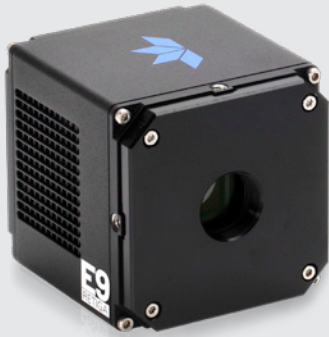


RETIGA E9 CMOS CAMERA



KEY FEATURES

- Long exposure CMOS, capable of exposures up to 10 hour
- Ultra-low dark current due to advanced thermal control
- High-resolution 9 MP sensor
- 3.76 μm pixels
- 26 fps imaging speed
- Large dynamic range to capture a range of dim and bright signals
- >90% quantum efficiency

TYPICAL APPLICATIONS

- Live cell imaging
- Gel documentation
- Spatial biology
- Luminescence
- Multispectral imaging
- Micro-plate readers
- Fluorescence microscopy

RELIABILITY

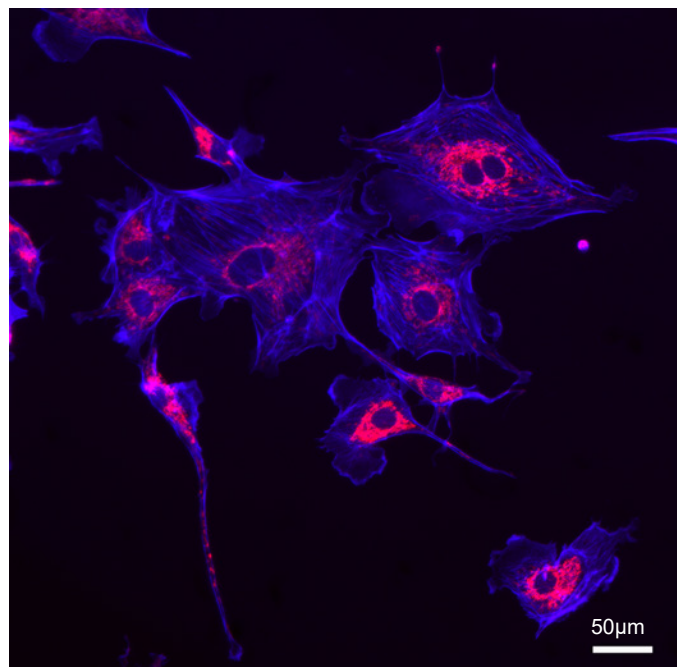
- Three-year warranty
- Extended warranty available

High Sensitivity, Low Dark Current, High Pixel Count sCMOS Camera

The Teledyne Retiga E9, a next-generation scientific CMOS camera, delivers exceptional performance for demanding imaging applications. Featuring high quantum efficiency, low noise, and long exposure capability, the E9 is built on advanced stacked CMOS technology which provides both high full well capacity, low readout noise and ultra-low dark current – with thermal noise performance allowing exposures of hours, not seconds.

Its small pixel size is optimized for low magnification, high numerical aperture (NA) imaging, achieving a peak QE over 90% to capture nearly every photon. Designed with OEM integration in mind, the Retiga E9 has a small form factor, onboard triggering, and cross-platform support for Windows and Linux.

The E9 joins the trusted Retiga E7 and E20 in Teledyne's proven Retiga family—robust cameras designed for scientific, biomedical, and advanced imaging applications.



Cells labeled with Phalloidin (blue) and MitotrackerRed (red) were imaged with a 20x 0.7NA lens. The field of view in the sample is approximately 800 μm diagonal and the scale bar is 50 μm long.

RETIGA E9 SPECIFICATIONS

SPECIFICATIONS	Camera Performance
Sensor	Sony IMX533 CMOS sensor
Active Array Size	3000 x 3000 (9 Megapixel)
Pixel Area	3.76 μm x 3.76 μm (14.1 μm^2)
Sensor Area	11.3 mm x 11.3 mm (16 mm diagonal)
Peak QE%	> 90% at 550 nm
Dark Current	2 x 10 ⁻⁵ e ⁻ /p/sec
Readout Modes	Rolling shutter
Digital Binning	2 x 2, 3 x 3, 4 x 4, 8 x 8 and 16 x 16
Linearity	> 99%
Cooling Options	Air cooling to -25 °C at ambient temperatures < 30 °C
Digital Interfaces	USB 3.2 Gen 1(10 Gbps)
Lens Interfaces	C-mount
Mounting Points	1/4" - 20 TPI mount point on each side
Camera Weight	0.8 kg, 1.76 lbs
Camera I/O	Read out Trigger ready Exposure Out (all rows, any row, rolling shutter) Trigger in (first, edge, level)

CAMERA MODES

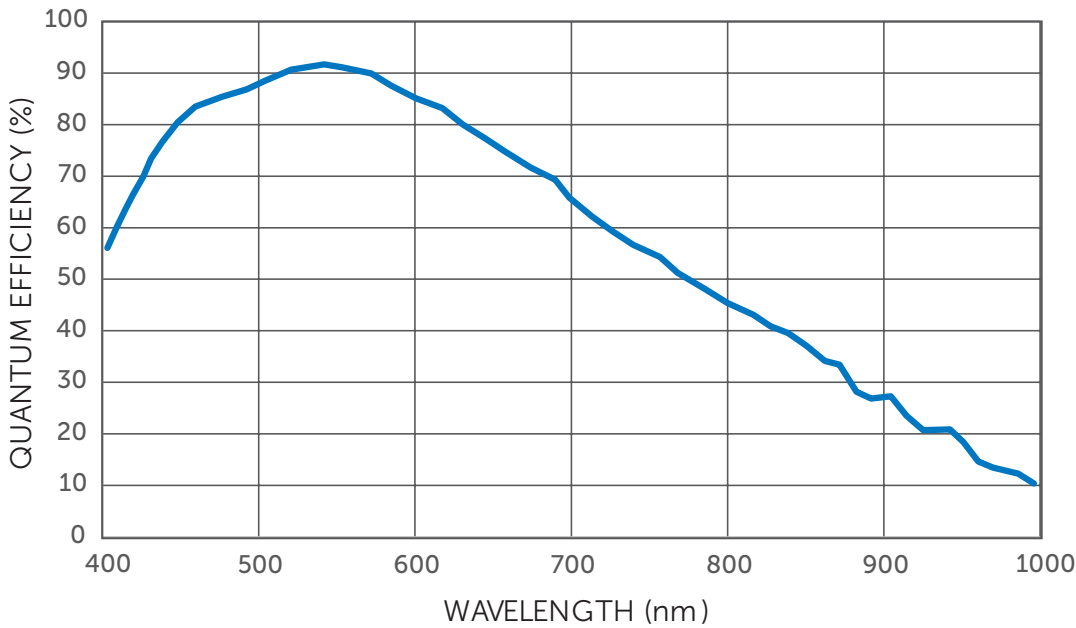
SPECIFICATIONS	Full Well	Balanced	Sensitivity
Full Well Capacity e ⁻	50 ke ⁻	16.5 ke ⁻	2000 e ⁻
Read Noise e ⁻	3.4 e ⁻	1.3 e ⁻	0.8 e ⁻
Conversion gain e ⁻ /gray	0.76	0.25	0.03
Dynamic Range	83.3 dB 14700	82.0 dB 12690	68.0 dB 2500

ROI SPEEDS

Region of interest in rows	Measured Frame Rates	
	Startech card 3m C-C cable	USB 3.0 native port 0.9m A-C cable
3000	26.8	25.3
1024	76.1	74.5
512	145.7	146.2
256	268.5	269.4
128	463.8	465.4

* The Retiga E9 is a rolling shutter camera so binning does not alter the frame rate.

RETIGA E9 QE CURVE

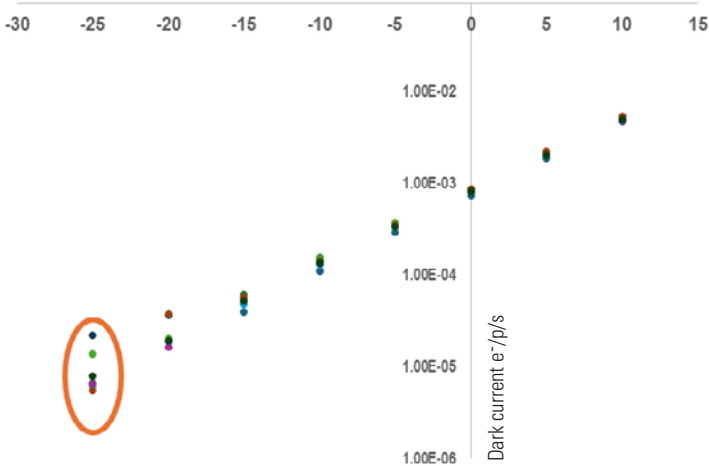


RESOLUTION (550 nm)

NA	0.1	0.2	0.3	0.4	0.6	0.8
Optical resolution (µm)	3.36	1.68	1.12	0.84	0.56	0.42
Ideal pixel size (µm)	1.46	0.73	0.49	0.36	0.24	0.18

Magnification sample	Pixel size in sample	Pixels per diffraction limited blur					
1	3.76	0.9	0.4	0.3	0.2	0.1	0.1
5	0.75	4.5	2.2	1.5	1.1	0.7	0.6
10	0.38	8.9	4.5	3.0	2.2	1.5	1.1
16	0.24	14.3	7.1	4.8	3.6	2.4	1.8
20	0.19	17.8	8.9	5.9	4.5	3.0	2.2

RETIGA E9 SENSOR TEMPERATURE



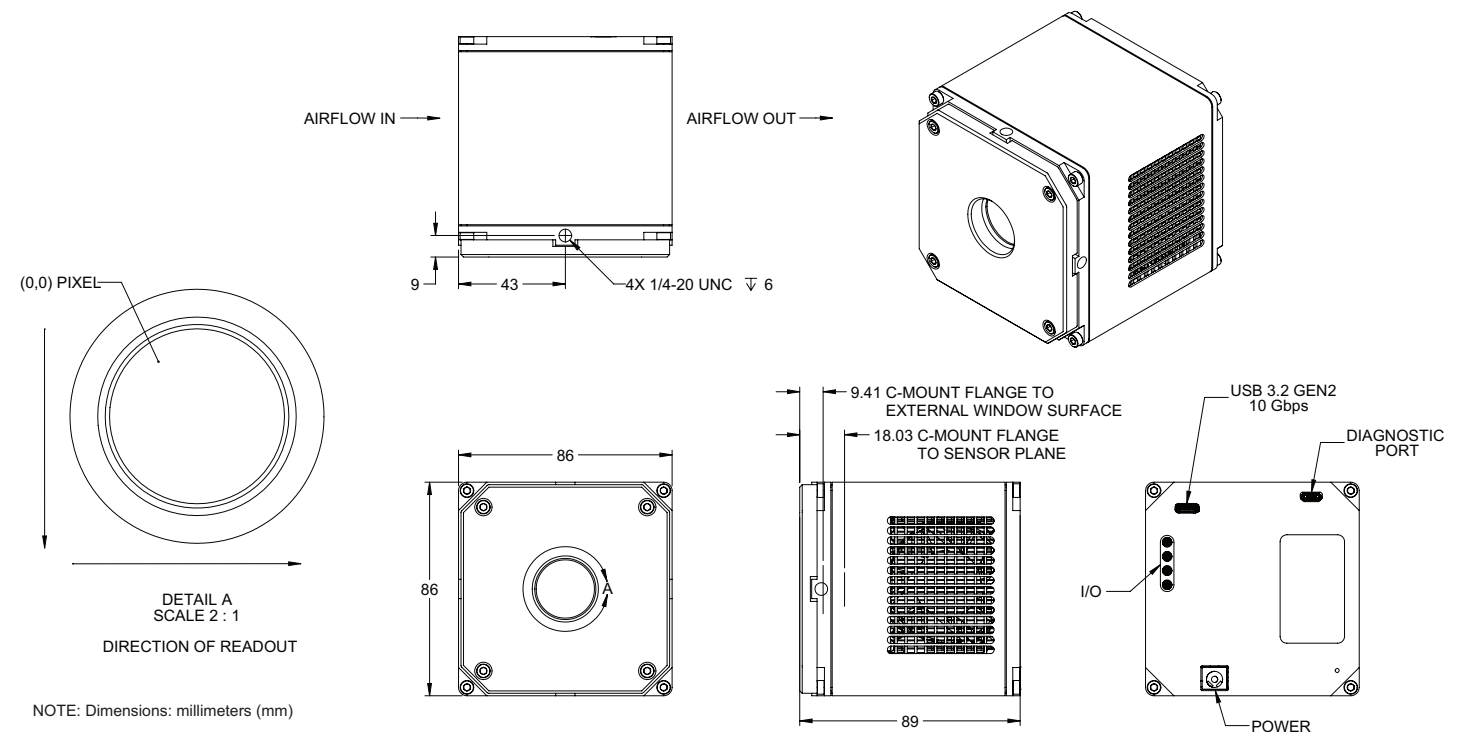
10⁻⁵ e⁻/p/s is on the order of an extra electron per pixel per day

Note on Dark Current Measurement

The Retiga E9 operates at a sensor temperature of -25 °C, where its dark current is exceptionally low—so low, in fact, that direct measurement requires hours-long dark exposures. To ensure efficient production testing, cameras are evaluated at 0 °C, where dark current can be measured in tens of minutes.

Using data collected across a range of sensor temperatures, (as seen in the sensor temperature plot) Teledyne accurately calculates the dark current at operating temperature, confirming the E9 camera’s industry-leading thermal noise performance.

RETIGA E9 DIMENSIONAL OUTLINES (UNIT: MM)



RETIGA E9 ACCESSORIES

ACCESSORIES (INCLUDED)		
USB 3.2 Gen 2 10 Gbps interface card	Power supply (12V/5A DC)	PVCAM installation USB
USB A-C data cable, 0.9 m	PVCAM drivers/software	
USB C-C 3M data cable, 3 m	Quick installation guide	
Mini-BNC trigger cable	Performance and gain test data	



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