# Spectral Camera
## LWIR

GILDEN
photonics

Spectral camera LWIR HS
with uncooled detector

**Gilden Photonics and Specim presents its thermal hyper-spectral cameras in the unique LWIR region 8 to 14 µm. Three camera models have been specially designed to meet diverse requirements in industrial, research and security applications**

## THERMAL HYPER-SPECTRAL CAMERAS IN THE LONG WAVE INFRA RED (LWIR) RANGE 8 TO 14 µM

LWIR Spectral Cameras are push-broom type line scan cameras that provide full, contiguous hyper-spectral data for each pixel along the imaged line. To respond to a wide range of applications and requirements, from 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 and light weighs is only 3.5kg, and such are 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

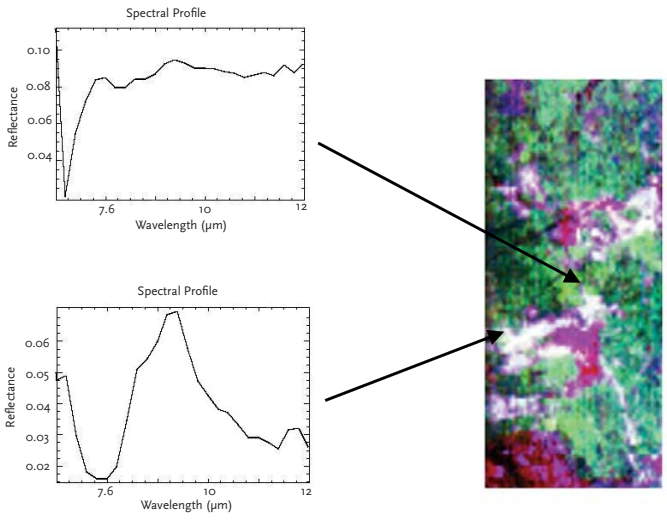
For the most demanding ground-based remote sensing and security applications, SPECIM has integrated a state-of-the-art temperature stabilized LWIR imaging spectrograph with the highest sensitivity cooled MCT detector. Spectral Camera LWIR C covers the spectral range 8 to 12 µm with high spectral selectivity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

## APPLICATION

Geological mapping mineral classification volcanology water temperature
Camouflage detection
Gas detection
Flame analysis
Land cover type recognition

**Specially designed to meet diverse demands**

Spectral camera LWIR C with
cryo-cooled MCT detector



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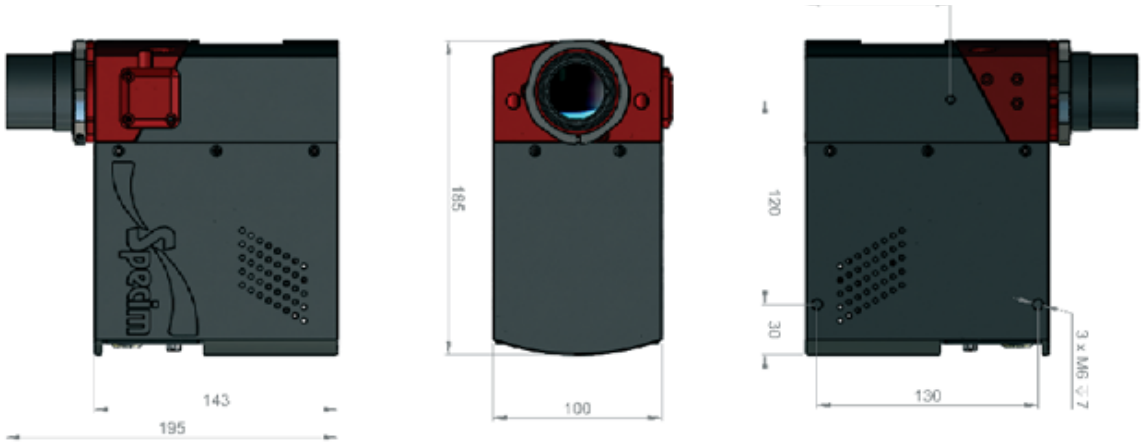
## LWIR




| SPECTRAL CAMERA LWIR | | | | |
|---|---|---|---|---|
| **OPTICAL CHARACTERISTICS** | **C** | **HR** | **HS** | **UNIT** |
| Spectral Range | 8 –12 | 8 – 14 | 8 – 12 | µm |
| Spectral Bans | 84 | 85 | 30 | – |
| Spectral Resolution | 100 ** | 100 ** | 400 | nm |
| Spectral Sampling/Band | 48 | 70 | 200 | nm |
| Spatial Pixels | 384 pixels | | | – |
| Field of View | with fore fens 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 | 24 × 24 | 35 × 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 | 60 | | fps |
| Shutter/ Internal Calibration | yes | | | – |
| Power Consumption | < 200 | 3.5 | | W |

| SPECTRAL CAMERA<br>LWIR | | | | |
|---|---|---|---|---|
| **ELECTRICAL CHARACTERISTICS** | | | | |
| SNR | target @ 300 K<br>*8 µm 450<br>*10 µm 580<br>*12 µm 40 | target @ 800 K<br>*8 µm 530<br>*10 µm 402<br>*12 µm 150 | target @ 400 K<br>*8 µm 240<br>*10 µm 210<br>*12 µm 180 | µm |
| NESR (mW/ $m^2$ srµm) | *8 µm 21<br>*10 µm 18<br>*12 µm 40 | *8 µm 2130<br>*10 µm 1540<br>*12 µm 2470 | *8 µm 171<br>*10 µm 161<br>*12 µm 139 | µm |
| NETD/ Spectral Pixel | * 0.2 | | | **K** |
| **MECHANICAL CHARACTERISTICS** | | | | |
| Size | 175 × 285 × 200 | 100 × 143 × 185 | 100 × 143 ×185 | $mm^3$ |
| Weight | 8.5 | 3.5 | 3.5 | kg |
| 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.

Custom hyper-spectral scanning, illumination and enclosure systems are available for your application.
Contact Gilden Photonics or our official distributors for more information.