

Imagine the invisible

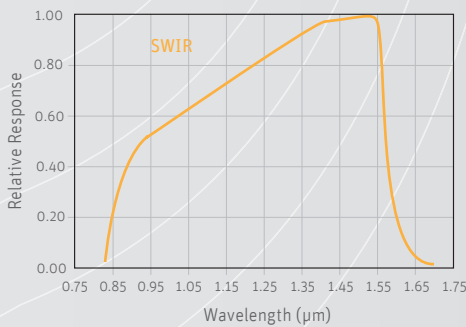
Scientific



# Cougar-640

LN2 cooled high resolution SWIR camera

Designed to have the lowest noise and highest sensitivity for low-light-level measurements



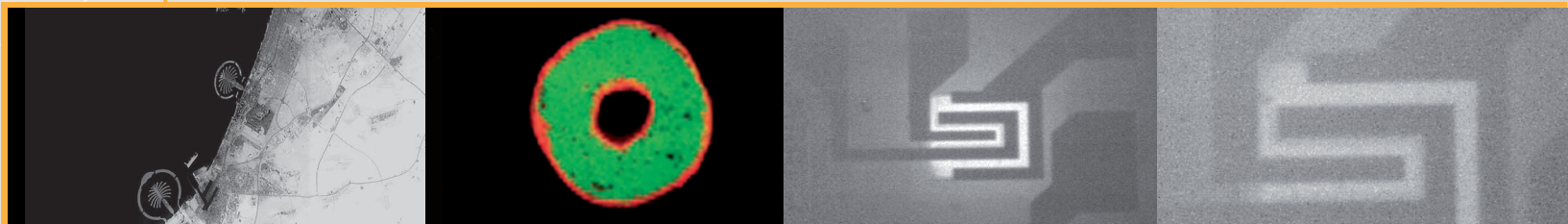
The Cougar-640 excels in performance for any R&D spectroscopy or semiconductor failure analysis task. These demanding applications, where very low light levels need to be measured, require cameras with low dark current, low noise and best response in the SWIR range. All of these features are now combined in one single camera.

topology for ultra-low noise levels ever seen (15 e-). Integration time of several hours is possible with the RWI (Read While Integrate) feature with non-destructive readout and very low dark current of less than 10e-/second.

The Cougar-640 features a high image resolution of 640 x 512 with a 20 µm pixel pitch and full 24 bit ADC. Camera interfacing is provided via standard CameraLink for ease of integration.

The in-house developed InGaAs detector of the Cougar-640 is optimized for 77K operation, using Liquid Nitrogen (LN2) cooling and is based on a SFD (Source Follower per Detector) read-out

Designed for use in



⌘ Astronomy

⌘ Lab spectroscopy

⌘ Photon emission 10x zoom

⌘ Photon emission 20x zoom

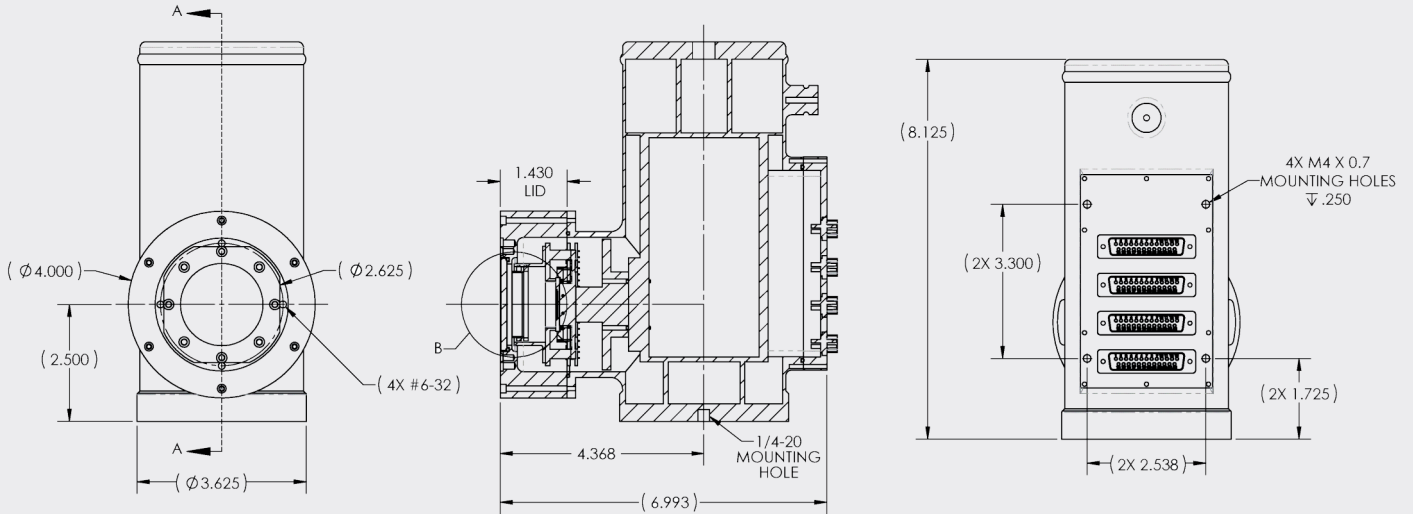
## Applications

- Astronomy
- Raman spectroscopy
- Low light level SWIR imaging
- High resolution imaging spectroscopy
- Failure analysis via photon emission or electro-luminescence

## Benefits & Features

- Lowest noise
- High sensitivity
- Low dark current
- Windowing for enhanced focusing
- Measuring extreme low light signals
- Extreme long integration time with non-destructive readout

## Technical drawings of electronics housing and Dewar



## Specifications

Camera specifications	Cougar-640
Lens (not included)	
Optical interface	Custom lens mount
Imaging performance	
Frame rate (full frame)	1.42 Hz
Window of Interest	Minimum size 2 x 4 pixels
Exposure time range	Illuminated mode with ITR: 12.5 ns – 53.7 sec Emission mode with RWI: 0.7 sec – till saturation
Full well	400.000 e <sup>-</sup>
Gain (e <sup>-</sup> /ADU count)	2.2 $\mu$ V/e <sup>-</sup>
Noise	15 e <sup>-</sup> (@T=77K in RWI mode)
Dark current	< 10 e <sup>-</sup> /s (@ T=77K)
A to D conversion resolution	24 bit
Interfaces	
Camera control	CameraLink
Image acquisition	Base CameraLink (24 bit)
Trigger	3.3 V CMOS levels (trigger in & out)
Power requirements	
Power consumption	< 600 mA
Power supply	12 V
Physical characteristics	
Dimensions electronics housing	100 W x 130 H x 40 L mm <sup>3</sup>
Dimensions Dewar	93 W x 207 H x 178 L mm <sup>3</sup>
Weight electronics module	0.6 kg
Weight Dewar	2.1 kg

Array specifications	XFPA-1.7-640-LN2
Array Type	InGaAs
Spectral band	0.9 to 1.7 $\mu$ m @ room temperature 0.9 to 1.55 $\mu$ m @ 77K cooling
# Pixels	640 x 512
Pixel Pitch	20 $\mu$ m x 20 $\mu$ m
Array Cooling	LN2 (77K)
Pixel clock frequency	125 kHz
Pixel operability	> 98%

## Product selector guide

Part number	Cooling	Digital output interface	Frame rate (Hz)	ADC
XEN-000076	LN2 (77K)	CameraLink	1.42	24 bit