

# Cortex

## SMART MOBILITY INTERFACE (SMI)

The **Cortex Smart Mobility Interface (SMI)** is designed to simplify the control of multiple Enpulsion propulsion systems and offer advanced control capabilities in orbit. It can control a constellation of up to four (4) Nanos through a single communication interface (CAN or RS485/RS422). The Cortex SMI is designed for reliability, radiation tolerance, and environmental resilience.



### ✓ PERFORMANCE SCALABILITY

The Cortex SMI is equipped with a 32-bit ARM core processor capable of sending individual thrust commands to different propulsion systems or performing Attitude Control and Determination System (ACDS) using CubeSat Space Protocol (CSP), if required. This allows the Cortex to enable precise orbital manoeuvres through optimal thrust control.

### ✓ MODULARITY

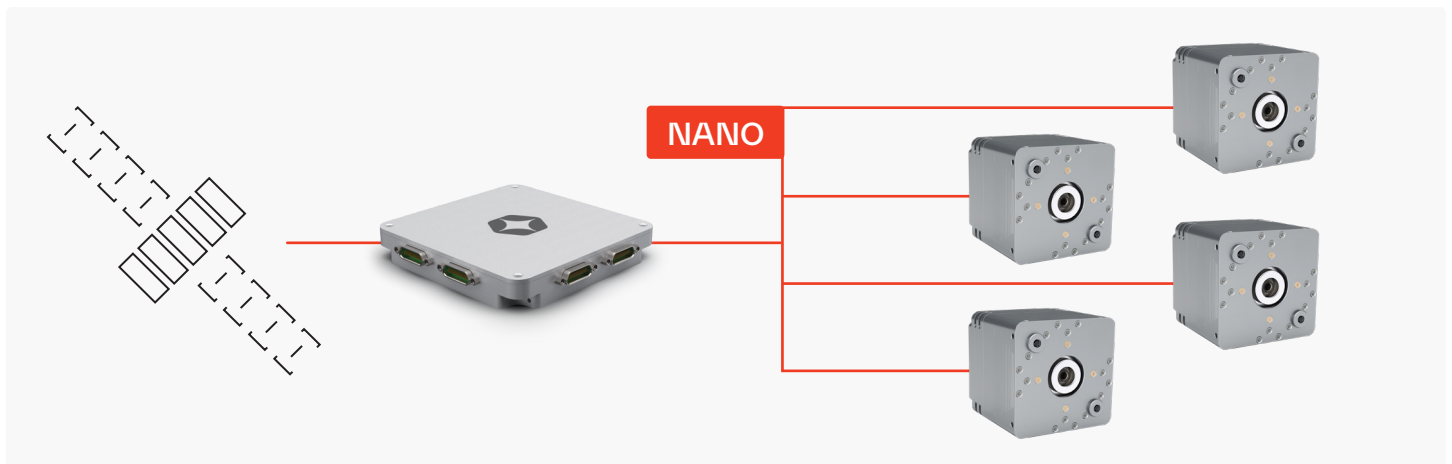
The Cortex Smart Mobility Interface is designed to be stackable with Nano propulsion systems or assembled as a separate unit. The product is designed to comply with CubeSat standards V14 Rev2.

### ✓ RAD-TOLERANT ELECTRONICS

All EEE components of the Enpulsion Nano are procured in lot-controlled batches. Active components have been selected using radiation-tolerant devices specifically aimed for low earth orbit missions (LEO). All active devices are tested for TID and SEE.

### ✓ VERSATILE PERFORMANCE

The Cortex SMI is designed to supply power and data communication to up to four (4) Nano propulsion systems, allowing for more flexibility in input bus voltages (12V to 32V).



## PROPERTIES AND PERFORMANCE

Born from the desire to provide a simple way to interface Enpulsion propulsion systems to an On-Board Computer (OBC) in a satellite, the Cortex SMI provides a reliable DC-DC power adapter chain that can adapt a variety of input power from the main bus to the default Nano propulsion system's voltages (12V).

The power supply chain is also designed for protection from bus overshoots and coupling to the satellite chassis.

Depending on customer needs, the Cortex is equipped with CAN BUS 2.0B up to 1 Mbps or RS485/RS422 up to 20 Mbps as input interfaces for the system.

The core of the SMI is a 32-bit radiation-tolerant microcontroller, which provides the communication level of abstraction between the OBC and the thrusters.

The communication between the OBC and microcontroller is performed using CSP (CubeSat Space Protocol).



|                            |                                     |
|----------------------------|-------------------------------------|
| INPUT BUS VOLTAGE RANGE    | 12V to 32V                          |
| INPUT INTERFACE            | RS422 / RS485 / CAN 2.0             |
| OUTSIDE DIMENSIONS         | Max 10 x 10 x 5 cm                  |
| EST. MAX POWER CONSUMPTION | 240W (including thrusters)          |
| MASS                       | < 500 g                             |
| OUTPUT CONFIGURATION       | Max X4 Nano Lark Propulsion Systems |
| MAX INTERFACE SPEED        | CAN 1Mbps<br>RS485/RS422 20Mbps     |

