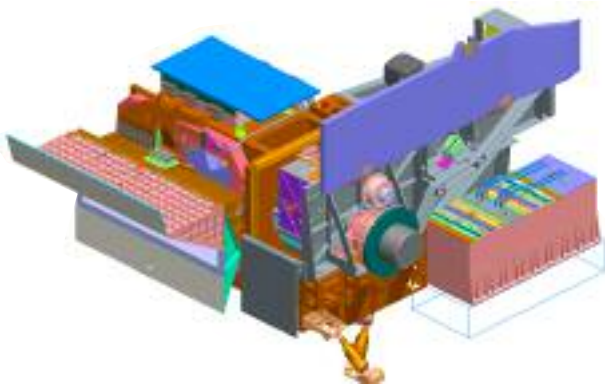




ITT

Engineered for life

Next Generation Sensor for Global Environmental Coverage Imaging/Radiometer Instrument



With over 30 years experience in producing operational polar-orbiting radiometers, ITT's Imaging/Radiometer Instrument (IRI) provides an invaluable tool to meteorological and environmental users. The IRI is a multispectral sensor that represents a significant advancement in performance over the current generation of NOAA's polar-orbiting instruments by providing continuous calibrated multispectral low earth orbiting (LEO) imagery and radiometric data by providing improved resolution, sensitivity and spectral diversity relative to today's Polar-orbiting Operational Environmental Satellites (POES).

ITT's IRI has 17 spectral channels from visible through long-wave infrared wavelengths and is used to collect high resolution, calibrated data of reflected solar and radiated thermal energy from the earth and atmosphere. The IRI supports production of 21 National Polar-orbiting Environmental Satellite System (NPOESS) Environmental Data Records including: Sea Surface Temperature – Imagery – Cloud Masks – Aerosols – Fire Detection. The sensor also provides an additional channel to support collecting data for world coverage of water vapor.

Key Features

Application	Operational atmospheric and surface radiometry and imagery
Satellites	NPOESS or compatible satellite
Orbit	Nominally 828 km circular, sun-synchronous
Aperture	21 cm, effective diameter
Spatial Resolution	Imagery channels ≤ 0.4 km, at nadir; moderate ≤ 0.8 km, at nadir
Scan Method	Rotating telescope, whiskbroom scanning
Detector Cooling	4-stage passively cooled radiator
Detectors	Silicon and HgCdTe technology linear arrays with spectral filters

Specifications

Imaging Radiometer Instrument

Parameter	Value
Space Envelope	138L X 88H x 138W, cm
Weight	247 kg
Power (Orbit Avg)	205 W
Data Rate	≤ 18Mbps
Design Life	7 years, on-orbit
Mapping Accuracy	≤ 1.5 km
Swath Width	≥ 3000 km
Band-to-band Registration	≥ 80% overlap, imagery channels
Absolute Radiometric Accuracy	≤ 2%, reflective ≤ 0.4%, thermal, 10 μm
Polarization Sensitivity	≤ 5%
Command/data I/F	1394 firewire

Wavelength Band Performance

λ (mm)	SNR	L_{TP} (W/m ² /sr/mm)
0.412	100	45
0.488	100	31
0.555	100	27
0.640	119	22
0.865	150	25
1.240	74	5.4
1.378	83	6
1.610	171	7.3
2.250	10	0.12

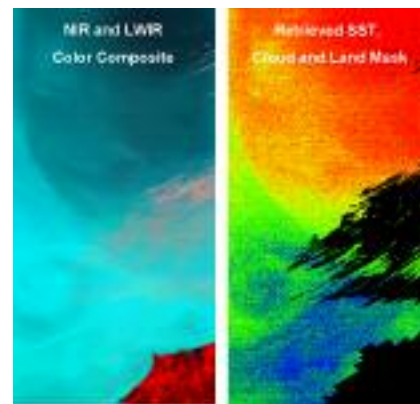
Wavelength (μm)	NEΔT	T _{TP} (K)
3.70	0.396	270
3.74	2.5	270
4.05	0.107 / 0.423	300 / 380
6.95	0.2	240
8.55	0.091	270
10.763	0.07 / 0.2	300 / 480
11.45	1.5	210
12.013	0.072	300

The IRI's modular design provides simplified integration and test and flexibility for future technology upgrades with minimal design impact. ITT's sensor design approach maximizes hardware re-use from other programs for a low risk solution.

Sensor Benefits

- Calibration accuracy of data ensured with simple yet reliable on-orbit blackbody and reflective calibration subsystems.
- Electronics module provides control of sensor all data formatting for 1394 CCSDS.
- Sensor Data Record Algorithm Produces Radiometrically Calibrated and Geolocated Image Data for Product Generation

Image Products



Simulated Sea Surface Temperature Retrieval with Cloud and Land Masks

ITT provides a full range of remote sensing and GPS navigation solutions. For further information, contact us at:

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