.

It rely on the European, rad-hard and powerful System On Chip : NG-Ultra.

As part of the Airbus Unified Avionics Strategy, we seamlessly bridge the gap between the dynamic New Space and the stringent Hi-Rel markets, delivering cutting-edge solutions for the future of space exploration.

Applications

- LEO constellations
- Earth observation missions
- Navigation & telecom platform
- Science & technology demonstration missions
- Institutional or commercial New Space platforms

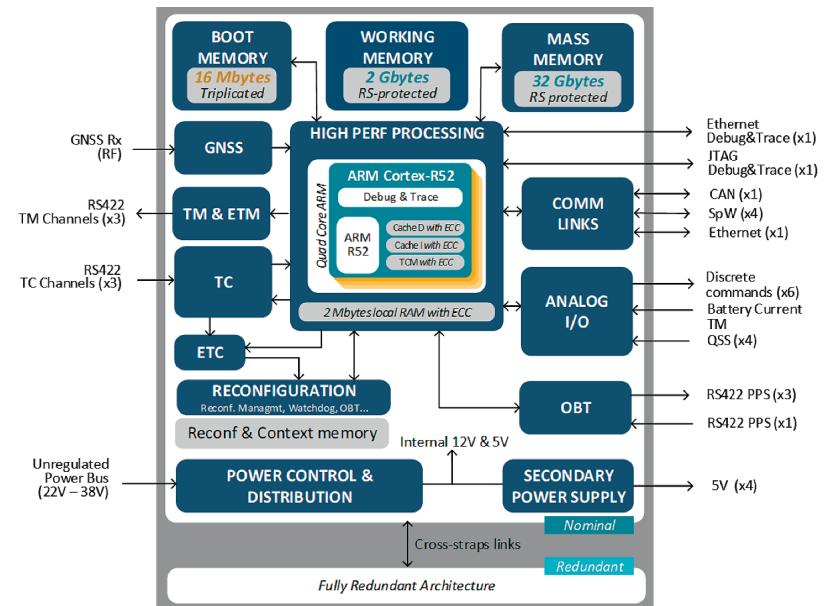
Our advanced avionics system, built upon the heritage of Pureline Amethyst OBC, features an impressive flight heritage, having successfully powered over 630 OneWeb satellites. It relies on the NG-Ultra, a European-developed, rad-hard, and powerful System-On-Chip.

Leveraging the proven in-flight heritage of our predecessor system, which has accumulated more than 2.500 years in orbit, our technology combines high reliability, a compact form factor, and a reconfigurable architecture. This makes it perfectly suited for New Space missions like IRIS² and future constellations.

Technical specifications (with default mezzanine)

- Processor: ARM Cortex-R52 (quad-core) NG-Ultra SoC
- Frequency: 600 MHz
- Performance: 4 × 1250 DMIPS
- Volatile memory: 2 GB DDR4 ECC (93.5 Gbps bandwidth)
- Non volatile memory: 32 GB NAND Flash RS protected by replication
- Non volatile memory: 256kB MRAM triplicated
- Bus Voltage: 22 V – 38 V unregulated
- Interfaces:
 - 4 x SpW (each 100Mbps)
 - 1 x Ethernet (1 Gbps)
 - 1 x CAN (1Mbps)
 - GNSS: GPS / Galileo (E1/L1); 10 channels (10 m 3D rms)
 - TM: 20 Mbps
 - TC: 10 Mbps
- Redundancy: Dual hot-redundant channels
- Delivered with BSP and Boot SW

Functional overview



Extensions & options

The OBCU-500 NS platform calculator is designed for scalability to meet evolving constellation and mission requirements. Thanks to standard mezzanine, additional interfaces can be added (1553, mass-memory extension).

Additional functions can be added thanks to additional boards:

- Additional I/O and discrete command handling
- Extended GNSS (> 30 channels)
- PQC security and hybrid encryption capabilities

Industrialization & roadmap

- Airbus Space Electronics clean-room automated production line
- Fully automated batch production with a capacity of 24 units/month
- Tin-lead & lead-free assembly
- Scalable for high-volume constellations
- Next evolution: High-reliability OBCU-500-HR (LEO-GEO), reusing OBCU-500-NS building blocks

Qualification & standards

- Compliant with ECSS and ESA Category-B SW; BSP & Boot SW
- Production line certified by CNES / ESA
- SpaceWire: ECSS-E-ST-50-12C,
- CCSDS and CDFP for TM/TC
- Ethernet 1000BASE-T: standard IEEE 802.3ab-1999

Architecture overview

Each OBCU-500-NS channel operates in hot redundancy and includes two main functional modules:

- **Digital module:** Processing, reconfiguration, TM/TC handling, OBT, GNSS, and communication interfaces.
- **Analog module:** Power conversion and distribution to external units, current monitoring, and acquisition.

Characteristics

Dimensions	380*250*120 (mm)
Mass	<6kg
TID	35 krad
Lifetime	10 years in LEO

Planned qualification milestones:

- EM - 2027
- EQM & PFM - 2028

With the OBCU-500-NS, Airbus aims to provide the Constellation market with high-performance equipment compatible with strategic needs. For this new product, Airbus can rely on its know-how gained through the OneWeb experience: OBC-Amethyst design legacy and mass production capacity. This ensures high-quality equipment while optimizing both non-recurring and recurring costs.