DATA PROCESSING UNIT

SKAIDOCK Datasheet

OVERVIEW

SKAIDOCK is ZAITRA's onboard data processing platform, a space-qualified Data Processing Unit built around the Xiphos Q8J module and designed for demanding Earth Observation missions. Its payload-agnostic interface suite, spanning CameraLink, LVDS, dual 1 Gbps Ethernet, CAN, and seria, integrates with a wide range of imaging systems without custom development. Combined with ZAITRA's SKAISEN AI software and SKAIPACK compression suite, SKAIDOCK enables complete onboard data intelligence from raw acquisition to prioritized downlink.

FEATURES

- Xiphos Q8J — flight-proven compute module
- Plug-and-play Simera Sense xScape compatibility
- CameraLink, LVDS, dual 1 Gbps Ethernet — payload-agnostic interface suite
- CubeSat-compatible PC104 form factor
- Space qualified — TVAC, vibration, shock, EMC tested

Technical specification

COMPUTE AND MEMORY

SKAIDOCK is powered by the Xiphos Q8J module, integrating an AMD Zynq UltraScale+ XCZU7EG MPSoC and a ProASIC3 supervisor. The system provides 4 GB of LPDDR4 ECC RAM, 2× 256 MB QSPI Flash with 4 redundant system slots, and 2× 128 GB eMMC for high-capacity mission data storage.

INTERFACE SUITE

SKAIDOCK's interface suite is designed for payload-agnostic integration. Two independent 1 Gbps Ethernet ports enable high-throughput data transfer and redundant communication paths. A dedicated connector supports imaging systems using the CameraLink protocol or high-speed communication subsystems. Two CAN interfaces (1 Mbps) provide reliable bus communication with satellite subsystems. Additional interfaces include SPI, LVDS, USB 2.0, and a configurable serial port (RS422, RS485, or 2× RS232).

SIMERA SENSE XSCAPE COMPATIBILITY

SKAIDOCK is fully compatible with Simera Sense xScape imagers. Its dedicated camera connector provides I2C, SPI, PPS, LVDS, and 5 V power interfaces with a pinout that matches the xScape specification, allowing the standard Simera Sense harness to be used directly. When combined with the xScape Readout IP Core, SKAIDOCK delivers plug-and-play functionality: command the camera and retrieve TIFF imagery with zero additional development effort.

MECHANICAL DESIGN

The SKAIDOCK enclosure is machined from 6082 aluminum alloy and treated with SurTec650 chrome(VI)-free passivation per MIL-DTL-5541F Type II, Class 3. Four mounting holes comply with the PC104 standard for secure integration into the spacecraft structure.

Compute	AMD UltraScale+ XCZU7EG ProASIC3 supervisor
RAM	4 GB LPDDR4 ECC
Flash	2× 256 MB QSPI
Storage	2× 128 GB eMMC
Interfaces	2× 1 Gbps Ethernet, 2× CAN, CameraLink, SPI, LVDS, USB 2.0, Serial (configurable: 1× RS422 or 1× RS485 or 2× RS232)
Operating temperature	-40°C to +60°C
Non-operating temperature	-40°C to +85°C
Voltage input	5V to 9V recommended
Dimensions	90.17 × 94 × 29.11 mm
Mass	319 g
Power consumption	5 W typical / 10 W worst case

Delivery

SKAIDOCK IS DELIVERED WITH:

- Interface Control Document (ICD)
- User Manual
- CAD model
- Yocto project
- Example Vivado project
- Qualification report

Qualification Testing

SKAIDOCK has been qualified for operation in space. During thermal-vacuum (TVAC) testing, it was verified for operational temperatures between -40°C and +60°C. The board has also undergone sine and random vibration testing, shock testing, and radiated emissions measurements. The Xiphos Q8J module carries extensive flight heritage.

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