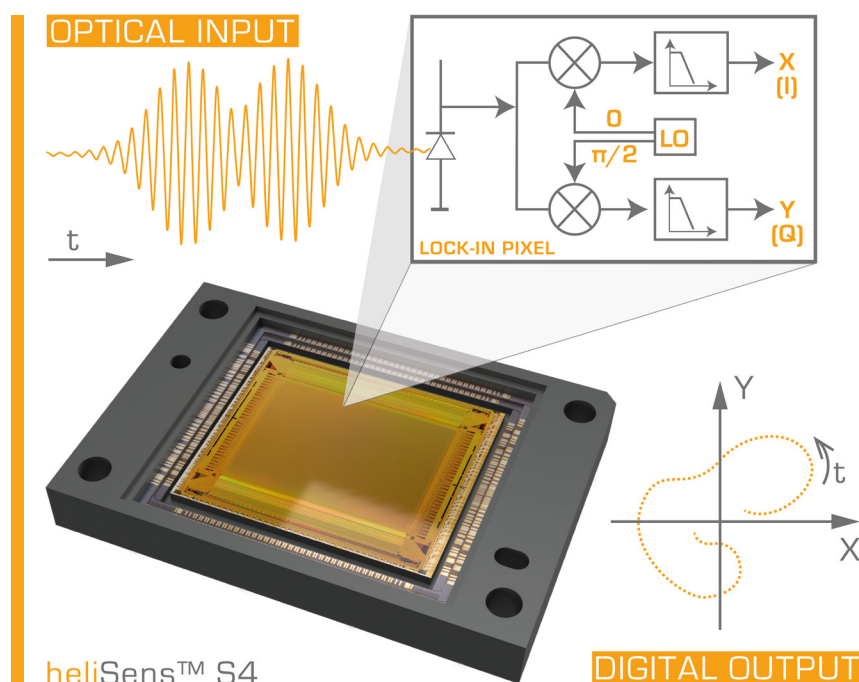


TIME-RESOLVED PIXEL-PARALLEL
LOCK-IN DETECTION

Upscale your lock-in experiment with 277 504
parallel dual-phase demodulators

Pump-probe, spectroscopy, phase contrast,
doppler shift, holography, interferometry, etc.



Each pixel demodulates optical signals of up to 250 kHz



Features \ Model	C4.0-S40-Rx	C4.0-S40U-Rx	C4.0-S41U-Rx
heliSens™ S4 High Speed Lock-In Pixel Image Sensor	542 x 512 pixel with in-pixel lock-in amplifiers		
	pixel pitch: 24 µm x 24 µm		
	Full Well Capacity (FWC): 500 ke ⁻		FWC: 125 ke ⁻
	fill factor: 21%	fill factor: 55% w. µ-lens	fill factor: 55% w. µ-lens
	detection threshold P _{min} [mW/m²]		
	fd=1kHz, tc=10ms	1.03	0.34
	fd=10kHz, tc=1ms	10.3	3.4
	fd=100kHz, tc=1ms	33.3	10.9
Lock-In Features	quantum efficiency (QE)		
	nm	400	450
	%	61.7	73.1
		500	550
		600	650
		700	750
		800	850
		900	950
		1000	1050
		1100	1150
		1200	1250
		1300	1350
		1400	1450
		1500	1550
heliSDK™ 4 Programming Interface	number of parallel demodulators: 277 504 dual-phase		
	demodulation frequency fd: 1 kHz - 250 kHz		
	filter time constant tc: 0.2 ms - 100 ms		
heliViewer™ 4 Application Software	frequency resolution: < 0.001 x demodulation frequency		
	phase resolution: 0.1 deg		
	dynamic range for signal: 2 x 10 bit [X, Y]		
Electrical Interfaces	background [common mode] suppression: 21 bit equivalent		
	min detectable contrast: 1E-4 time-resolved, 1E-5 with averaging		
	output data: magnitude & phase, in-phase X & quadrature Y, grey scale		
Power Supply	max signal sample rate: 1 MSa/s per channel, 277 GSa/s in total		
	max output sample rate: 5.6 kSa/s per channel, 3.12 GSa/s in total		
	memory depth: 1000 time-resolved output frames, 277 MSa in total		
Mounting	GEN<i>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		
Accessories	Gigabit Ethernet		
	reference input, internal reference output, configurable output, acquisition trigger with programmable phase delay		
	test signal (DC, sine wave continuous/burst up to 50 kHz)		
Cooling Options	24 V DC, 30 W		
	C-mount for standard objectives [detachable]		
	M6-mounting holes at front, left, right, top		
Dimensions [mm]	heliDriver™ D3 with lock-in module		
	LED module starter kit		
	set of cables		
Weight [g]	C4.0-S4x-R0		
	C4.0-S4x-R1		
	C4.0-S4x-R2		
Operating Temperature [°C]	46 x 65 x 180		
	100 x 65 x 180		
	500		
	650		
	0 to 45 mounted on heat sink		
	0 to 45 integrated passive cooler		

