COSMOS-8k LARGE AREA CMOS CAMERA

KEY FEATURES

- Large 8k x 8k pixel sensor
- > 90% QE
- 10 µm pixel size
- < 1 e^- read noise
- 18 fps at full resolution
- Sensor temperature < -25°C
- Dark current < 0.05 e^-/p/s
- 101 dB dynamic range
- Rolling and true global shutter
- Hardware, electronics, sensor and software developed by Teledyne

TYPICAL APPLICATIONS

- Ground-based astronomy
- Exoplanet characterization
- Orbital object tracking
- Near Earth Object characterization
- Time Domain Astronomy
- Solar Physics
- Adaptive optics
- Speckle/Lucky Imaging

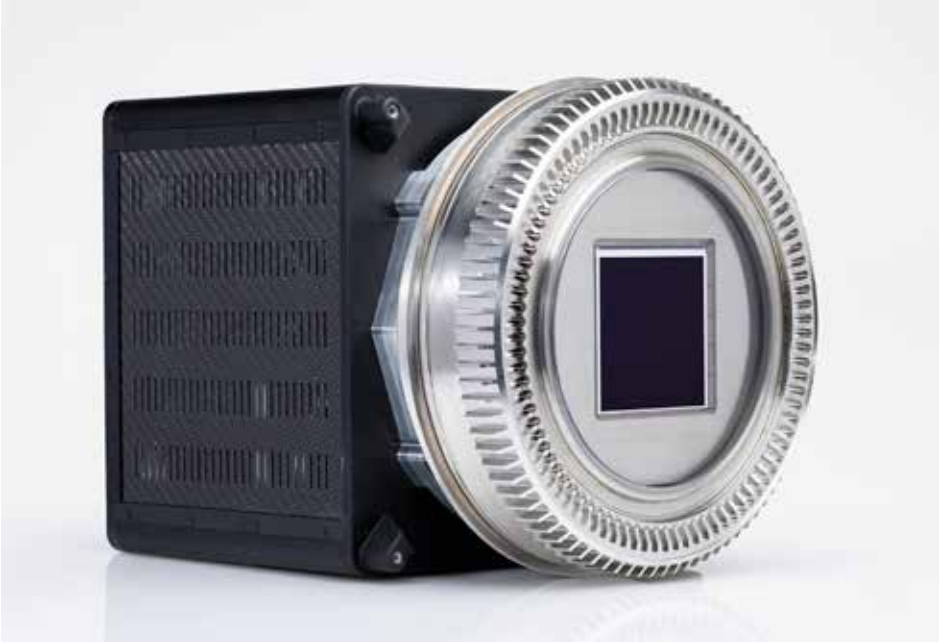
RELIABILITY

- High realiability, industry-leading Citadel chamber design

Next-Generation, Large Sensor, High-Performance Camera for Astronomy

Teledyne Princeton Instruments COSMOS camera merges CCD and CMOS performance, resulting in a new generation of camera distinct from anything else currently on the market. The COSMOS camera excels in several key areas: resolution, pixel size, sensitivity, and speed. Notably, it is the only large format, high performance CMOS camera designed and manufactured entirely within a single source, at Teledyne.

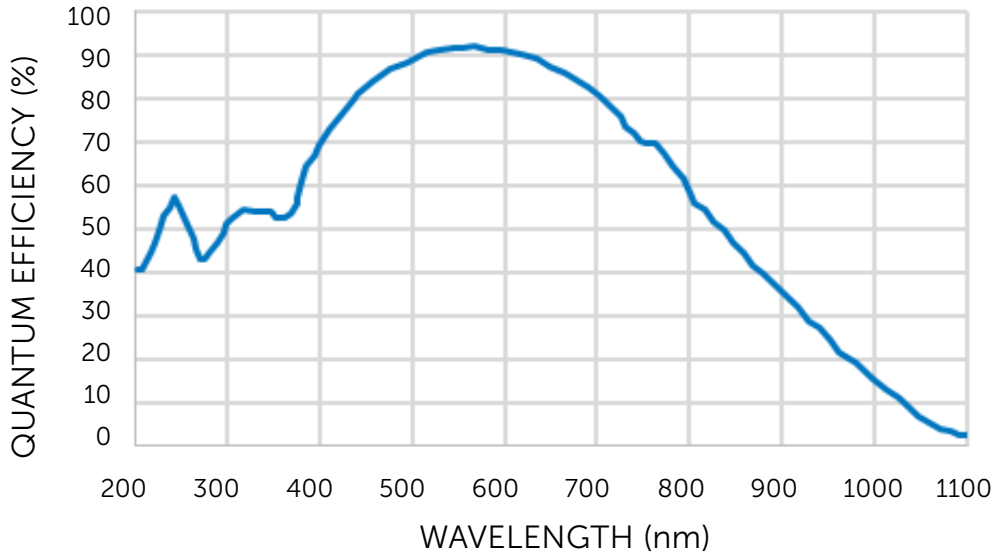
Teledyne Imaging has a history of providing solutions for world-changing projects, including the Mars Rover missions, ground-based observatories, and the James Webb Space Telescope. The COSMOS camera, leveraging its large area CMOS technology, stands as the ultimate solution for astronomy and more.



COSMOS-8k SPECIFICATIONS

SPECIFICATIONS	Camera Performance
Sensor	Back illuminated, grade 1, 100% fill factor
Active Array Size	8120 x 8120 (66 megapixels)
Pixel Area	10 x 10 µm (100 μm^2)
Sensor Area	81.2 x 81.2 mm (115 mm diagonal)
Peak QE%	> 90% peak QE
Spectral Response	200 – 1100 nm
Full Well Capacity	~ 14ke^- (typical, high gain), ~ 100ke^- (typical, low gain)
Read Noise	< 1.5 e^- RMS (typical, high gain mode), < 1e^- RMS (CMS mode)
Dark Current	< 0.05 e^-/p/s (typical)
Cooling Method	Thermoelectric with liquid circulation (requires external chiller)
Cooling Temperature	< -25 °C (guaranteed)
Data Interfaces	CoaXPress® (Teledyne PCIe frame grabber card included)
Bit depth	14-, 16-, and 18-bit
Readout Modes	Rolling and true global shutter
Max Exposure Time	> 1 hour
Window Material	JGS1 UV grade quartz glass; broadband AR coatings standard
Operating Temperature Range	-30°C to 30°C; relative humidity: ≤ 90% (non-condensing); altitude: 0-4500 meters
Camera Weight	21.4 kg
Camera Dimensions	26.2 x 26.2 x 32.8 cm (W x H x L)
Nonlinearity	< 1%
Binning	2 x 2 and 4 x 4 (on FPGA)
I/O signals	Three MCX connectors: 2x software configurable outputs, 1x trigger input
Certification	CE

COSMOS-8k QE CURVE



COSMOS-8k READOUT MODES AND PROPERTIES

HDR: High Dynamic Range Mode; CMS: Correlated Multisampling

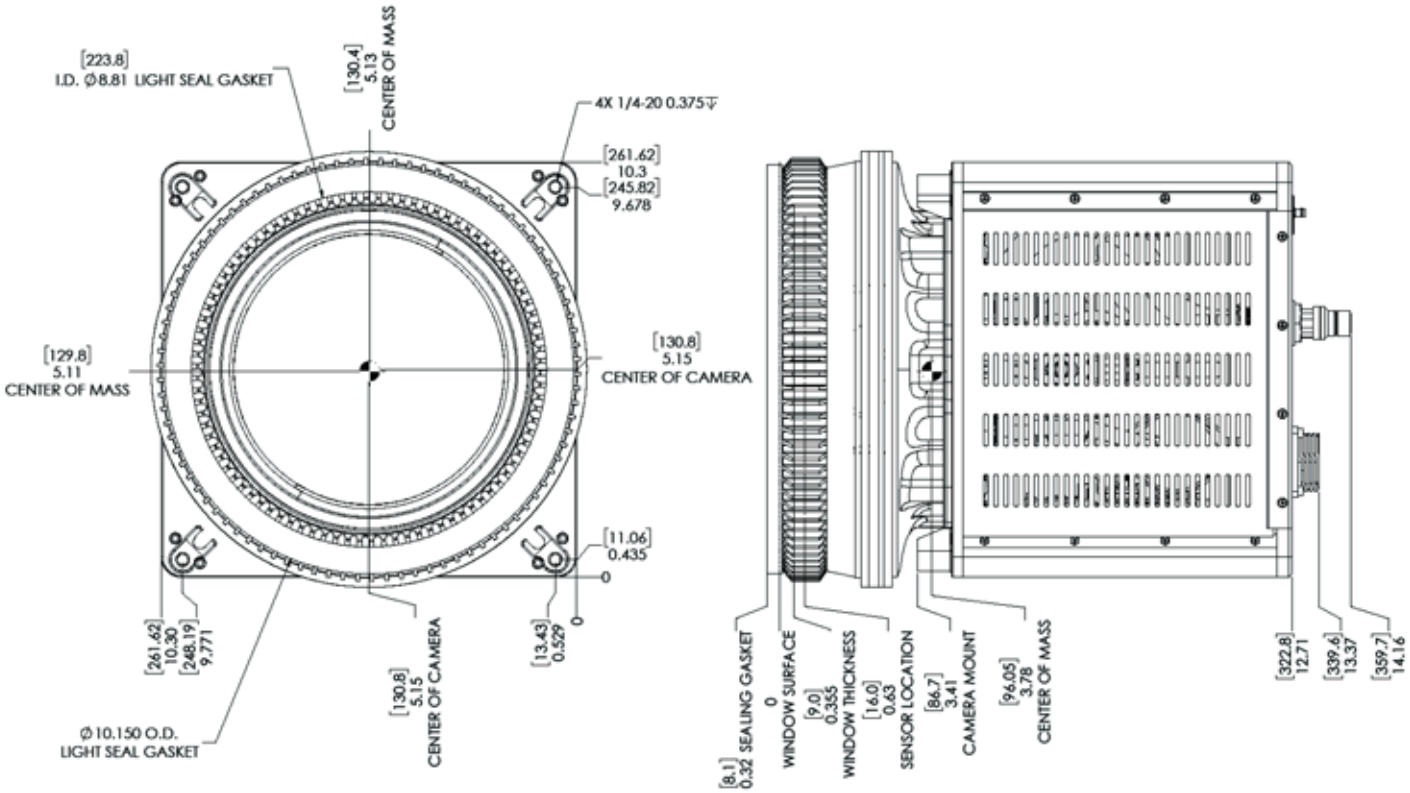
Data	Gain Setting	Shutter Mode	Read Noise (e^-)	Frame Rate (fps)
16 bit	High – CMS 8x	Rolling	< 1	0.8
14 bit	High	Rolling	1.4	18
14 bit	High	Global	2	18
16 bit	Low	Rolling	6	7.8
16 bit	Low	Global	11	6.1
18 bit	HDR	Rolling	1.2	2.9

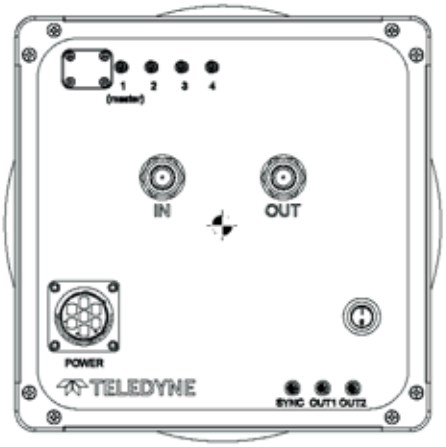
COSMOS-8k SPEED TABLE

Frame Rates (frames per second)

Region of interest size (pixels)	14-bit (rolling shutter and global shutter	16-bit (rolling shutter – CMS)	16-bit (rolling shutter)	14-bit (global shutter)	16-bit (global shutter)	18 bit (HDR)
8120 x 8120	18	0.8	7.8	18	6.1	2.9
8120 x 4096	36	1.6	15	36	12	5.7
8120 x 2048	73	3.2	30	72	24	11
8120 x 1600	92	4.1	39	92	31	14
8120 x 1024	144	6.4	61	144	48	22
8120 x 512	288	12	120	288	96	45
8120 x 256	572	24	233	572	189	88

DIMENSIONAL OUTLINES (Unit: mm)





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Specifications in this datasheet are subject to change. Refer to the Teledyne Space Imaging website for most current specifications.

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