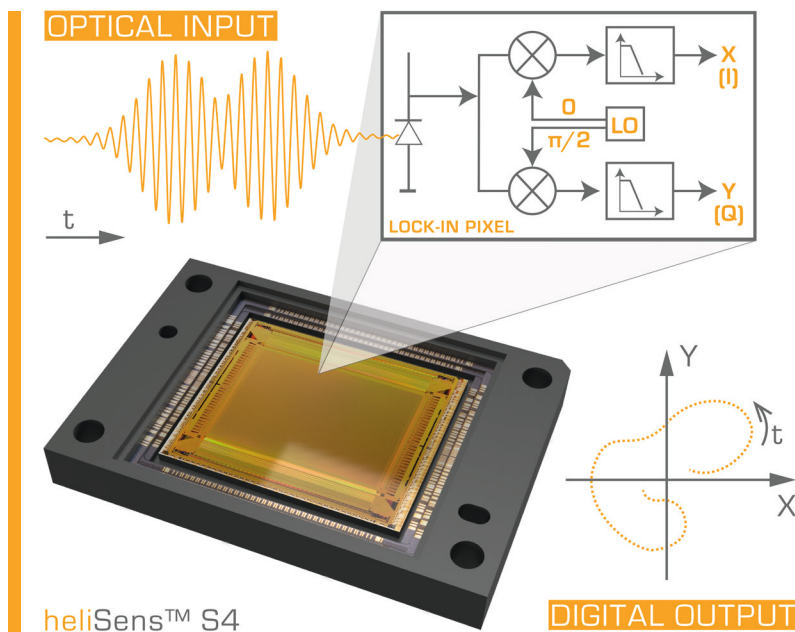


Imagine what you could do with

# TIME-RESOLVED PIXEL-PARALLEL LOCK-IN DETECTION

Transform your lock-in measurements using our unique sensor technology with 1 128 448 parallel dual-phase demodulators.

Applications include pump-probe microscopy, quantum diamond magnetometry, quantum sensing, Raman spectroscopy, holography, phase contrast imaging, interferometry and more.



Features \ Model	C4M.0-S4M0																				
heliSens™ S4M High Speed Lock-in Pixel Image Sensor	1024 x 1102 pixel with in-pixel lock-in amplifiers																				
	pixel pitch: 12 μm x 12 μm																				
	Full Well Capacity (FWC): 70 ke <sup>-</sup>																				
	fill factor: 23%																				
	detection threshold $P_{\min}$ [mW/m <sup>2</sup> ]																				
	<table border="1"> <tr> <td>fd=1kHz, tc=10ms</td> <td>1.2</td> </tr> <tr> <td>fd=10kHz, tc=1ms</td> <td>12</td> </tr> <tr> <td>fd=50kHz, tc=1ms</td> <td>26</td> </tr> </table>	fd=1kHz, tc=10ms	1.2	fd=10kHz, tc=1ms	12	fd=50kHz, tc=1ms	26														
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fd=10kHz, tc=1ms	12																				
fd=50kHz, tc=1ms	26																				
Lock-in Features	quantum efficiency (QE)																				
	<table border="1"> <tr> <td>nm</td> <td>400</td> <td>450</td> <td>500</td> <td>550</td> <td>600</td> <td>650</td> <td>700</td> <td>750</td> <td>800</td> </tr> <tr> <td>%</td> <td>61.7</td> <td>73.1</td> <td>78.7</td> <td>78.6</td> <td>74.9</td> <td>72.9</td> <td>69.4</td> <td>58.4</td> <td>45.5</td> </tr> </table>	nm	400	450	500	550	600	650	700	750	800	%	61.7	73.1	78.7	78.6	74.9	72.9	69.4	58.4	45.5
	nm	400	450	500	550	600	650	700	750	800											
	%	61.7	73.1	78.7	78.6	74.9	72.9	69.4	58.4	45.5											
	number of parallel demodulators: 1 128 448 dual-phase																				
	demodulation frequency fd: 305 Hz - 50 kHz																				
	filter time constant tc: 0.8 ms - 100 ms																				
	frequency resolution: < 0.0025 x demodulation frequency																				
	phase resolution: 0.1 deg																				
	dynamic range for signal: 2 x 10 bit (X, Y)																				
background (common mode) suppression: 18 bit equivalent																					
min detectable contrast: 2.5E-4 time-resolved, 2.5E-5 with averaging																					
heliSDK™ 4 Programming Interface	output data: magnitude & phase, in-phase X & quadrature Y, grey scale																				
	max signal sample rate: 200 kSa/s per channel, 226 GSa/s in total																				
heliViewer™ 4 Application Software	max output sample rate: 1.4 kSa/s per channel, 1.55 GSa/s in total																				
	memory depth: 225 time-resolved output frames, 254 MSa in total																				
Electrical Interfaces	GEN<i>CAM producer DLL for client systems																				
	examples for Python, Matlab®, LabVIEW®, C++, .NET																				
	GUI based application for camera control, data acquisition, visualization and storage																				
Power Supply	Gigabit Ethernet																				
	reference input, internal reference output, configurable output, acquisition trigger with programmable phase delay																				
Mounting	test LED driver (DC, sine wave continuous/burst up to 50 kHz)																				
	24 V DC, 30 W																				
Accessories	C-mount for standard objectives (detachable)																				
	M6-mounting holes at front, left, right, top																				
	heliDriver™ D3 with lock-in module																				
	active cooling module (silent fan-unit with off-switch)																				
Dimensions [mm]	test LED module (starter kit)																				
	set of cables																				
Weight [g]	46 x 65 x 180 (without C-mount adapter)																				
Operating Temperature [°C]	850																				
	0 to 45 (mounted on heat sink or with active cooling module)																				

