LONG-RANGE STABILIZED ELECTRO-OPTICAL SURVEILLANCE SYSTEM

Product brochure

THE PROBLEM

Surveillance is the primary building block of situational awareness.

Military, paramilitary, HLS, law enforcement and security organizations require cost-effective, versatile surveillance and targeting systems that are easy to install, maintain and operate, to provide input for their situational awareness picture and support their tactical operations.

Systems and payloads incorporating optical and thermal sensors combined with active targeting measures are currently the norm for cutting-edge surveillance in the air, at sea and on the ground, and are employed in an extensive range of defense, HLS and combat applications.

The ultimate objective of multiple-sensor surveillance systems is versatility – the same system/payload should be able to fulfill as many surveillance and targeting functions as possible: daytime and night surveillance, range measurement and targeting.

Various defense, security and HLS activities such as border defense, vital installation security and coastal defense require permanent or ad-hoc coverage by long-range surveillance systems.

THE SOLUTION

ACS presents LRSEOSS – Long-Range Stabilized Electro-Optical Surveillance System.

LRSEOSS consists of three primary elements: a gyro-stabilized pan & tilt assembly capable of accommodating different sensor combinations (e.g. thermal imagers, daytime cameras and Laser modules); technical infrastructure (cables, converters & interfaces) and a control sub-system (servers, displays and user interface units).

LRSEOSS adheres to the basic principles of reliable operation, simplified maintenance and operation, modular design and superior performance.

The sensor unit of LRSEOSS contains an IR sensor for night operation, a daytime and/or low-light sensor and a Laser module. The Laser module consists of a Laser Range Finder (LRF) and a Laser pointer. A Laser illuminator is optional.

LRSEOSS provides the user with a comprehensive range of surveillance and targeting capabilities: motion detection, target locating & classification, range measurement, target tracking, panoramic displays, video stabilization and image fusion.

Additionally, LRSEOSS features state-of-the-art image processing capabilities: contrast enhancement, color restoration, turbulence mitigation, image sharpening and edge enhancement.

LRSEOSS offers a cutting-edge solution to such defense, HLS and security activities as border area monitoring, intelligence gathering, coastal surveillance and installation/vital infrastructure security.

KEY FEATURES & MAJOR ADVANTAGES

Key Features & Major Advantages

- State-of-the-art long-range electro-optical surveillance system for land & coastal applications
- Target detection & classification
- Day/night & all-weather operation
- Range measurement & targeting
- Motion detection
- Target locating & tracking
- Panoramic view display
- Advanced image processing (contrast enhancement, color restoration, turbulence mitigation, edge enhancement)
- Video stabilization
- Image fusion
- Primary applications:
  - Border area surveillance
  - Coastal surveillance
  - Vital infrastructure/installation security
- Specifications:
  - Overall weight: 55 kg
  - Weight of pan & tilt assembly: approximately 28 kg
  - Dimensions: 640mm x 640mm x 700mm
  - Azimuth coverage: 360° continuous
  - Elevation coverage: +25° to -45°
  - Stabilization: dual gimbal, dual axis stabilized system based on fiber-optic gyroscopes – less than 5 µRad RMS

Sensor Parameters

Module	Characteristic	Value
IR Module	Detector	InSb FPA, 3÷5µm
	Resolution	640X480 **OR** 1280X1024
	Focal Length (mm)	60 ÷ 1400
	FOVs	0.4° to 9° (for 640X480)

		Typical Recognition Range for 2.3 x 2.3 m² target	20 km
Day SWIR EMCCD Module	Narrow FOV TV	Detector	B/W or color CCD, 1/3″, 1/4″ or 2/3″
		Resolution	752X582 (1920X1080 optional)
		Zoom	X4
		Focal Length (mm)	380÷1620
		Field Of View (H)	0.12° to 0.46° (for 1/4″)
		Typical Recognition Range for 2.3 x 2.3 m² target	25 km
	Wide FOV TV	Detector	CCD 1/4″
		Continuous Zoom	34X
		Field Of View (FOV) (H)	1.7° to 58°
	EMCCD (Electron Multiplied CCD) Camera	Detector	EMCCD B/W 1/2″
		Focal Length (mm)	380÷1620
		Sensitivity (minimum illumination)	Less than 10^{-4} lux
		Field Of View (H)	0.26° to 1.1°
		Typical Recognition of Ship Name **with Laser Illuminator**	3 km
	SWIR (Short Wave Infrared) Camera	Detector	InGaAs, 0.9÷1.7 µm
		Focal Length (mm)	500÷2100
		Field Of View (H)	0.25° to 1°
		Typical Recognition Range for 2.3 x 2.3 m² target	25 km

LASER Module	Laser Illuminator (used with EMCCD)	Wavelength	810 – 865 nm
		Horizontal Beam Divergence	<4 mRad
		Vertical Beam Divergence	<2 mRad
		Output Power	1.75 – 2.0 W Continuous
		Operational Mode	Pulsed or continuous
	Laser Rangefinder	Wavelength	1.54 mm (Eye-safe)
		Beam Divergence	0.5 mRad nominal
		Pulse Rate	Up to 1 PPS
		Effective Range	Up to 20 km
		Range Accuracy	± 5 m
	Laser Pointer	Wavelength	0.83 mm
		Beam Divergence	0.5 mRad nominal
		Effective Pointing Range	10 km