

FEATHERBOX

ON-ORBIT DATA PROCESSING UNIT



» UNPARALLELED ON-ORBIT EDGE COMPUTING

FeatherBox, a compact Data Processing Unit tailored for AI applications in orbit, redefines space efficiency. Its 0.5U size and low power design ensure seamless compatibility with diverse cubesat platforms. By processing onboard sensor data directly and transmitting only crucial information, FeatherBox slashes downlink costs and significantly bolsters response times for critical events in orbit.

At its core, FeatherBox integrates a robust AI computing module with Sidus Space's rad-tolerant motherboard, operating as a fully-integrated Linux system. Capable of 4 trillion operations per second (4 TOPS) and boasting precision thermal management within its enclosure, it minimizes reliance on external thermal controls. This device combines cutting-edge computing prowess with space-grade reliability, delivering a complete AI payload in tandem with FeatherWare for unparalleled on-orbit edge computing capabilities.



USE CASES

- » EARTH OBSERVATION IMAGE PROCESSING
Enhance image processing capabilities for detailed Earth observation.
- » AUTONOMOUS SATELLITE OPERATIONS
Enable satellites to operate autonomously, streamlining mission tasks.
- » CLOUD COMPUTING
Facilitate cloud-based data processing for space applications.
- » SPACE SITUATIONAL AWARENESS
Contribute to enhanced space surveillance and awareness.
- » DATA STORAGE AND COMPRESSION
Efficiently store and compress data on-orbit.
- » SYNTHETIC APERTURE RADAR (SAR)
Improve radar capabilities for high-resolution imaging in space.

- » Space Efficiency
- » Cost Reduction
- » Rapid Response Times
- » Cutting-Edge Computing
- » Reliability



>> SPECS

INTERFACES	
CONNECTORS	Micro-D
ETHERNET	Data rates up to 1,000 Mbps
USB 3.1 GEN 1	Data rates up to 5 Gbps
2X UART RS-422	Data rates up to 5 Mbps
2X SPI	Data rates up to 52 Mbps
2X I2C	Data rates up to 400 Kbps
8X GPIO	3.3 V
NON-STANDARD	Additional interfaces/ protocols upon request SpaceWire, CAN, etc.

PROPERTIES	
MASS	1.4 kg
SIZE	96 mm x 96 mm x 50 mm
POWER SUPPLY	5 V
POWER CONSUMPTION	3 W Idle, 7.5 W Typical, 22 W Peak (tens of microseconds)
OPERATING TEMPERATURE	-25 C to +85 C
STORAGE TEMPERATURE	-40 C to +85 C

PERFORMANCE	
CPU	Quad Cortex-A53
GPU	2D/3D Vivante GC7000 Lite GPU and VPU
ML ACCELERATOR	Coprocessor: 4 TOPS
RAM	4 GB LPDDR4 SDRAM
STORAGE	40 GB SLC NAND Flash (EDAC) 16 GB eMMC

SOFTWARE	
OPERATING SYSTEM	Linux based
AI/ML MODEL TYPE	TensorFlow Lite
SOFTWARE PACKAGE	Basic Software Package Included

RADIATION PROTECTION	
»	Structural shielding minimizes Total Ionizing Dose (TID) and Single Event Effects (SEE)
»	Multiple software and hardware redundancies and mitigations enhance system resilience
»	Voltage and current monitoring with automatic power cycle capabilities ensure stable operation