

# SPIDER Amplified Photodetector & ADC

SPIDER is an **amplified Si-InGaAs photodetector** with **programmable gain** and an **embedded 24bit data acquisition system**. The employed two-color detector provides a straightforward beam alignment and a **wide spectral response**, ranging from **320nm to 1700nm**.

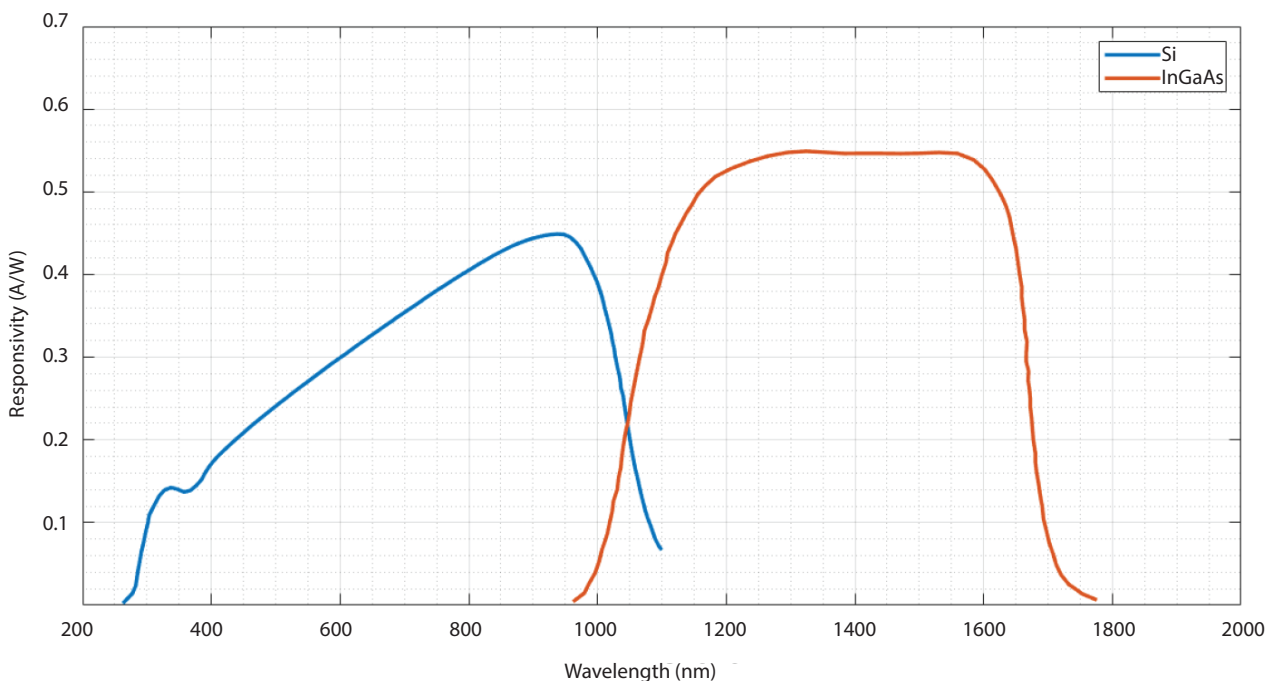
The Si and InGaAs photodiodes are amplified simultaneously with two independent low-noise amplifiers, with 8 programmable gains.

## Key Features

- Amplified Detector & Analog-to-Digital Converter in a Unique Device
- Broad spectral coverage with a single-pixel element
- High Sensitivity (pico-Watt range)
- High Dynamic Range ( $10^9:1$ )
- Plug&Play software and DLLs available

## Other Features

- Fiber coupling available
- 8 programmable gains
- 2 channels, 24 bit ADC, up to 120 kSPS/channel
- 2 BNCs for analog outputs
- 3 GPIOs (for an easy sync. with external devices)
- USB connection to PC



## Technical specifications

### Optical Specs

Detector element (Photosensitive area)	Spectral response range [ $\mu\text{m}$ ]	Peak sensitivity wavelength $\lambda_p$ [ $\mu\text{m}$ ]	Responsivity R $\lambda = \lambda_p$ [A/W]	Dark Current $I_D$	Detectivity $D^*$ $\lambda = \lambda_p$ [ $\text{cm}^2 \cdot \text{Hz}^{1/2} / \text{W}$ ]
Si (2.4 x 2.4mm)	0.32 to 1.08	0.94	0.45	130pA	$1.4 \times 10^{13}$
InGaAs ( $\varnothing$ 1mm)	1.01 to 1.7	1.55	0.55	1nA	$3.5 \times 10^{12}$

### Transimpedance Amplifier Specs

# of Programmable Gain	8							
	Selected Gain							
	#1	#2	#3	#4	#5	#6	#7	#8
Gain [dB <sub>0</sub> ]	64	73	83	93	103	113	123	133
Bandwidth (-3dB) [kHz]	56	55	54	53	52	49	39	29
Output Noise* [nV/ $\sqrt{\text{Hz}}$ ]	20	22	26	36	61	121	265	680

\* measured at 20 kHz

### Analog to Digital Converter Specs

# of Predefined Sampling Rates	11 (120, 100, 80, 64, 32, 16, 10, 5, 2.5, 1, 0.5 kSPS)				
Sampling Rate [kSPS]	BW [kHz]	SNR [dB]	RMS Noise* [V]	BITS	ENOB
120 (max.)	52	113	1.4 E-5	24	19.2
0.5 (min.)	0.217	136.8	1.8 E-6	24	22.2

\* selected gain #=1.

for the details at all the sampling rates, please contact us.

### Other Specs

	Min	Typ	Max
Power Consumption [W]	3.5		
Power supply voltage [V]	10	12	14
Output series resistance [k $\Omega$ ]	1.5 (on the BNC)		
Output analog voltage [V]	0 - 10 (on the BNC)		
Weight [g]	218		
Package size [mm]	101.5 x 81 x 28.5		
Operating Temp. [ $^{\circ}\text{C}$ ]	10	--	40
Storage Temp. [ $^{\circ}\text{C}$ ]	-20	--	70