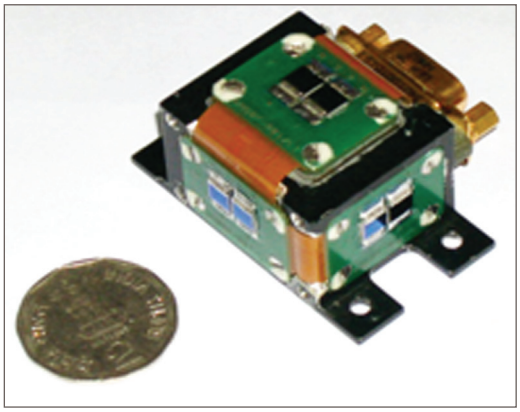
# 4 Pi SUN SENSOR

ANTRIX CORPORATION LTD.
A "Mini Ratna" Company



One Optical head Unit of the
4 Pi Steradian Sun Sensor

The Laboratory for Electro-Optics Systems (LEOS) of Indian Space Research Organisation (ISRO) is responsible for design, development and production of electro-optic sensors and optics for spacecraft use. Sun Sensors are used to determine the relative angle between the spacecraft and the sun. This is accomplished by "sensing" the radiance from the sun and determining the vector from the outputs of detectors. Sun Sensors are used for attitude control, safe mode operation, solar array pointing and station keeping.

The Four-PI Steradian Sun Sensor consists of four optical heads. Each head has six detectors with built in redundancy. The detectors are mounted on three faces which is normally designated as X, Y and Z. The optical detector is solar cell of size 5mm x 5mm. The output of the sensor heads is current from the solar cell which varies as a cosine function with sun incidence angle. This has to be processed to get the corresponding angle information. The sensors are tested for electrical output and qualified for thermal cycling and vibration.

## HERITAGE

More than 100 numbers flown in GEO & LEO spacecrafts

## SPECIFICATIONS

| | | |
|---|---|---|
| 1. | ***Range*** | 4πSS Steradian (total system) |
| 2. | ***Output*** | I (mA) = A * Sin θ + C<br>Where,<br>θ = Sun angle measured by 4π SS in degrees<br>I = Current output from the sensor in mA<br>A = Peak amplitude of 4π SS output in mA<br>This output is available for each face |
| 3. | ***Null Accuracy*** | ± $5^0$ |
| 4. | ***I peak*** | 9mA |
| 5. | ***Deviation from fit (%)*** | ≤10% |
| 6. | ***Size of each unit*** | 55mm X 40mm X 30mm |
| 7. | ***Weight of each unit*** | 50 gms |
| 8. | ***Operating Temperature range*** | -$20^0$C to +$60^0$C |
| 9. | ***Vibration test levels*** | 10.15 grms qualification levels |
| 10. | ***Interface to electronics*** | 9 pin 'D' type connector |

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