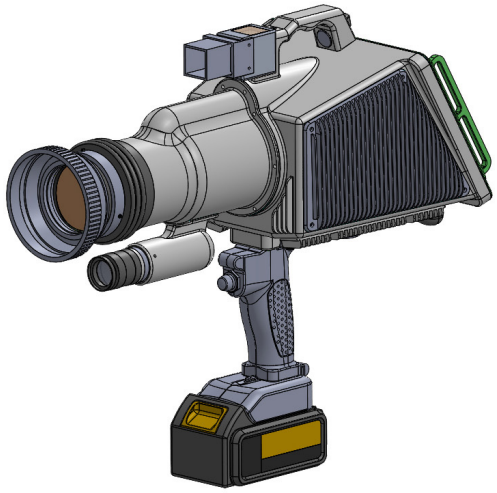
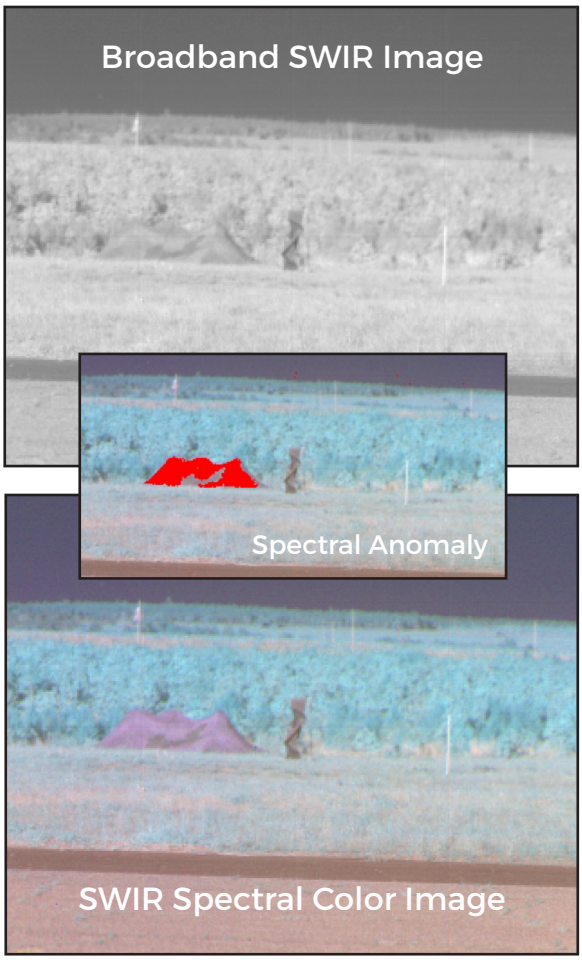


LightShift™ SWIR

Snapshot Multispectral Camera

LightShift™ SWIR enhances survivability using shortwave infrared imaging to detect and identify threat materials at a stand-off distance in real-time.



A camouflage net shows low broadband SWIR contrast (top), but high contrast in SWIR spectral color (bottom). Spectral anomaly detection clearly detects It (center).

SPECTRAL IMAGING FOR DYNAMIC ENVIRONMENTS

LightShift™ SWIR's unique snapshot spectral imaging design provides for a portable, field-deployable camera capable of collecting full spectral datacubes in a single exposure and eliminating motion artifacts. Unlike previous snapshot spectral imagers, LightShift™ processes spectral data at video-rates (30 fps), including automated calibration and spectral correlation algorithms, enabling live continuous monitoring of the scene for increased situational awareness.

CUSTOM FILTER SETS FOR YOUR TARGET MATERIALS

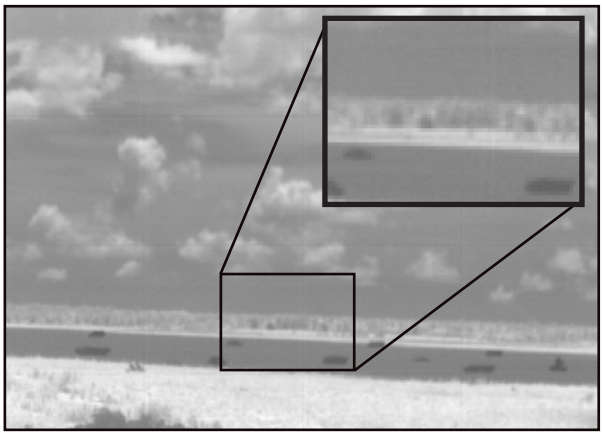
Custom filter sets with up to sixteen bandpass filters optimize LightShift™ SWIR for your target materials. Our team will assist you in designing an array of custom filters specific to your targets with confirmed transmission/out-of-band blocking. The positioning of the filter tray at the front of the system's lens allows convenient substitution of filter sets by users and makes each LightShift™ SWIR camera flexible, ready to be re-tasked for new targets.

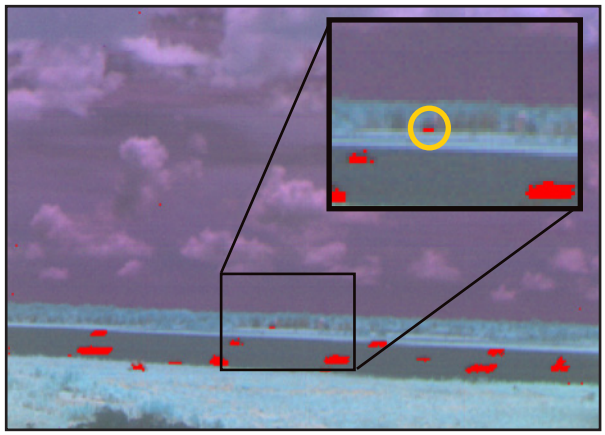
UNIFORM PERFORMANCE ACROSS SYSTEMS

Snapshot multispectral cameras currently in the marketplace typically employ a filter-on-chip design prone to inhomogeneities in the spectral filters due to micro-technological processing constraints. LightShift™ SWIR's use of commercial off-the-shelf filters from high volume manufacturers delivers reduced fabrication costs and ensures consistent filter quality and photometry between LightShift™ cameras.

ADDED POLARIZATION IMAGING

Simultaneously capture spectral and polarization information for every pixel by adding optional polarizers to the filter set. Separately these dimensions provide a partial representation of the scene. LightShift™ SWIR joins them to achieve better classification performance for your targeted objects.

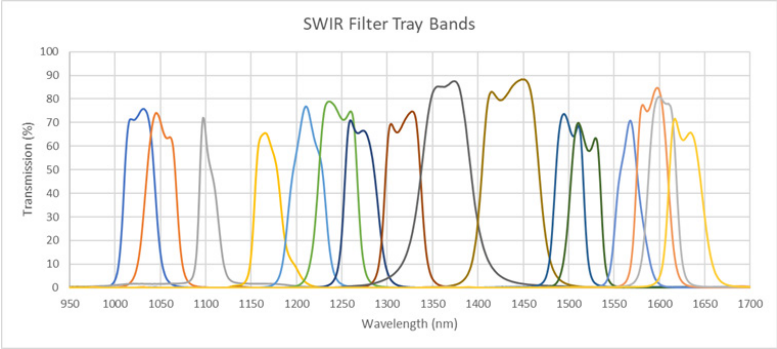




Broadband SWIR imagery (left) shows targets ranging from 1.5 km to 3 km, but not the target over 10 km distant near the tree line. Spectral anomaly detection highlights all targets.

SPECIFICATIONS

Spectral Range (nm)	900 - 1700
Spectral Resolution (nm)	25 (average)
Spectral Bands	16
Spatial Resolution	320 x 256
Sensor	InGaAs
Data Cube Collection Rate	30 fps
Pixel Pitch (um)	12 (Spectral); 48 (Spatial)
Aperture (F/#)	2.7
Lens focal length	100 mm



Spectral response for standard filter tray (center/ FWHM): 1030/30, 1050/25, 1090/18, 1168/27, 1203/35, 1238/26, 1273/29, 1308/32, 1356/56, 1445/67, 1490/26, 1520/25, 1565/20, 1590/32, 1610/30, 1640/35

OEM CUSTOMIZATION

Surface Optics specializes in application-driven imaging system design, manufacturing, and support. LightShift™ OEM services include:

- Initial spectral data collection and reduction for modeling imaging system performance
- Filter array design and manufacturing
- Camera housing and mechanical design for environmental considerations
- Proof-of-concept prototyping to high-volume production
- System assembly, alignment, calibration and testing
- Software GUI and spectral algorithm development

SURFACE OPTICS
CORPORATION

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With over 40 years as a global leader in technology for optical property characterization, Surface Optics Corporation is located in San Diego, CA and offers a single engineering and manufacturing source for solutions requiring application, characterization, or control of the optical properties of surfaces.

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