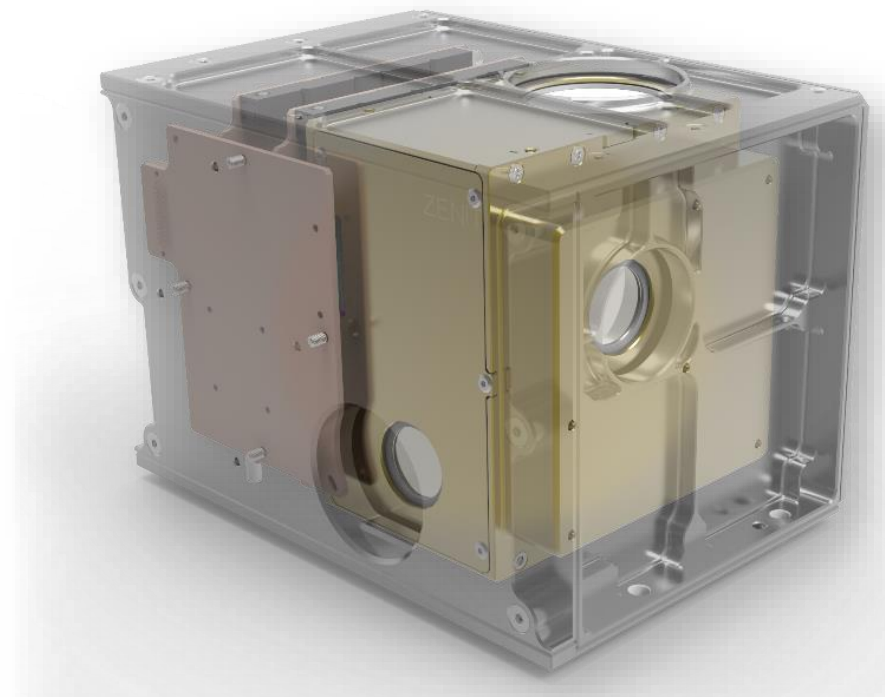
RAD-LITE

Miniaturised Space Weather Monitor for CubeSat Missions



Application

Cosmic Ray and Space Weather Research & Forecast

- ✓ Space Weather instrument fitting into the CubeSat standard
- ✓ Measuring space weather related space radiation data products as defined by the European Space Agency
  - ✓ Protons
  - ✓ Electrons
  - ✓ Heavy Ions
- ✓ To measure long-term cosmic ray flux profiles
- ✓ Optional extension possibility with a low resource magnetometer

Radiation Hardness Assurance

- ✓ To determine the LET-spectra of the incoming space radiation
- ✓ To determine the total ionising dose in different points in real time
- ✓ To study the shielding effects of the surrounding environment

Key Features

- ✓ Space radiation instrument for space weather research and forecast for CubeSat and SmallSat missions
- ✓ Radiation Hardness Assurance capability
  - ✓ Total Ionising Dose measurements at different locations
  - ✓ Alerts for the platform provider
- ✓ Configurable system
  - ✓ 1 or 2 orthogonal telescope directions
  - ✓ Total Ionising Dose measurements
  - ✓ Optional low resource magnetometer
- ✓ Fully autonomous operation
- ✓ Controlled via TM/TC
- ✓ Available interfaces: CAN, M-LVDS, RS-422

General Specification

Power	2.5-5.0 W (depending on the configuration)
Mass	0.6-1.0 kg (depending on the configuration)
Dimensions (H, W, L)	96 mm, 96 mm, 119 mm (for maximum configuration)
Input voltage range	9.9 V…12.6 V
Operational temperature range	-40°C…+40°C
Non-operational temperature range	-40°C…+85°C
Operational pressure range	10^5 Pa…10^{-4} Pa
Outgassing rate	<1% TML <0.1% CVCM
Data rate	1.5 MB/day
Handling environment humidity	40…65% relH

Environmental Specification

Temperature environment	-40°C…+85°C
Low frequency longitudinal and lateral vibration environment	TBD
High frequency random environment for 3-axis	TBD
Shock pulse	TBD
Depressurisation rate	5.0 kPa/s

Measurement Capabilities

Particle types	electrons, protons, heavy ions
Count rate range (<10% dead time)	0-50,000 cps
Minimum electron energy	250 keV
Electron energy range	0.3…8.0 MeV (2-5 channels)
Minimum proton energy	1 MeV
Proton energy range	4 MeV – 1 GeV (11-18 channels)
Heavy ion energy range	100 MeV/n…1 GeV/n
Spectra contamination	<10%
Field of view for electron and proton measurement (half-angle)	31°
Field of view for heavy ion measurement (half-angle)	46°

Flight Heritage

Mission name	Hosting platform	Orbit details	Duration	Remarks
RADCUBE	3U CubeSat	LEO 500-600 km	To be launched in Q1 2020	In maximum configuration

Contact us

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