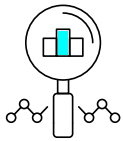


Singular<sup>™</sup>  
Photonics

## Company overview

Singular Photonics, a company with deep roots from the world leading University of Edinburgh CMOS Sensors and Systems group, are bringing to market the next generation of sensors based on single photon avalanche diodes (SPADs). These sensors can detect and time single photons (light quanta) enabling simultaneous capture of depth and temporal dimensions generating 4D images.

## Why choose us



### Deep industry experience

Our founding team have over 60 years combined industry and academic expertise in the design of SPAD sensors.



### Innovation

We are committed to providing innovative solutions that will help create a better tomorrow for everyone.



### Integration

Our solutions are designed to seamlessly integrate into your solution.

## Overview

### Sirona Sensor

- Line sensor

### Why SPAD arrays?

- CMOS integration
- Low DCR
- Time Resolved Capabilities
- Single Photon Sensitive
- Room Temperature Operation

### Applications

- Raman Spectroscopy
- FLIM
- Time of Flight
- Quantum

### Modes

- Single Photon Counting
- TCSPC

### Software & Firmware

- Universal API
- Integration with LabView, Matlab, Python and other languages

# Sirona

## Technical Specifications



### Sirona Sensor

<b>Detector Type</b>	CMOS SPAD
<b>Sensor Dimension</b>	12.648 mm x 1.99 mm
<b>Photon Detection Probability (PDP)</b>	40% @ 480 nm (Blue SPADs) 40% @ 620 nm (Red SPADs)
<b>Fill Factor</b>	49.31% (Blue), 28.20% (Red)
<b>Dark Count Rate</b>	400 cps (Blue SPAD)    Excess bias = 50 cps (Red SPAD)        1.5V @ 25 Degree C
<b>Dead Time</b>	10 ns
<b>Pixel Array</b>	1024 x 8 (Red), 1024 x 8 (Blue)
<b>Pixel Pitch</b>	23.78 $\mu$ m



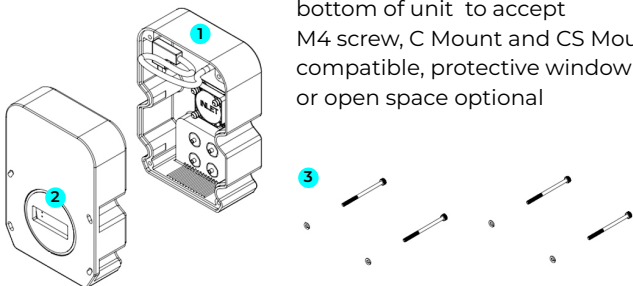
### Timing

<b>On-chip TDC</b>	1 per pixel
<b>Timing Jitter</b>	164 ps (Blue SPADs) 139 ps (Red SPADs)
<b>Time-resolved Detection</b>	Yes
<b>Time Resolution</b>	51.2 ps (minimum) 6.55 ns (maximum)
<b>Time Gating</b>	Yes
<b>Timing / Spectral Channels</b>	512
<b>TDC Range</b>	3,355 ns (TCSPC mode) 209 ns (Histogram mode)
<b>On-chip Delay Generator</b>	Yes
<b>Delay Range</b>	0 to 516 ns (programmable in steps of 63 ps)

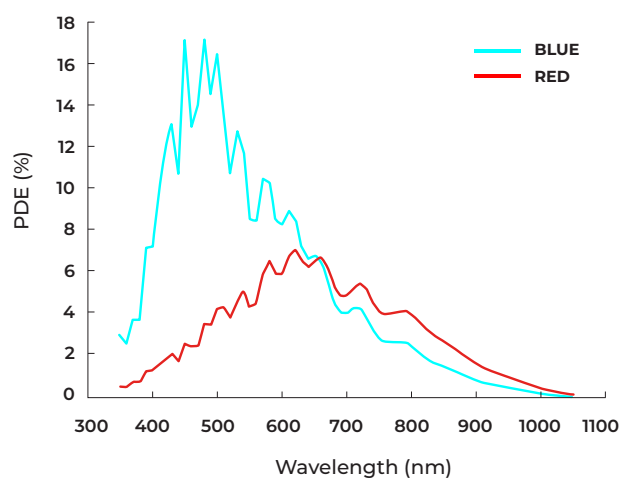


### Dimensions and Mounting

- 1. Camera Unit:** 102 mm x 145 mm x 85.25 mm
- 2. Optical Window:** 20 mm diameter
- 3. Mounting Type:** 4x through holes to accept M4 screws and 1x threaded hole on bottom of unit to accept M4 screw, C Mount and CS Mount compatible, protective window or open space optional



### Photon Detection Efficiency



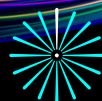
### Data Handling

- Data Compression:** Yes (Histograms)
- Data Rate:** 2.5 Gbps (At 40 MHz IO rate)
- Line Rate:** 454 (11 bit / pixel SPC and TCSPC) Kline/s



### Interfaces

- Power:** 12 V  
AC / DC brick provided
- Data Connection:** USB-C
- Synchronisation:** 4 x TTL / NIM compatible  
Factory configured



Singular™  
Photonics

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We recognise the importance of our **PEOPLE**

We strive for **EXCELLENCE**

We operate with **INTEGRITY**

We deliver **RESULTS**