



Star Tracker VST-68M



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VECTRONIC Aerospace offers with the VST-68M a high performance star tracker for small satellite applications with the technical capabilities and radiation tolerance suitable for LEO, GEO and even for interplanetary missions. The predecessors of this sensor, the VST-41M series, have been successfully used in various small satellite missions.

The star tracker consists of two main elements:

- The optical head with the high quality lens system (Leica) and a mission dependent baffle in front of it
- The star tracker processing electronics with the on-board star catalogue

The VST-68M performs direct and autonomous measurement of the spacecraft attitude in the body fixed star tracker reference frame relative to the celestial reference system J2000.

Core element of the sensor's processing electronics is a 1024 x 1024 pixel rad-hard CMOS sensor, specially developed for space applications, which transforms star images detected through the lens into electrical information. After the A/D conversion the CPU analyses the incoming data through a series of several algorithms, which eliminate fixed pattern noise, objects that are too bright like the Moon or planets and then determine star positions using a barycentric algorithm. With a focal length of 75 mm the sensor's FOV is around 14°x14° which guarantees at least 16 visible stars independent of the current attitude. The attitude information is provided together with other status telemetry in the form of quaternions and/or Euler angles. The communication interface comprises two independent asynchronous SCI's with a baud rate up to 1 Mbit. A redundant CAN bus interface is also available.

Technical Data

Mechanical	
Dimensions (with baffle)	60mm x 60mm x 138 mm
Mass	0.470 kg
Mounting pattern	4x M4 50 mm x 50 mm

Environmental	
Operating temp. range	-20°C to +65°C
Storage temp. range	-40°C to +80°C
Vibration	20g rms random 3 axis
Radiation tolerance	>20 krad

Electrical	
Power consumption.	3.0 W
Input voltage range (VDC)	9 to 40
Signal interface	2 x RS422 / 2 x CAN
Signal characteristics	Serial asynchronous / CAN
Connector type	MDM 25 male

Performance	
Accuracy 2σ (x,y / z axis)	5 arcsec / 30 arcsec
Acquisition probability	>99.7%
Update rate	5 Hz
max tracking rate	3 deg/sec
Field of view	14° x 14°
Time to first acquisition	Typ. 1 sec