



C-RED 2

Data Sheet

February 2018

FAST LOW NOISE InGaAs CAMERA



MAIN FEATURES

- 640 X 512 InGaAs sensor
- 0.9 μm to 1.7 μm (70% QE)
- 15 μm pixel pitch
- Windowing
- Cooled sensor operation for low dark
- USB3 interface or CameraLink for better performances
- Optical interface: C-Mount
- On Board IMRO mode
- On Board Non Uniformity Correction:
 - Bias
 - Flat
 - Bad Pixels
- 400 FPS Full Frame
- < 30 e- Read Out Noise
- < 5 μs electronic shutter
- Cooling: Air or Liquid (Ambiant)
- Size: L 140 mm x W 75 mm x H 55 mm
- Weight: 0.9 kg



THEORY OF OPERATION

C-RED 2 is a revolutionary ultra high speed low noise camera designed for high resolution Short Wave InfraRed imaging. Thanks to its state of the art electronics, software, and innovative mechanics, C-RED 2 is capable of unprecedented performances: up to 400 images per second with a read out noise under 30 electrons.

To achieve these breakthrough performances, C-RED 2 integrates a 640 x 512 InGaAs PIN Photodiode detector with 15 μm pixel pitch for high resolution, which embeds an electronic shutter with integration pulses shorter than 5 μs . C-RED 2 is also capable of windowing, allowing faster image rate while maintaining a very low noise, and multiple on board functionalities (cf. Frame Rate Table below).

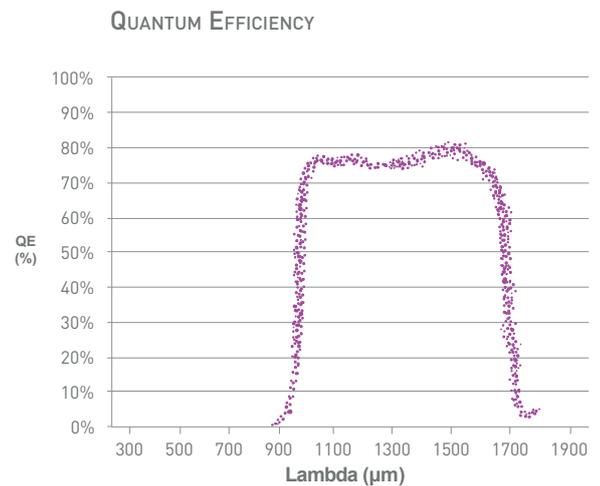
The software allows real time applications, and the interface is CameraLink full and superspeed USB3.

C-RED 2 is designed to be updated remotely, and needs no human assistance to manage the cooling. The camera can operate in very low-light conditions as well as remote locations.

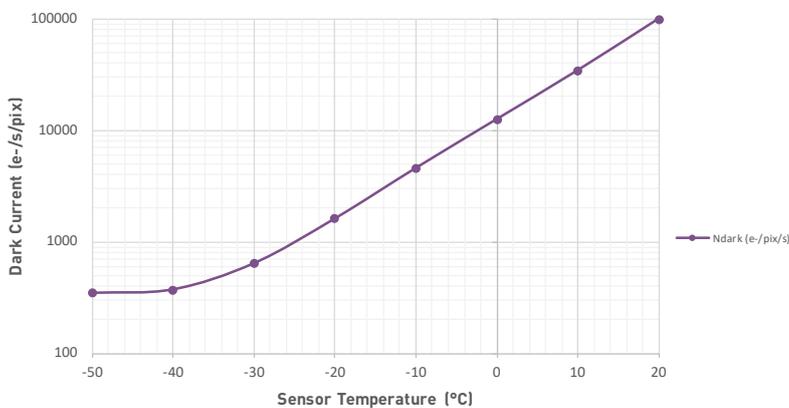
Designed for high-end SWIR applications, smart and compact, C-RED 2 is operating from 0.9 to 1.7 μm with a very good Quantum Efficiency over 70%, offering new opportunities for industrial or scientific applications.

C-RED 2 PERFORMANCES

Test measurement	Result	Unit
Maximum speed Full Frame	400	FPS
Readout Noise at 400 fps	< 30	e-
Quantization	14	bit
Detector Operating Temperature	-40	C°
Flat Quantum Efficiency from 0.9 to 1.7 μm	> 70	%
Operability	99.5	%
Image Full well capacity at low gain, 400 fps	1400	ke-
Image Full well capacity at high gain, 400 fps	43	ke-
Maximum speed in 32 x 4 (min)	21478	FPS
Maximum speed in 320 x 256	1192	FPS



MEASURED RESULTS

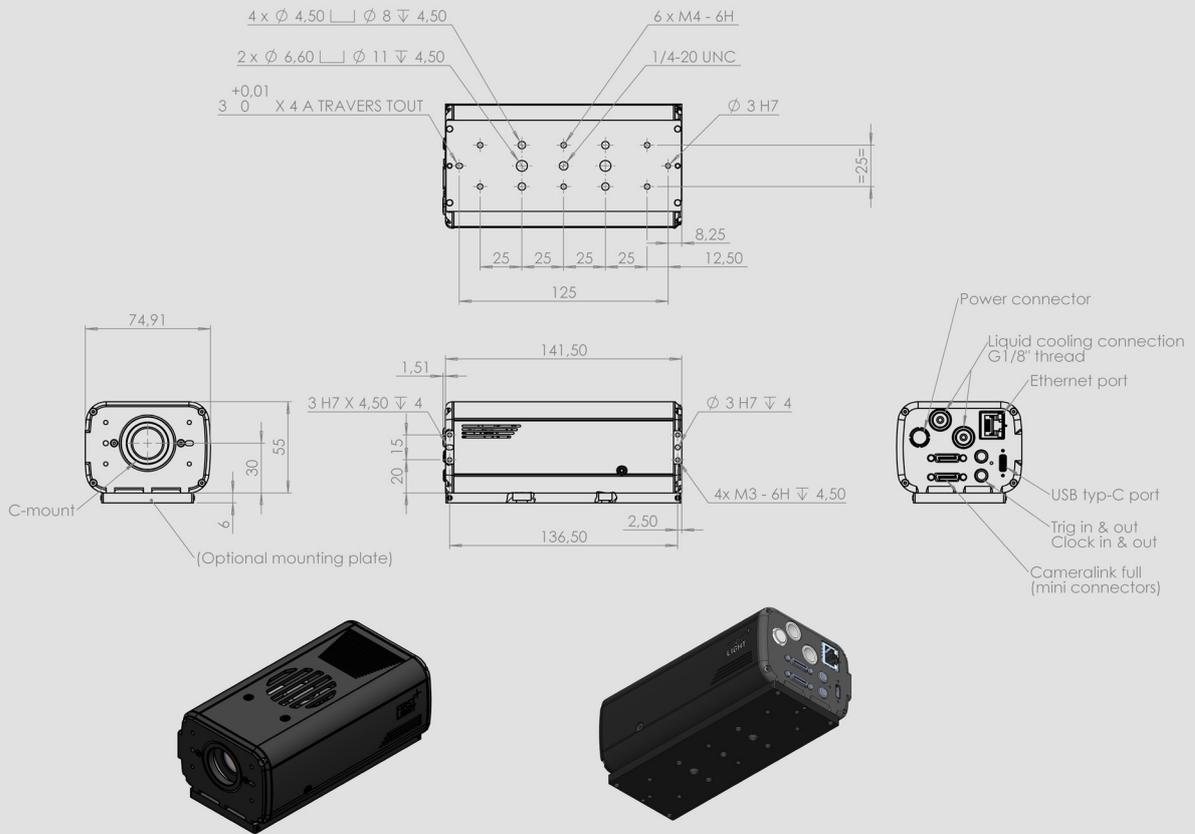


FRAME RATE TABLE (FPS)

		Columns					
		32	64	128	256	512	640
Lines	4	21 478	21 107	20 401	19 122	16 991	16 094
	8	18 827	18 318	17 378	15 762	13 289	12 323
	16	15 099	14 489	13 406	11 663	9 256	8 390
	32	10 815	10 217	9 200	7 672	5 760	5 121
	64	6 900	6 427	5 653	4 555	3 281	2 878
	128	4 002	3 690	3 192	2 513	1 763	1 534
	256	2 175	1 992	1 706	1 325	916	793
	512	1 137	1 037	883	681	467	403



C-RED 2



APPLICATIONS

- Adaptive Optics for Astronomy
- Astronomical Observations
- Hyper Spectral Imaging
- Spectroscopy
- Raman Spectroscopy
- Laser Communications
- Semiconductor Inspection
- Solar Cells Inspection
- OCT Imaging
- Bio Imagery
- Quality control
- Production control

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OUR COMPANY

First Light Imaging designs and manufactures state of the art scientific cameras that combine extreme sensitivity and high speed for both visible and infrared spectra.

Coming from European academic research institutes, already multiple award-winning, First Light Imaging is recognized for the high performance of its products.

We develop our cameras around cutting-edge sensors. EMCCD, e-APD or InGaAs, we integrate the most challenging, difficult to harness detectors in complex optics systems.

Already at the heart of the Adaptive Optics systems for the world's biggest telescopes, our technology and detectors are also used in Medical Imagery and Industry.



First Light Imaging SAS

Europarc Sainte Victoire Bât 6,
Route de Valbrillant, Le Canet
13590 Meyreuil FRANCE
Tel.: + 33 4 42 61 29 20
www.first-light.fr
contact@first-light.fr

First Light Imaging Corp.

2415 Third Street, Suite 231
San Francisco, CA 94107
USA
www.first-light.us



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