spectral camera LWIR

PRISM AWARDS FINALIST 2010

SPECIM presents its thermal hyperspectral cameras in the LWIR region 8 to 14 µm. Three camera models have been specially designed to meet diverse requirements in industrial, research and security applications.

Spectral Camera LWIR HS with uncooled detector

Spectral Camera LWIR C with cryo-cooled MCT detector

Applications

Geological mapping
Mineral classification
Volcanology
Water temperature
Camouflage detection
Gas detection
Flame analysis
Land cover type recognition

SPECIM´s LWIR Spectral Cameras are push-broom type line scan cameras that provide full, contiguous hyperspectral data for each pixel along the imaged line. To respond to a wide range of applications and requirements, SPECIM has developed 3 models of LWIR Spectral Cameras: HS and HR (with uncooled detectors), and C (with cooled detector).

HS AND HR MODELS

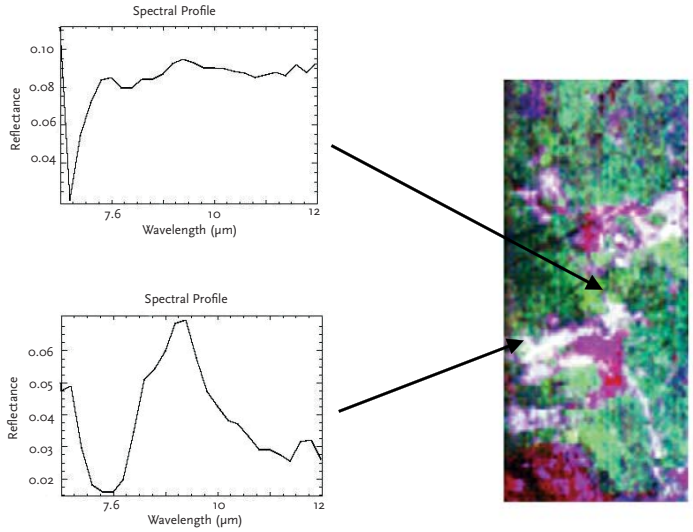
Spectral Cameras LWIR HS and HR integrate an uncooled detector and optics. They are compact (only 3.5kg) and versatile tools for a wide variety of applications.

HS (high sensitivity model) covers the spectral range 8-12 µm. It has 30 spectral bands and spectral sampling of 200 nm. With a good sensitivity and moderate spectral resolution, HS is suitable for many industrial and Chemical Imaging applications.

HR (high resolution model) covers the range 8-14 µm and is designed for applications that require high spectral resolution. With spectral sampling of 70 nm and 85 bands, HR is a solution for applications where the targets emit at higher than normal ambient temperatures or where an IR source is used to illuminate the sample. Application examples include gas emission analysis and infrared Chemical Imaging.

C MODEL

For the most demanding ground-based remote sensing and security applications, SPECIM has integrated a state-of-the-art temperature stabilized LWIR imaging spectrograph with the highest sensitivity cooled MCT detector. Spectral Camera LWIR C covers the spectral range 8 to 12 µm with high spectral selectivity of 84 bands (sampling of 48 nm) and extensive speed of up to 100 images/s.



Mineral sample scanned with Spectral Camera LWIR HS. The plots show examples of reflectance spectra.

SPECTRAL CAMERAS LWIR

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Performance Specifications

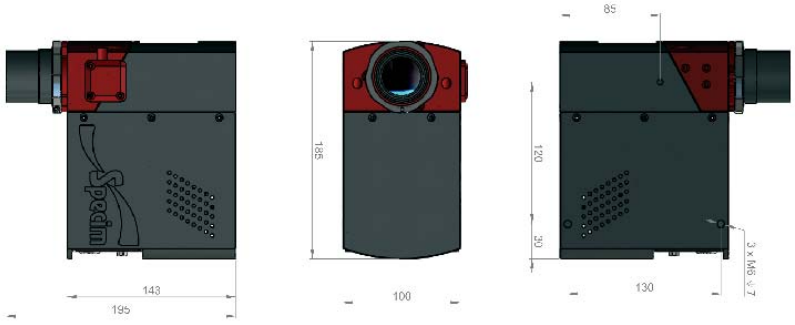
SPECTRAL CAMERA LWIR	C	HR (PRELIMINARY)	HS
Optical characteristics			
Spectral range	8 - 12 µm	8 - 14 µm	8 - 12 µm
Spectral bands	84	85	30
Spectral resolution	100 nm**	100 nm **	400 nm
Spectral sampling/band	48 nm	70 nm	200 nm
Spatial pixels	384 pixels		
Field of view	With fore lens L43***: 24 °		With fore lens L62***:30 °
Spatial sampling	0.063 °		0.079 °
Aberrations	Insignificant astigmatism, smile or keystone < 0.1 pixels		
Optics temperature	Stabilized	Uncooled	
Electrical characteristics			
Detector	MCT		LWIR uncooled microbolometers
Numerical aperture	F/2.0		F/1.0
Pixel size			35 x 35 µm
Cooling	Stirling-cycle cooler		Uncooled
Camera output	14-bit LVDS		14-bit LVDS
Frame grabber	NI-PCI 1422 or 1424 National Instruments		
Frame rate	up to 100 fps		60 fps
Shutter/internal calibration	Yes		
Power consumption	< 200 W		3.5 W
SNR	Target 300 K * 8 µm 450 * 10 µm 580 * 12 µm 230	Target 800 K * 8 µm 530 * 10 µm 402 * 12 µm 150	Target 400 K * 8 µm 240 * 10 µm 210 * 12 µm 180
NESR (mW/m2srµm)	* 8 µm 21 * 10 µm 18 * 12 µm 40	* 8 µm 2130 * 10 µm 1540 * 12 µm 2470	* 8 µm 171 * 10 µm 161 * 12 µm 139
NETD/ spectral pixel	* 0.2K		
Mechanical characteristics			
Size (mm)	175 x 285 x 200	100 x 143 x 185	100 x 143 x 185
Weight (kg)	8.5	3.5	3.5
Body	Anodized aluminium and painted steel		
Environmental characteristics			
Storage	- 20 ... +50 °C		
Operating	+ 5 ... +40 °C, non-condensing		

* x 2 software binning

** Diffraction limited

*** Other fore lenses available upon request. Fore lenses can be replaced by the customer.

Specifications subject to change without prior notice



Dimensions (mm) and mechanical interface of Spectral Cameras LWIR HS and HR