

INDUSTRIAL CAMERAS



GigE, 5/10 GigE, USB3, Camera Link CMOS/SWIR/LWIR line & area cameras, digital frame grabbers, Spera Software



USB2, USB3, GigE, 10GigE CMOS/CCD, smart, stereo, area scan cameras some with IP65/67



GigE, 5GigE, USB3, MIPI CSI-2, CMOS, Canon lens support, and SWIR area scan cameras with embedded support



GigE, 5GigE, USB3, CXP, CL CMOS/CCD line & area cameras and 3-4 chip multi-spectral cameras



Event Based Sensors based on neuromorphic engineering principles



Time of Flight (ToF) 3D cameras for 3D depth measurement & sensing with sub-mm precision



High and Ultra High-resolution area scan cameras with GigE, 10GigE, USB3, CL and CXP Interfaces



3D sensor and "Smart" Infra-red cameras. Best in class for resolution and speed

LENSES & OPTICS



C/CS-mount Factory Automation lenses, fixed/varifocal/zoom



C/F/M42 to M95-mount Factory Automation lenses, fixed & varifocal, telecentric and Line Scan lenses



C-mount Factory Automation lenses, fixed focus up to 4/3" and 100mm focal lengths



Complete imaging modules for precision microscopy, machine vision, & metrology applications



C/CS/F-mount Factory Automation lenses, fixed/varifocal/zoom, VIS/SWIR



C/CS/S-mount Factory Automation lenses, fixed/varifocal/zoom, telecentric



C/F/T/M72-mount high-precision lenses, fixed/varifocal/zoom, VIS to SWIR



C/F/V/M42 to M95-mount modular high-precision lenses, area/line scan



C/CS-mount Factory Automation lenses, fixed/varifocal/zoom



C/F/M42 to M95-mount telecentric lenses, 360°, macro, area/line scan



Machine vision filters, polarizers & optical solutions for a wide variety of imaging applications



C-mount electronically focused tunable liquid lenses, VIS/NIR/1064nm,

LIGHTING



LED lighting & controllers, ultra-high uniformity back/front, bar, line, tunnel, on-axis lighting



LED lighting & controllers, high-power area & line illuminators/projectors



LED lighting & controllers, high-power area & line illuminators/projectors



LED Lighting, Powerful, flexible, easy to use lighting for machine vision applications

ACCESSORIES



FPGA modules, Frame grabbers, Real Time Image compression, Mini Jetson PC



DVR software supporting GigE/USB/CL/CXP cameras, GPS/DAQ/DVI/Batch/Audio/JPEG mods



USB3, GigE, CXP, Camera link, and I/O industrial cables, Power Supplies, and Enclosures

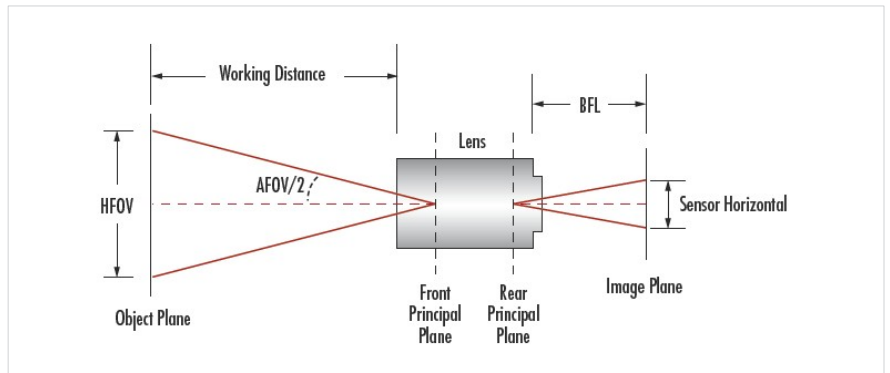
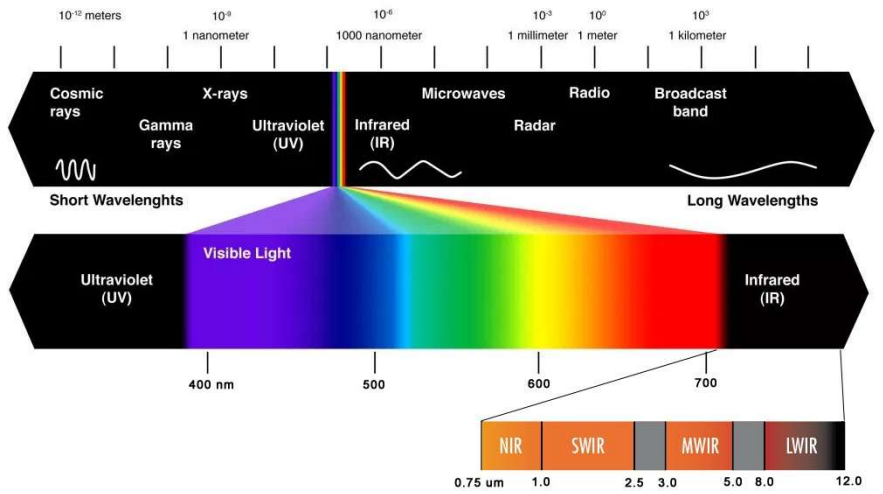


LED lighting and focus tunable optics controllers, 1 to 16 channels, high current pulsing

**Imager Format vs. Image Circle**

Format	Image Circle	H x V
1/4"	4.5 mm	3.6 x 2.7 mm
1/3.6"	5 mm	4.0 x 3.0 mm
1/3"	6 mm	4.8 x 3.6 mm
1/2.7"	6.7 mm	5.4 x 4.0 mm
1/2.5"	7.2 mm	5.8 x 4.3 mm
1/2.3"	7.9 mm	6.3 x 4.7 mm
1/2"	8 mm	6.4 x 4.8 mm
1/1.8"	8.9 mm	6.4 x 4.8 mm
2/3"	11 mm	8.8 x 6.6 mm
1/1.2"	13.4 mm	11.3 x 7.1 mm
1"	16 mm	12.8 x 9.6 mm
1.1"	17.5 mm	14.1 x 10.3 mm
4/3"	21.6 mm	17.9 x 15.6 mm
APS-C/DX	28.3 mm	23.7 x 15.6 mm
APS-H	33.5 mm	27.9 x 18.6 mm
35mm/FX	43.3 mm	35.9 x 24.0 mm

**Electromagnetic Spectrum**



<b>Magnification</b>	Sensor Horizontal/HFOV
<b>Focal Length</b>	Working Distance/(1+1/Magnification)
<b>Magnification</b>	Focal Length/Working Distance

**Pixel size vs. LP/mm**

Pixel Size	Nyquist Limit
1.67 um	299 lp/mm
2.2 um	227 lp/mm
3.45 um	145 lp/mm
4.54 um	110 lp/mm
5.5 um	91 lp/mm

**Sony Pregius Image Sensors - Average Performance by Generation**

	1st Generation	2nd Generation	3rd Generation	4th Generation
Pixel Size (um)	5.86	3.45	4.5	2.74
Average Quantum Efficiency (%)	68	66	77	74
Average Dark Noise (e-/sec)	6.8	2.2	5.4	2.1
Average Saturation Capacity (ke-)	32.5	10.7	25	9.4
Average Dynamic range (dB)	70	71	71	71
Average SNR (dB)	45	40	44	40

For additional imaging tips, guidelines, and calculators check out our online knowledgebase at:

[1stvision.com/knowledgebase](http://1stvision.com/knowledgebase)