jenaoptronik

# Fine Sun Sensor FSS

Based on photo diodes the Jena-Optronik **FSS** is an analogue sun sensor. The FSS is produced for application on Telecom, Earth Observation and Scientific satellites with high pointing requirements.

**FSS has been designed with two orthogonal detectors, full internal redundancy and special thermal radiation stability.**

## Special Features

- Lifetime >13 years
- Radiation hard design
- Robustness against Earth albedo

## Measurement Principle

- Illumination of a photodiode array with eight pixels by sunlight via a slitmask
- Angle of incident sunlight corresponding to illumination of photodiodes
- Calculation of sunlight-angle with an algorithm based on arctan-function of geometrical parameters and currents on photodiodes

## Technology for Sun Sensors

The requirements for the sensors are very demanding. In addition to measurement accuracy and efficiency, reliability and durability play a decisive role. All of our developments have proven this value under the conditions in space. In-flight data are available and considerably better than specified.

Sentinel-1, Earth observation satellite for Europe's GMES programme

# FSS Fine Sun Sensor Performance

| | | |
|---|---|---|
| **Dimensions** | | |
| | 160 mm x 145 mm x 56 mm | |
| **Mass** | | |
| | < 650 g | |
| **Temperature Range** | | |
| Operational | -30 °C...+65 °C | |
| Non-operational | -40 °C...+75 °C | |
| **Power Consumption** | | |
| | ≤ 200 mW per channel | |
| **Performance** | | |
| Field of View | 128° [α-channel]<br>128° [β-channel] | |
| α/β-channel accuracy | < 0.15° [3σ] | |
| **Redundancy** | | |
| | main and redundant channel | |
| **Data Output** | | |
| | 36 analogue voltage signals,<br>multiplexed for the 36 diodes | |
| **Input Voltage Supply** | | |
| | ±(13...15 V) DC | |
| **Output Voltage Range** | | |
| | -5...+5 V DC, analogue signal | |
| **Detector Layout** | | |
| | 2 redundant diodes arrays for 2 orthogonal axes α and β each | 2 dark current diodes [redundant],<br>2 sun presence diodes [redundant] |

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