



The automated 3-position filter mechanism.

## HIGH-DYNAMIC-RANGE INFRARED CAMERAS.

The HDR-IR infrared cameras cover extended scene temperature ranges. These cameras maximize camera sensitivity for any static or dynamic scene. With their unique AEC+ (fast ND-Swap capability), these cameras find the best exposure time depending on the scene, and allow to resolve targets up to 2 500°C automatically.

### KEY BENEFITS

#### ULTRA HIGH DYNAMIC RANGE

Unique Telops proprietary non-linearity correction and exposure time independent calibration algorithms ensure observation of scene targets with the highest possible contrast and accuracy. Fast automated attenuation filters are also included to measure scenes with extreme temperature variations.

#### HIGH DATA RATE

High-performance electronics produce full-frame thermal images at rates up to 300 fps.

#### ADVANCED CALIBRATION

Real-time processing of infrared images including NUC, radiometric temperature, automated exposure control (AEC) and enhanced high-dynamic-range imaging (EHDR).

#### ACCURATE MEASUREMENT

Radiometric temperature accuracy of  $\pm 1$  °C or  $\pm 1$  % over the entire range.

### EXAMPLES OF TYPICAL USES

Tank Muzzle Flash Analysis



Sparkle combustion analysis



<b>MIDWAVE SERIES</b>			
<b>DETECTOR SPECIFICATIONS</b>	HDR M2k	HDR M100k	HDR M350
DETECTOR TYPE	InSb	MCT	InSb
SPECTRAL RANGE	3 $\mu\text{m}$ to 5.4 $\mu\text{m}$	3 $\mu\text{m}$ to 4.9 $\mu\text{m}$	3 $\mu\text{m}$ to 5 $\mu\text{m}$
SPATIAL RESOLUTION	320 $\times$ 256 pixels	640 $\times$ 512 pixels	640 $\times$ 512 pixels
DETECTOR PITCH	30 $\mu\text{m}$	16 $\mu\text{m}$	15 $\mu\text{m}$
APERTURE SIZE	F/2.5	F/4	F/3
<b>TYPICAL PERFORMANCES</b>			
FRAME RATE	2 000 Hz	115 Hz	350 Hz
MAXIMUM FRAME RATE (STATIC FILTER WHEEL MODE)	90 000 Hz @ 64 $\times$ 4	120 000 Hz @ 64 $\times$ 2	4 900 Hz @ 64 $\times$ 2
TYPICAL NETD	25 mK	17 mK	20 mK
<b>ELECTRONIC SPECIFICATIONS</b>			
EXPOSURE TIME	1 $\mu\text{s}$ to full frame rate	0.2 $\mu\text{s}$ to full frame rate	0.5 $\mu\text{s}$ to full frame rate
<b>CAMERA CONSTRUCTION</b>			
LENS MOUNT	Bayonet interface	Bayonet interface	Bayonet interface

<b>MIDWAVE <i>hd</i> SERIES</b>		
<b>DETECTOR SPECIFICATIONS</b>	HDR M200 <i>hd</i>	HDR M100 <i>hd</i>
DETECTOR TYPE	InSb	MCT
SPECTRAL RANGE	3 $\mu\text{m}$ to 5 $\mu\text{m}$	3.7 $\mu\text{m}$ to 4.8 $\mu\text{m}$
SPATIAL RESOLUTION	1280 $\times$ 1024 pixels	1280 $\times$ 1024 pixels
DETECTOR PITCH	15 $\mu\text{m}$	15 $\mu\text{m}$
APERTURE SIZE	F/3	F/3
<b>TYPICAL PERFORMANCES</b>		
FRAME RATE	105 Hz	50 Hz
MAXIMUM FRAME RATE (STATIC FILTER WHEEL MODE)	2 900 Hz @ 136 $\times$ 8	18 000 Hz @ 264 $\times$ 4
TYPICAL NETD	20 mK	25 mK
<b>ELECTRONIC SPECIFICATIONS</b>		
EXPOSURE TIME	1 $\mu\text{s}$ to full frame rate	16 $\mu\text{s}$ to full frame rate
<b>CAMERA CONSTRUCTION</b>		
LENS MOUNT	Bayonet interface	Bayonet interface

## VERY LONG WAVE SERIES

DETECTOR SPECIFICATIONS	HDR V300
DETECTOR TYPE	MCT
SPECTRAL RANGE	7.7 $\mu\text{m}$ to 11.8 $\mu\text{m}$
SPATIAL RESOLUTION	320 $\times$ 256 pixels
DETECTOR PITCH	30 $\mu\text{m}$
APERTURE SIZE	F/2
TYPICAL PERFORMANCES	
FRAME RATE	300 Hz
MAXIMUM FRAME RATE (STATIC FILTER WHEEL MODE)	79 000 Hz @ 64 $\times$ 2
TYPICAL NETD	25 mK
ELECTRONIC SPECIFICATIONS	
EXPOSURE TIME	0.5 $\mu\text{s}$ to full frame rate
CAMERA CONSTRUCTION	
LENS MOUNT	Threaded interface

Specifications are subject to change without notice. Other configurations are available upon request.



### COMMON SPECS

SENSOR COOLING	Rotary-stirling closed cycle
STANDARD SCENE TEMPERATURE RANGE	Up to 1 500 $^{\circ}\text{C}$
WINDOWING TO INCREASE FRAME RATE	Yes
DYNAMIC RANGE	16 bits
MEASUREMENT ACCURACY	1 K or 1 % ( $^{\circ}\text{C}$ ) from -15 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$
SIZE W/O LENS	13.8" $\times$ 8.5" $\times$ 9.3" 352 mm $\times$ 216 mm $\times$ 236 mm
WEIGHT W/O LENS	< 13 kg

**FOR MORE INFORMATION | [TELOPS.COM](http://TELOPS.COM)**

**TELOPS HEADQUARTERS**  
contact@telops.com  
Tel.: +1 (418) 864-7808

**TELOPS USA**  
vince.morton@telops.com  
Tel.: +1 (831) 419-7507

**TELOPS EUROPE**  
eric.guyot@telops.com  
Tel.: +33 1 70 27 71 34

**TELOPS CHINA**  
luoyi@telops.com  
Tel.: +86 139 1065 8965

## ABOUT US

Telops is a leading supplier of high-performance scientific infrared cameras for the defence, academic, industrial, and environmental research industries. Telops also offers R&D services for optical systems technology development.

Since its beginning in 2000, Telops has distinguished itself with the quality of its technical personnel and its innovative approach to many technological challenges in the optics field. Today, the expertise of its scientists, engineers and technologists and the performances of its infrared cameras and hyperspectral imagers are internationally recognized.



Quebec City's Château Frontenac in infrared

## FEATURES & OPTIONS



### OUR INFRARED CAMERAS' KEY FEATURES

All our infrared cameras offer advanced features to address the most demanding research applications. They include:

- Blackbody-free permanent calibration
- Calibration up to 2500 °C (optional)
- High-speed internal memory buffer: up to 16 GB
- Gig-E
- Camera Link
- Trigger In, Trigger Out
- SDI, GPS, IRIG-B, RS232 and thermistor ports
- Lock-In (optional)
- Automatic exposure control (AEC)
- Enhanced high-dynamic-range imaging (EHDMI)

### OUR INFRARED CAMERAS' LENS OPTIONS

Telops offers a variety of lens options depending on your camera configuration using either a flanged, threaded, or bayonet mount interface.

Customized optics are available, as well as many accessories such as telescopes and microscopes.