

MissionCore

One Core. Multiple Payloads.

A MODULAR PAYLOAD ELECTRONICS PLATFORM

Processing, control and data handling – adaptable to mission needs.



MissionCore payload computer

The MissionCore is a compact payload-side processing and control unit for small to medium satellite applications. It combines power conditioning, payload control, data handling and FPGA-based on-board processing in one configurable platform.

Use one common core and adapt the application-specific interfaces for optical payloads, thermal control or mechanisms.

THREE APPLICATIONS. ONE PLATFORM.

VISION NODE

Optical payloads



- Camera control and image capture
- Local storage
- ROI extraction
- Optional FPGA/CNN acceleration

HEATER NODE

Thermal control



- Closed-loop temperature control
- Application-specific heater interface
- Integrated platform housekeeping
- Mission-adaptable configuration

STEPPER NODE

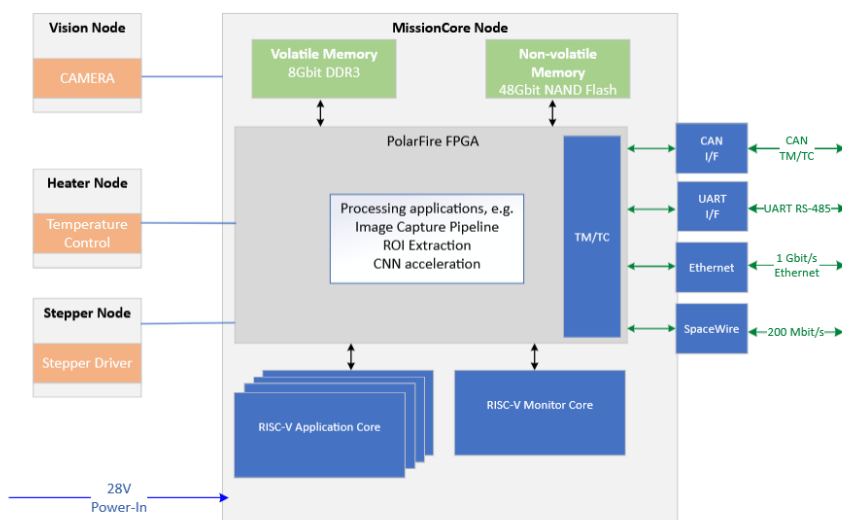
Mechanisms



- Stepper-driver function
- Application-specific mechanism interface
- Integrated platform housekeeping
- Mission-adaptable configuration

MISSIONCORE ARCHITECTURE

One common processing platform – application-specific nodes.



COMMON CORE CAPABILITIES

FPGA On-board processing
RISC-V Application + monitor
MEMORY DDR3 + NAND Flash
TM/TC UART RS-485 / CAN
DATA I/O Ethernet / SpaceWire

EUROPEAN FPGA OPTION

Selected MissionCore configurations can be adapted to use European FPGA technology. Available solutions rely on **Gate-Mate FPGA**.

Supporting European sourcing and technology sovereignty where required by the mission.

Contact

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TECHNICAL SPECIFICATIONS

PROCESSING & MEMORY

Processing cores	Microchip PolarFire SoC 1 × E51 core: RISC-V RV64IMAC, 625 MHz 4 × U54 cores; RISC-V RV64GC, 625 MHz
Hardware acceleration	FPGA fabric for image/vision acceleration, FPGA-based image acceleration
Register width	32-bit
Memory (estimated)	Memory (volatile), 8 Gbit DDR3 (1 GB) Memory (non-volatile) 48 Gbit NAND Flash (6 GB)
Image storage format	10-bit RAW, uncompressed
Camera control	Turn on/off, Trigger picture, Configurable Capture Profile (single vs. multishot)
ROI extraction	Configurable ROI extraction
Housekeeping data (Typical)	Board status and temperature, operational voltages, camera status flags, interface status flags

INTERFACES IN/OUT

Power Connector	Separate power connector (adaptable to mission requirements, typical: 12-28V unregulated)
Communication connector (standard)	UART over RS-485, memory-mapped register access
Camera	Integrated on board (internal interface: MIPI-CSI-2.0), optional external camera interface via Camera Link
CAN	Optional (specific to project), with CSP
SpaceWire	Optional SpaceWire, up to 200 Mbit/s per link for payload data transfer
Ethernet	Optional Gigabit Ethernet, up to 1 Gbit/s for image data, ROI/frame transfer and integration support
Frame downlink	Optional (enable/disable), default output: verification report + housekeeping

MECHANICAL

Dimensions (approximately)	85 (L) x 85 (B) x 20 (H) [mm]
Mass	Approx. 70 g without housing, final mass configuration-dependent

ENVIRONMENTAL & ELECTRICAL

Power consumption	Depending on workload, typical 5 to 20 W (incl. camera)
Operating Temperature (range)	-20 to +50 °C
Vibration	Random vibration: 20-100 Hz: 0.0044, 300-700 Hz: 0.01, 800-925 Hz: 0.03, 2000 Hz: 0.00644 [g ² /Hz]; overall 5.13 grms
Total Ionizing Dose (TiD)	Min. 20 kRAD
Single Event Effects (SEE)	SEU protected memories and SEL protected supply