

JENOPTIK
GERMANY

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Fine Sun Sensor FSS

Based on photo diodes, the Fine Sun Sensor FSS is an analogue sun sensor. It has been designed with two orthogonal detectors, full internal redundancy and special thermal radiation stability. The FSS is produced for application on Telecom, Earth Observation and Science satellites with high pointing accuracy.

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



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.



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

FSS Fine Sun Sensor Performance

Dimensions [mm]	160 x 145 x 56	
Mass [g]	< 650	
Temperature Range [°C]	Operational -30...+65 Non-operational -40...+75	
Power Consumption [mW]	< 200 per channel	
Performance	Field of View 128° [α -channel] 128° [β -channel] α/β -channel accuracy < 0.15° [3 σ]	
Redundancy	main and redundant channel	
Data Output	36 analogue voltage signals, multiplexed for the 36 diodes	
Input Voltage Supply	$\pm(13...15\text{ V})\text{ DC}$	
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], 2 sun presence diodes [redundant]



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Jena-Optronik is an EN/AS 9100 certified company.