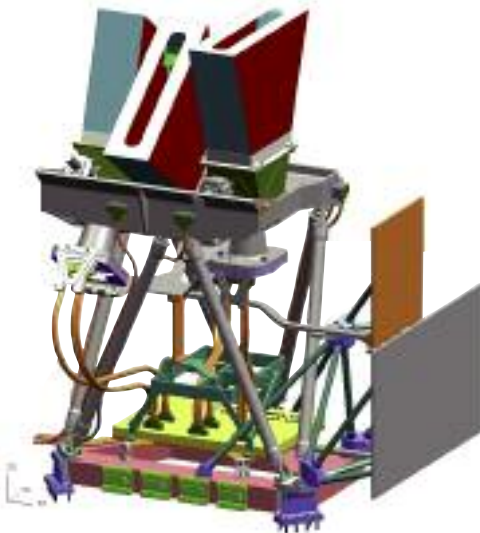




ITT

Engineered for life

Advancing Remote Sensing Technologies Low Light Imager



With ITT's 40 years experience in producing operational polar-orbiting instrument LLI is the low-risk tool for low-earth imaging.

ITT's Low Light Imager (LLI) represents the latest advancement in low light imaging performance over current polar-orbiting low light instruments. Building on ITT's extensive experience, this sensor results in improved terminator imagery, lunar reflection (clouds, snow, ice) and visible emission-based products (city lights, wild fires).

The LLI is a visible band sensor that provides high Signal-to-Noise Ratio (SNR) imagery over a wide dynamic range spanning from full sun to 1/4 moon illumination ($\sim 10^7$ orders of magnitude). Its simple design provides 2–4x resolution improvement, greater radiometric calibration, and more uniform pixel size variation across the swath than the current Defense Meteorological Satellite Program's (DMSP) Operational Linescan System (OLS).

The LLI's modular design enables simplified integration and test, and provides flexibility for future technology upgrades without extensive redesign. This unique architecture allows the LLI to be integrated as a standalone instrument or coupled with other instruments for expanded data collection. The lightweight and low-power requirements support use on non-space platforms.

Key Features

Application	Low light imaging
Satellites	NPOESS or compatible spacecraft
Orbit	Nominally 828 km circular, sun-synchronous
Aperture	26 mm, diameter
Spatial Resolution	≤ 0.50 km, at nadir, ≤ 1.0 km, at EOS
Scan Method	WFOV pushbroom scanning
Sensitivity	SNR of 13 at nadir, SNR of 7 at EOS; 1/4 moon illumination
Detector Cooling	Passive radiator
Detectors	Silicon CMOS linear arrays, visible (500 – 900 nm)

Specifications

The sensor's design approach capitalizes on ITT's operational experience and maximizes hardware re-use for a lower risk solution. LLI focal planes use standard CMOS processes and have been screened for radiation hardness at levels that support long-life missions making this a low-risk tool for low light earth imaging.

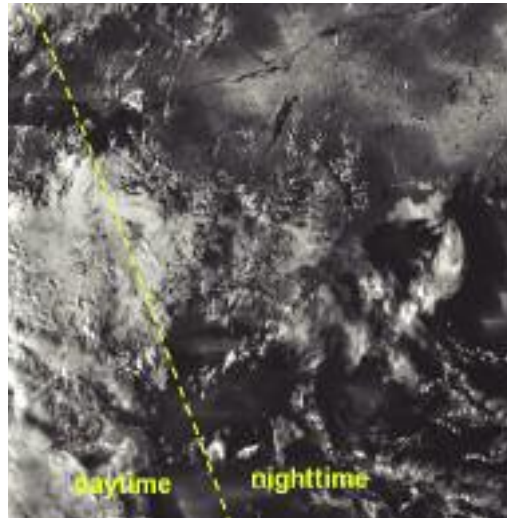
Sensor Benefits

- Three camera approach to the low light imaging mission employs simple pushbroom scanning with an easy-to-operate, low-risk design
- Instrument is designed to support global coverage with continuous data collection, and can be tailored to a single (nadir) camera. In lower orbits, the LLI resolution approaches 50m
- Dedicated long sunshades provide superior stray light control to deliver excellent SNR performance under low light imaging conditions
- Sensor data record algorithm produces radiometrically calibrated and geolocated image data for product generation
- Application of near constant contrast algorithm provides contrast balanced terminator imagery

Low Light Imager

Parameter	Value
Small Size	74L X 52H x 88W, cm
Low Weight	35 kg
Low Power	37 W
Data Rate	≤ 2Mbps
Design Life	7 years, on-orbit
Mapping Accuracy	≤ 1.5 km
Swath Width	≥ 3000 km
Absolute Radiometric Accuracy	≤ 5-100% depending upon dynamic range
Command/data interface	1394 firewire or Spacewire

Image Data Product



Simulated Terminator Near Constant Contrast (NCC) Data Product

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

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