ELEKTRA 4

Electronics for Kongsberg Technology of Rotating Assemblies

A SADE with Low Power, Open Loop control, Flight qualified for the Sentinel-1 program

KONGSBERG

ELEKTRA is a SADE (Solar Array Drive Electronics) developed by KDA to command the angular speed and position to a solar array drive mechanism (SADM) based on commands from the Spacecraft.

ELEKTRA can drive one or two 2- phase stepper motors simultaneously and independently. Power, position, speed, acceleration and step-mode (micro-step, full-step) are configurable via telecommands.

ELEKTRA has full redundancy; the redundant controller is operating in cold redundancy. Nominal and redundant controller drive separate windings of the same stepper motor.

Operational commands and telemetry are provided through the MIL-STD-1553B communication bus. Additional interfaces include redundant High Level 14V channels for ON/OFF control, Contact Closure channels for status telemetry and thermistors with redundancy for temperature monitoring. Temperature monitoring can be performed regardless of the state of the ELEKTRA.

Each of the 2 controllers is independently powered with 20V to 40V DC. Nominal voltage is 28V.

Provisions are included for functional verification at any stage of the spacecraft assembly.

The ELEKTRA has the following features:

- Advanced electronics design to high reliability and efficient performance
- Highly efficient power DC/DC converter with custom input filter
- Over voltage protection and under voltage lock out
- Power level to motors can be commanded – 16 levels available for nominal power (0W to 4.1W)
- Temperature monitoring even as the ELEKTRA is switched OFF
- Internal current limiter prevents fault propagation
- MIL-STD-1553B validated to AS4111

ELEKTRA LO-S1 EQM

Features
General
•Drive electronics for 1 or 2 stepper motors independently
•SADE function with full redundancy
•Micro step and full step selectable
•Constant power to motors
•Maximum nominal power is 4.1W to each motor
•6.3W for SADE during motor operation
•Less than 2W consumption when Idle
•Operating temperature -30℃ to +60℃
•Qualified non-operating -40 ℃ to 75 ℃
•Qualified operating -35 ℃ to 70 ℃
Interface
•MIL-STD-1553B bus communication
•High Level 14V On/Off
•Contact Closure for status telemetry
•Temperature monitoring with redundancy
•Power bus 20V to 40V, 28V nominal
•Mass 2.9 kg

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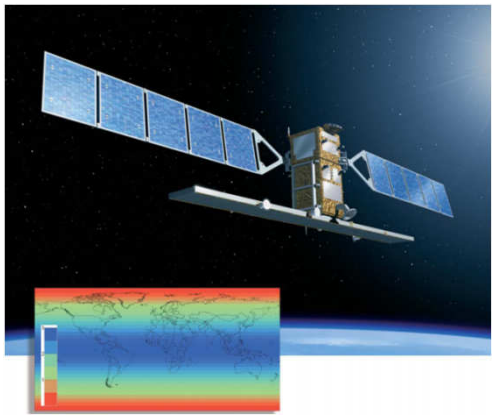
Sentinel-1 is one element in the GMES (Global Monitoring for Environment and Security) programme, an initiative by the European Commission and ESA to set up a sustainable European network for recording and analysing environmental data. Sentinel-1 will help to monitor and analyse environmental events round the globe.

Sentinel-1 data will benefit numerous services. For example, services that relate to the monitoring of Arctic sea-ice extent, routine sea-ice mapping, surveillance of the marine environment including oil-spill monitoring and ship detection for maritime security, monitoring land-surface motion risks, mapping of land surface for forest, water and soil management and mapping in support of humanitarian aid and crisis situations.



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KARMA 4

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