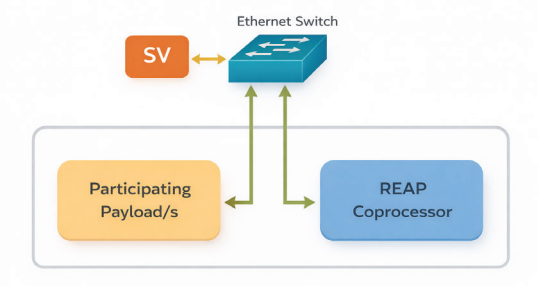
Datasheet

Rapidly Extensible Application Processor (REAP)

Part Number: AE10XXXX-001



The Aeronix Rapidly Extensible Application Processor (REAP) is a space-rated, reconfigurable co-processor designed for demanding parallel computations on orbit. Leveraging multiple GPU modules and Nvidia's software ecosystem, REAP enables fast mission application development and scalable data processing. Its modular architecture supports third-party payloads and applications, with robust communication interfaces for seamless integration with spacecraft systems.



System Qualifications

Size	~1U (19.5 x 11.5 x 5.0 cm)
Mass	1613g
Power	3.13W (Idle), 63.13W (Processing)
Qualification	Thermally & vibrationally qualified to NASA GEVS standards
Flight Heritage	Deployed aboard multiple satellites April 2026
Technology Readiness Level	TRL-9

Available Software

- SIGINT detection, snippet capture, measurement, and characterization
- SIGINT Single Ball Geolocation end-to-end signal processing
- Alt-PNT system for GNSS-denied operation

Engineered Solutions. Delivered.

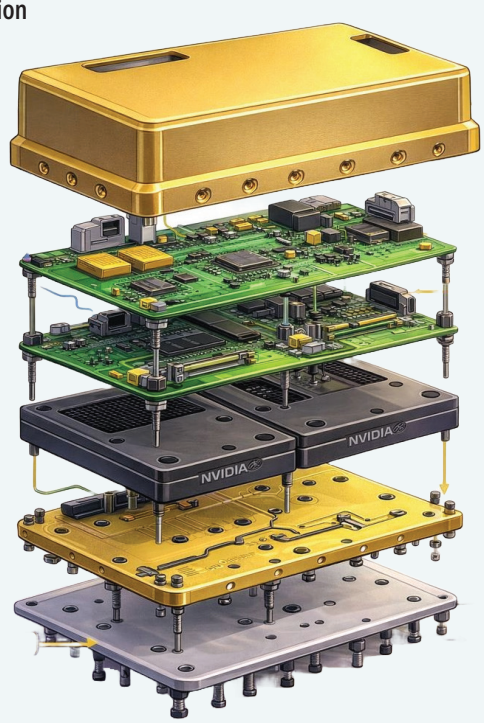
Aeronix offers an extensive line of Engineering Service including the creation and implementation of custom solutions to meet even the toughest requirements.

FEATURES

- Dedicated, scalable GPU-based co-processing for high-performance parallel computations
- Modular design with integrated motherboard and Payload Control Unit (PCU)
- Core Flight Software on Linux 4 Tegra ARM CPU and NVIDIA CUDA GPU architectures
- Radiation fault mitigation: hardened latch-up monitoring, software-based upset mitigation, redundant cold-spare Orin module
- Industry-standard interfaces: Gigabit Ethernet (GbE), GPIO, UART, Tyco Industrial Mini IO (SGMII)
- Robust 6061-T6 aluminum enclosure for space environments
- Onboard PCU supports C2 of connected payloads with single and stored timed commands

Optional Features

- 10 GbE internal pipes to GPU and external interface
- Integral 10 GbE switch
- DRIVE AGX Thor GPU upgrade
- Optional conformal PCB coating for enhanced environmental protection



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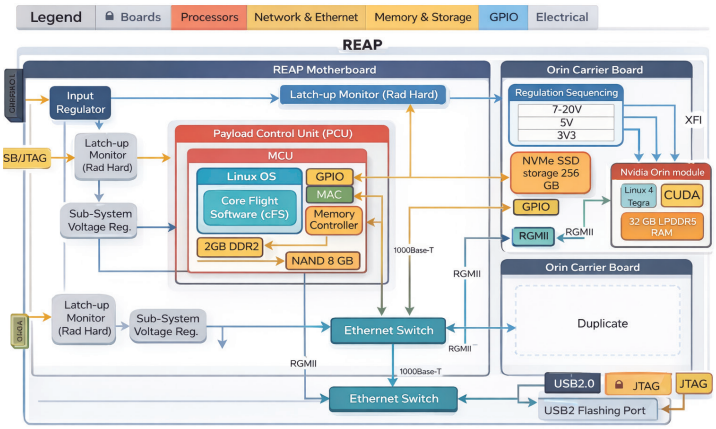

REAP COPROCESSOR SPECIFICATIONS

PROCESSING	
CPU	12-core Arm Cortex-A79AE v8.2 64-bit CPU 2MB L2 + 6MB L3 (2.2GHz Max)
GPU	1048-core NVIDIA Ampere architecture GPU with 64 Tensor Cores (1.3GHz Max)
	- 275 INT8 TOPs
	- 10.6 FP16 TFLOPS
	- 5.3 FP32 TFLOPS
MEMORY	Jetson AGX Orin: 64GB 256-bit LPDDR5 204.8GB/s
	REAP Motherboard PCU: 8GB NAND, 2GB DDR2
STORAGE	Jetson AGX Orin: 64GB eMMC 5.1
	REAP Carrier Board: 256GB NVMe SSD (for each Jetson AGX Orin module)
SOFTWARE	
Linux OS w/ Core Flight Software	
Linux Tegra 4 and NVIDIA CUDA processing modules	
DATA INTERFACES	
25-pin Micro-D: 1000Base-T GbE, GPIO, UART	
Tyco Industrial Mini IO: SGMII Gigabit Network Interface	
POWER	
9-40 VDC unregulated input	
21-pin micro-D power connector contains 9-40V supply and return	
POWER CONSUMPTION	3.15W Motherboard + 60W max per active Jetson AGX Orin module. Orin module features custom, limited power modes 15-60W
PHYSICAL SPECFICATIONS	
REAP Electronics modules encased in robust 6061-T6 enclosure with integrated passive heat sink in Chem Film Yellow finish	
DIMENSIONS	(~1U) 19.5 x 11.5 x 5.0 cm
MASS	1613g w/o cables
OPERATING TEMPERATURE @ PAYLOAD BASEPLATE	25 C to +80 C (survival), -25 C to +73 C (operating)