

ELEKTRA



KONGSBERG



KONGSBERG ELEKTRA

Electronics for Kongsberg Technology of Rotating Assemblies

ELEKTRA is a fully integrated two axis drive electronics developed by KDA to command the angular speed and position based on commands from the Spacecraft, and acquire angular position from a potentiometer

ELEKTRA can drive 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 TM for ON/OFF control, RSA interfaces for status telemetry and redundant thermistors for temperature monitoring. Temperature monitoring at the ELEKTRA TRP can be performed regardless of the state of the ELEKTRA..

FEATURES

- Constant power control
- Full Cold Redundancy
- Full protection against over-voltage, under-voltage and short circuit
- Configurable Power / Speed/Acceleration
- Full step to 128 micro step
- High resolution speed command
- High resolution position readout
- Mechanical end stop switch acquisition
- Programmable acceleration
- Low EMC emissions
- FDIR/Housekeeping

ELEKTRA can operate on any unregulated power bus from 20V to 40V (LCL Class 1). Speed and accelerations can be set with high accuracy, especially in low speed/acceleration region. This assures that low forces are induced on the spacecraft even by the rotation of large solar arrays.

ELEKTRA FG has flight heritage on the following missions: Sentinel-1 A/B and Solar Orbiter. ELEKTRA FG is contracted for the following missions: Sentinel-1 C/D, MetOp-SG, JUICE, Copernicus Co2M, MSR-ERO, Space Rider, Copernicus CHIME and Copernicus LSTM

ELEKTRA Technical Data

Mechanism interface

Motor compatibility	2-Phase Stepper Motor
Motor drive	Constant power
Motor voltage	28V maximum
Step resolution	Up to 128 micro step
Speed and acceleration resolution	22-bit
Position reading resolution	14-bit
End-stop switch	NO or NC mechanical switch
Thermistor	10kOhm

Electrical

Power Bus	20V to 40V regulated or unregulated
Power Class	LCL Class 1
Maximum operational power consumption	8.5 Watts
Maximum stand-by power consumption	4.9 Watts

Interfaces

Communication	MIL-STD-1553B
On/Off Command	High Level 26V
On/Off status	Relay contact (RSA)
Temperature Monitoring	Redundant Thermistors, 10kOhm

Environment

Non-Operational qualification temperatures	-50 °C to 80 °C
Operational qualification temperatures	-30 °C to 70 °C
Random vibration levels	IP 12.8, OP 26.3 [g RMS] SRS 2000 g at 1500 Hz
Shock	SRS 2000 g at 1500 Hz

Mass

2.89 kg

Dimensions

Length	215 mm
Width	140 mm
Height	160 mm



ELEKTRA FG