



ANTELOPE

On-board computer or data processing unit? You choose!

ABOUT ANTELOPE

Antelope has two versions and can work as an **On-Board Computer (OBC)** with an optional **Data Processing Unit (DPU)** or as a **DPU** payload module. OBC is the powerful heart of the satellite, responsible for satellite control and basic task performance such as communication handling, monitoring the satellite's subsystems, handling the classic **Fault Detection, Isolation and Recovery (FDIR)** mechanism and performing planned tasks. Thanks to the powerful **FPGA system (160 GOPS)** DPU can also handle complicated on-board data processing tasks enabling Earth Observation (EO), telecommunication and other demanding data processing applications.

Antelope is a perfect solution for anyone who wants to run their algorithms and perform data or signal processing on board. This DPU gives infinite possibilities when it comes to **processing in space** – the analysis of images from cameras connected to Antelope or telemetry from other satellite's subsystems has never been so easy. Additionally, Antelope can be equipped with SATA SSD extra storage that allows to keep all the data needed for the smooth space missions' completion. You can also use algorithms from **The Herd** by KP Labs that are 100% compatible with this solution.

Antelope is part of the **Smart Mission Ecosystem** – hardware, software and AI algorithms designed to complete your mission.

ANTELOPE IS BUILT OUT OF 2 KEY MODULES



OBC

The On-Board Computer PC-104 form factor, based on **Hercules RM57** expanded with **8 or 16 MB of MRAM** and **4 or 8 GB of NAND Flash memory**.



DPU

The Data Processing Unit module supports the calculations with **Zynq Ultrascale+ MPSoC** expanded with **8 GB of DDR4** and **4 GB of NAND Flash**.

OPERATING SYSTEM

Antelope's OBC can be managed by **Oryx OBCS** – a **modular flight software tool** developed for the mission control of small satellites. Thanks to its modular architecture, based on building blocks, it supports the rapid development of the mission's software by using a vast library of components **logging, scheduling, testing and communication** to name but a few.

Antelope's DPU is equipped with **Linux ecosystem** that allows users to run their own custom applications for data processing and AI/ML solutions on orbit.

POSSIBLE CONFIGURATIONS

Antelope has **three available configurations**. It can act as a regular **on-board computer** to monitor subsystems, control the satellite's operations, communicate and command the payloads. The second configuration provides the **OBC with a DPU module** responsible for AI-based on-board data processing. The third configuration extends the mission possibilities to the maximum thanks to Antelope as a **Data Processing Unit**. Choose the version that best suits your mission!

ANTELOPE OBC



ANTELOPE OBC+DPU



ANTELOPE DPU



TECHNICAL SPECIFICATION

	OBC	DPU
PROCESSING CORES	<p>RM57 Herkules microcontroller:</p> <ul style="list-style-type: none">Dual 300 MHz ARM Cortex-R5F with FPU in lock-step	<p>Equipped with Zynq UltraScale+ MPSoC ZU2/ZU3/ZU4/ZU5:</p> <ul style="list-style-type: none">Quad ARM Cortex-A53 CPU up to 1.5 GHzDual ARM Cortex-R5 in lock-stepFPGA for custom function implementation
MEMORY	<ul style="list-style-type: none">8 or 16 MB of MRAM64 MB of redundant NOR4 or 8 GB SLC flash-based filesystem NAND storage with ECC	<ul style="list-style-type: none">8 GB DDR4 with ECC4 GB SLC NAND FlashOptional SATA SSD
INTERFACES	<ul style="list-style-type: none">Interfaces: CAN, I2C, GPIO, SPI, RS422/485, UART, GPS PPS	<ul style="list-style-type: none">Interfaces: LVDS, SPI, USB 2.0, USB 3.0, UART, CAN, Ethernet, GTH transceiversLVDS interfaces compatible with X/S-Band radios and CCSDS-compatible communication channel upon request
SPECIFICATIONS	<ul style="list-style-type: none">Supply Voltage: 6 to 14 V (VBAT) or 5V regulatedOperating Temperature: -40 to 85°CSupercap-powered RTC	<ul style="list-style-type: none">Supply Voltage: 6 to 14 V (VBAT)Operating Temperature: -40 to 85°CFPGA bitstream (reconfigurable in orbit)
SOFTWARE ECOSYSTEM	<ul style="list-style-type: none">Custom embedded softwareKP Labs's On-board Computer Software – Oryx	<ul style="list-style-type: none">64-bit Linux or bare-metal applications
FORM-FACTOR	<ul style="list-style-type: none">PC-104 board	<ul style="list-style-type: none">Daughterboard - 70 mm x 40 mm

PW-SAT3 CASE STUDY

Antelope OBC with DPU will be utilized by the PW-Sat3 satellite, coupled with KP Labs' on-board computer software - Oryx. PW-Sat3 is an in-orbit demonstrator of a new cold gas propulsion and is planned to be launched in late 2024. **Antelope will be responsible for satellite management and mission safety.**

ABOUT US

KP Labs is a NewSpace company based in Poland. We deliver AI computers and software to bring autonomy to demanding space missions. We are a team of more than 80 space enthusiasts who do not think that the sky is the limit.



SOUNDS GOOD?

Contact us at sales@kplabs.pl to attain the benefits your organization deserves!



KP Labs Sp. z o. o. | st. Bojkowska 37J, 44-100 Gliwice, Poland | +48 32 461 22 99