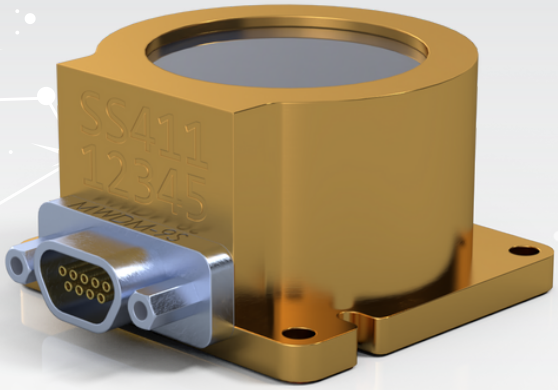
AQUILA
SUN SENSOR



A sun sensor determines a spacecraft's orientation with respect to the sun. The front surface of the NewSpace Systems (NSS) Aquila-D02 (NFSS-411) sensor is a synthetic sapphire window with a reflective metal coating beneath. Slits are etched in the metal and sunlight passes through them and through an optical filter onto a sensor. The charge on the photo-sensors are read by the microcontroller which processes the image and computes the sun vector. The vector and other telemetry is returned to the spacecraft through the serial interface. The unit can be powered from unregulated DC power from the spacecraft.

PERFORMANCE	AQUILA-D02 [NFSS-411]
FUNCTIONAL CHARACTERISTICS	
Field of view	140°
Update rate	5 Hz typical
Accuracy	≤0.2° RMS* error over 140° FOV
PHYSICAL CHARACTERISTICS	
Dimensions	34 mm x 40 mm x 20 mm
Mass	<37 g
Power	Idle: <3mA [15mW], bootloader mode <8mA [40mW], application mode Active: <30mA [150mW]
ENVIRONMENTAL CHARACTERISTICS	
Thermal (acceptance/operational)	-25 °C to +70 °C
Mechanical Tests (qualification)	34.93g rms (random), 26.25g (sine), 2000g shock
Radiation (TID) (qualification)	20 krad (component level)

INTERFACES	
Power supply	5 VDC to 50 VDC (5 VDC nominal)
Data	RS-485
Connector	9-way female Micro-D
Mechanical	4 x M2.5 clearance holes

***AQUILA-D01:** Sun Sensor Unit of ≤0.1° RMS error over 140° FOV accuracy available on special request.*

***ACCEPTANCE TESTING:** All FM parts undergo random vibration (10 grms) as well as thermal cycling (four cycle ambiant pressure) to five degrees beyond operational thermal specifications. However, NewSpace can perform additional environmental testing if required by a client.*
***CONFIGURATION MANAGEMENT:** Specifications are subject to change. Please refer to the latest version.*

FEATURES

- Ultra small size and low mass
- Low power
- Simple to interface
- Wide field of view
- Digital architecture (Albedo immune)
- Calibration embedded

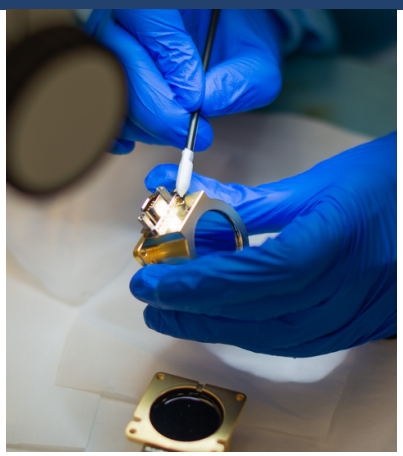
APPLICATIONS

- Accurate determination of sun-angle
- Can be used in conjunction with a magnetometer for simple attitude control
- Can be used as safe-mode sensors on gyro or star-mapper-controlled systems
- Four sensors can achieve full sky coverage

QUALIFICATION

The Aquila-D02 (NFSS-411) is TRL 9 with extensive in-orbit heritage. The NFSS-411 Sun Sensor has demonstrated in-orbit lifetimes of >5 years in LEO and due to its robust nature has become a preferred choice for constellation primes. To date, >400 Aquila-D02 (NFSS-411) units have been delivered globally. Currently, the NSS Sun Sensor is baselined on 5 constellations.



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