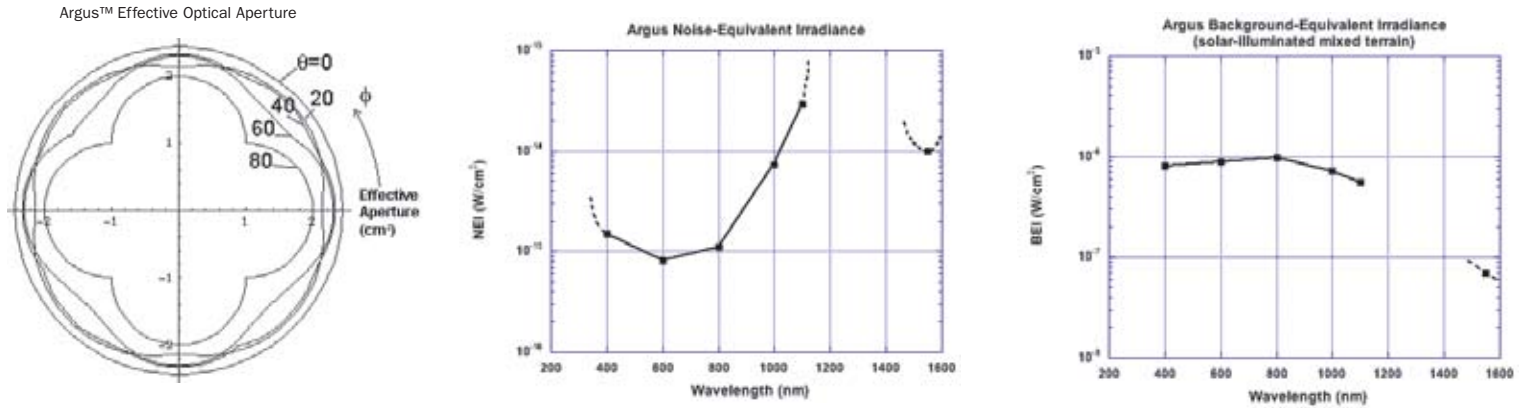


Argus™ is a sophisticated laser threat warning and assessment system with state-of-the-art electro-optical and signal processing capability. The Argus™ laser threat assessment system detects visible and near-infrared laser radiation over a hemispherical field-of-view and provides measurements of angle-of-arrival, wavelength, and irradiance. The system consists of a compact optical detector module connected to a controller card. Applications include satellite situational awareness, and laser threat discrimination and detection for aircraft, vehicles, and individuals.

Key Features

- **Unique optical system collects light over full hemisphere**
- **Threat radiation is focused onto an image sensor, spot position related to angle-of-arrival**
- **Transmission through custom color filter array determines wavelength, provides a means for rejection of broadband sources**
- **Controller card collects and assesses laser threat information, provides simple messages to host**
- **Low battery power consumption and thermal dissipation compatible with micro-satellite applications**
- **Simple serial interface for command and communication with host**
- **Provides space assets with ability to monitor, assess, and report laser irradiation**



Performance Specifications

Angular resolution: $< 1^\circ$ in θ and ϕ
 < 9 km on surface from LEO ($h=500$ km)
 < 700 km on surface from GEO ($h=40$ Mm)
 Wavelength Range: 400 – 1100, 1550 nm
 Spectral Resolution: 20 nm

λ (nm)	NEI (W/cm ²)	BEI* (W/cm ²)
400 nm	1.5×10^{-15}	8.1×10^{-7}
600 nm	8.2×10^{-16}	8.8×10^{-7}
800 nm	1.1×10^{-15}	9.7×10^{-7}
1000 nm	7.4×10^{-15}	7.1×10^{-7}
1100 nm	2.9×10^{-14}	5.5×10^{-7}
1550 nm	1.0×10^{-14}	7.0×10^{-8}

* solar-illuminated terrain background

Physical Specifications

Size: 3.5" x 3" x 0.5" (controller)
 1.5" x 2" x 0.8" (detector)
 Weight: 92 grams (~3 oz.)
 Power: 2.5 Watts (0.8 Watts standby)
 Communications: UART serial
 Environmental : -40°C to +125°C (electronics)
 -10°C to +80°C (imager)

Detector Module

The Argus™ detector module is comprised of a novel quad lens/prism integrated assembly that can accept incoming radiation over a field-of-view exceeding 2π steradians with an effective aperture that is nearly constant over the entire field. The optical system focuses incoming laser radiation onto the surface of a two-dimensional imager – the position of the focal spot(s) on the imager array are a function of the laser's angle-of-arrival. A custom array of spectral filters with unique transmission bands, aligned to the imager, provides a means for determination of the wavelength spectrum of the incident radiation. Sufficient spectral resolution exists to discriminate between narrowband and broadband radiation, allowing detection of laser radiation even in the presence of solar glints or artificial light sources.

Controller Card

The Argus™ controller card is based on a commercial digital signal processor that orchestrates the detector imager readout, data processing, communication, and housekeeping tasks. The controller accepts text-based commands and returns threat and status information via a full-duplex serial port. Logs of laser threat and system status information can be stored to non-volatile memory for unattended operation, even in instances where a power supply may not be assured.