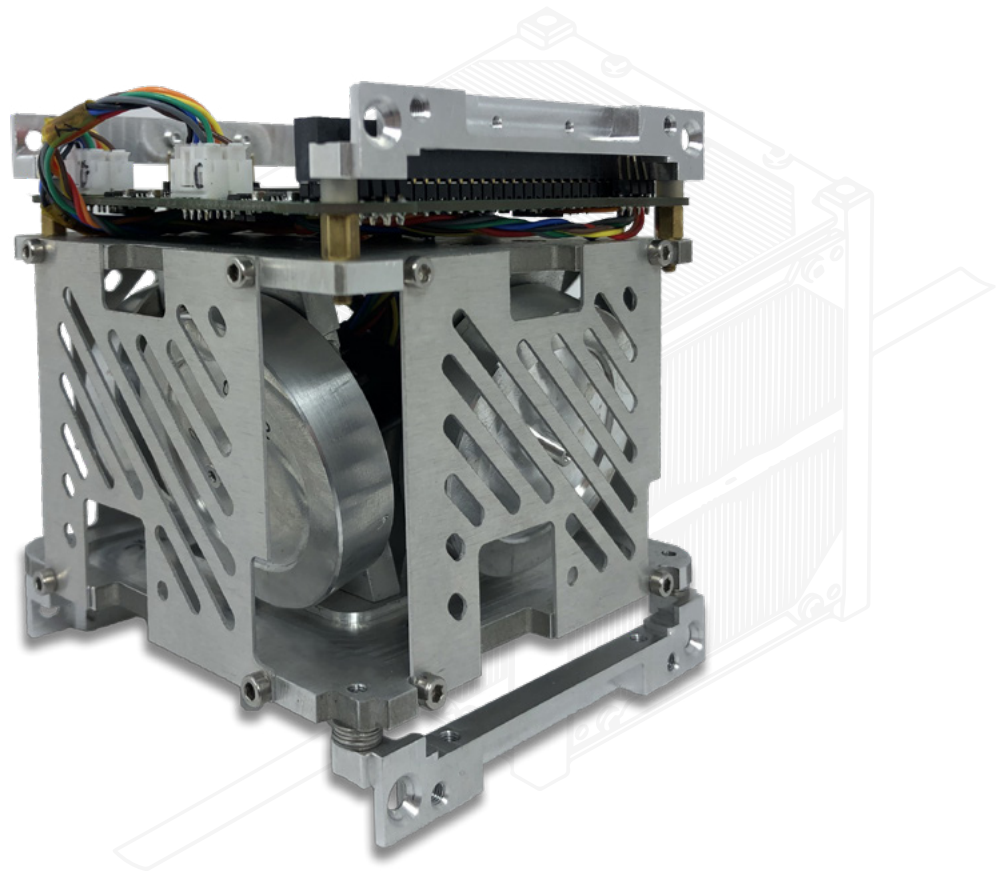


Reaction wheels module

SXC-FW4-02



OrbiCraft Pro SXC-FW4-02 reaction wheels module is an autonomous actuators module of four flywheels with drivers and control electronics which is designed to be integrated into 3U or larger nanosatellite.

Configuration:

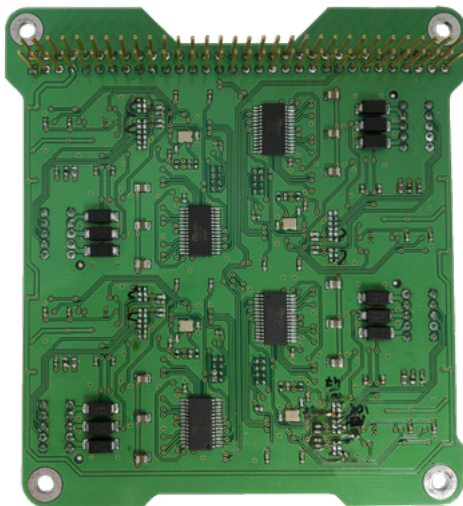
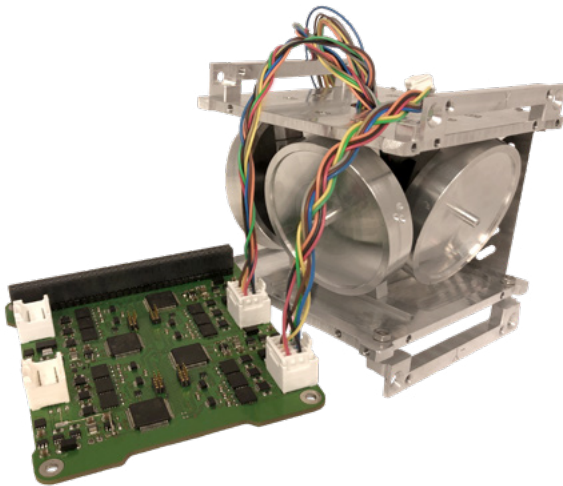
- Increased maximum rotation speed and momentum
- CAN bus data rate

Features:

- Complete 3-axis angular rate actuators for CubeSat satellite
- Easily integrates with SPUTNIX OrbiCraft-Pro platform
- Four brushless DC motors with vacuum-rated bearings
- Wide power supply range
- Momentum and current control algorithms
- Voltage, Current and temperature sensors for each motor
- CAN interface for each separate driver
- Rich telemetry and commands protocol
- Bootloader with in-flight firmware update feature

The flywheels and electronics are balanced and calibrated and provide enough momentum to rotate nanosatellite. It uses single PC/104 connection with power and CAN buses. Each flywheel driver can be driven separately with its own CAN ID.

The module is designed to be used “off the shelf” with SPUTNIX SXC-MB-04-ADC controller (or later version).



Properties

Dimensions (w/o PC104 connector)	97 x 97 x 80 mm (< 1U)
Mass	520 g
Supply voltage	5..14V
Average power consumption	< 2000 mW (@2000 RPM)
Peak power consumption	< 8000 mW
Data interfaces	CAN2.0B

Performance

Motor speed range	±6000 RPM (can be increased on demand)
Speed control accuracy	< 10 RPM
Max torque (X/Y/Z projections)	1.2/1.2/0.64 mNm (can be increased on demand)
Momentum storage (@6000 RPM, X/Y/Z 25/25/6.8 mNms)	25/25/6.8 mNms (can be increased on demand)
Self telemetry	For each motor: temperature, voltage, current, RPM, momentum.

Operating conditions

Operating temperature range	-30...+85°C
Storage temperature	-50...+105°C
Mechanical vibration	12 g (request full test report)
Mechanical shock	50 g (request full test report)

Testing*

Tests	Options
Functional	QT, AT
Vibration	QT, AT (on demand)
Mechanical shock	QT
Thermal cycling	QT, AT (on demand)
Thermal vacuum	QT, AT (on demand)

QT – Qualifying tests

AT – Acceptance tests

*QT is performed on the design/qualification model

AT is performed on the unit to be shipped

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SPUTNIX LLC is a Russian private company manufacturing high-tech small satellite components and platforms, as well as ground equipment for smallsat testing, ground-based satellite stations, and equipment for aerospace education. The company is a resident of the Skolkovo Innovation Center.