Star Tracker
RIGEL-L

Applications

- LEO missions and constellations
- Targeted at cost effective missions requiring high performance
- 3-axis attitude determination
- Agile spacecraft

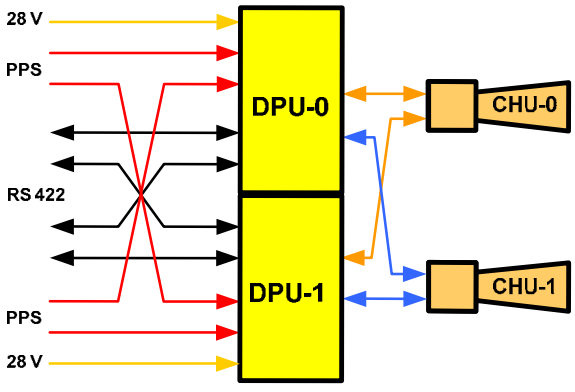
The RIGEL-L is a fourth generation star tracker designed specifically in support of cost-effective missions requiring accurate, reliable and autonomous lost in space 3-axis attitude estimation.

The Camera Head Unit (CHU) is based on active pixel sensor technology allowing increased capability and flexibility, while minimising cost, mass and power.

The star tracker outputs bore sight vectors in the J2000 frame as a quaternion with an associated time stamp. With suitable filtering the star tracker can also be used to provide excellent rate estimates.

Heritage

The Rigel-L draws on the combine heritage of an SSTL DPU and a SODERN CHU, leveraging many years of development, test and qualification by leaders in the respective fields.



Typical Application
(Dual cold redundant chains with cross strapping)

CHU with 30 degree Baffle

Key Specifications @ EOL(single CHU)

- Field of View
  - 22.6 x 22.6 deg
- Attitude Bias
  - X/Y < 3 arcsec (1-σ)
  - Z < 3.5 arcsec (1-σ)
- Attitude Relative Accuracy @ 4Hz
  - X/Y < 3 arcsec (1-σ)
  - Z < 25 arcsec (1-σ)
- Rate up to 6 deg/s
- Acceleration up to 2.5 deg/s2
- Attitude update rate up to 16Hz

Features

- Fully autonomous with lost in space functionality
- Modular design with separate CHU and Data Processing Unit (DPU)
- Configurable to support up to 3x CHU from a single DPU
- CHU can be cross strapped between 2x DPUs
- 7.5 year design life

Options

- 40 degree sun exclusion baffle available
- Alignment cube
- Dual redundant CAN TM/TC interface
- GEO variant RIGEL-G under development

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Availability

- Q2 2011, 12 month lead time

Interfaces

- Dual-redundant RS422/RS485 TM/TC interface
- 16-50V Power Supply

Other ADCS products

- Complete ADCS suite
- Magnetometers and sun sensors
- Magnetorquer rods
- Reaction wheels
- GPS navigation receiver

Field of View	22.6 x 22.6 deg
Attitude Accuracy (1-σ)	
Bias	X/Y < 3.0 arcsec Z < 3.5 arcsec
Relative Accuracy	X/Y < 3 arcsec Z < 25 arcsec
EOL for a single CHU, DPU operating at a 4Hz update rate	Tracking rate @ 0.5 deg/s CHU temp @ 15 degC
Update Rate	1Hz – 16Hz
Maximum Tracking Rate	6 deg/s, 2.5 deg/s2
Maximum Stars Tracked	15
Exclusion ngles (40 deg / 30 deg Baffle)	Sun: 40 / 30 deg Earth: 29 / 24 deg Tolerant to Moon in FOV
Interface	CAN / RS422 / RS485
Mass / Volume	
DPU	155 x 210 x 56 mm, 1.2 kg
CHU	90 x 111 x 139 mm, 1.0 kg
40 deg Baffle	134 (D) x 82 (L) mm, 0.25 kg
30 deg Baffle	147 (D) x 144 (L) mm, 0.4 kg
Power	Supply 16-50V unregulated
Single CHU	10W at 28V
Double CHU	12W at 28V
Vibration Qualification	
DPU	20 Grms
CHU	25 Grms
Operating Temperature	
DPU	-20 to +50 degC
CHU	-20 to +50 degC
Radiation	< 10kRad

Example of a multiple CHU configuration

SSTL is ISO9001:2008 certified

Subsystems are manufacture to:

- ECSS Q-ST-70-08C
- ECSS Q-ST-70-38C
- All work overseen by ESA-trained assembly staff

Standard delivery service includes:

- compliance testing
- vibration test
- thermal cycling
- user manual
- electrical, mechanical & thermal ICDs
- test results
- export license and shipping
- thermal vacuum testing available

Surrey Satellite Technology Limited

SSTL has launched over 30 satellites gaining almost 200 years in-orbit experience. SSTL draws on its world-class expertise in both small satellite platform technology and high and medium resolution optical instruments. SSTL provides complete turn-key system solutions; spacecraft, ground station, launch, operations and image processing.

SSTL is unique in the space industry; able to design, manufacture and integrate multiple satellites in-house.

Changing the economics of space

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