PF32 Time-correlated single-photon counting SPAD camera

PF32-Ultra-STA

available with microlenses (MLA)

The PF32 comprises a single-photon sensitive imaging sensor with best-in-class timing resolution and a market-leading throughput of up to half a billion photons time-stamped per second.

The PF32 is powered by a 5V supply and connects via USB-C to a host PC via our multi-platform driver for easy integration with your analysis software.

Features

- 1024 pixel SPAD array (32×32 pixel layout)
- Time-resolved and photon counting modes
- In-pixel TDC with 55ps timing resolution and ≈200ps FWHM instrument response function (IRF)
- Low median dark count rate
- Up to 700kfps transfer to PC (bit-depth dependent)
- Sync input from light source (user programmable)
- Sync output to e.g. light source (user programmable frequency)
- Inputs accepted from scanning systems to form higher resolution images

Applications

- Fluorescence Lifetime Imaging Microscopy (FLIM)
- LiDAR and 3D imaging (inc. Non-line of sight and imaging through obscurants)
- Quantum imaging
- Diffuse Correlation Spectroscopy (DCS)

Specifications

Sensor Dimensions

Array size	32 x 32 pixels
Array dimensions	1.6 x 1.6mm
SPAD active area (diameter)	6.95µm
Pixel pitch	50µm
Optical fill factor	1.5%
Effective fill factor with microlens array	Up to 20%

Optical/Electrical Performance

Photon detection probability	See graph below, right
Dark count rate	<100cps for more than 80% of pixels
Afterpulsing	<0.02%
Optical/Electrical crosstalk	None
Instrument Response Function (IRF)	≈200ps FWHM

Photon Counting Mode

Photon counting	7 bit in-pixel 16 bit in firmware
Max. count rate per pixel	20Mcps

Time Correlated Mode

Temporal bin	55ps
Temporal range	55ps - 57ns
TDC resolution	10 bit
Maximum laser sync frequency	100MHz
Laser sync input amplitude	User programmable
Laser sync input polarity	User programmable
Laser sync output amplitude	3.3V

Readout & Control

Raw data streaming rate to PC	150kfps (16-bit) 300kfps (8-bit) 600kfps (4-bit) 714kfps (2-bit)
Inter-frame dead time	<50ns
X/Y scanner sync input signals	Pixel, line and frame clock
Exposure sync signals	Blanking (3.3V / 5V input) Shutter (3.3V output)

Operating Conditions

Temperature range	10-30°C
Humidity	≤ 70%
Indoor/Outdoor	Indoor only
Power supply	5V, 1.5A
AC/DC adapter voltage input	100-240V AC, 50/60Hz
Power consumption	2.5W typical, 7.5W max.

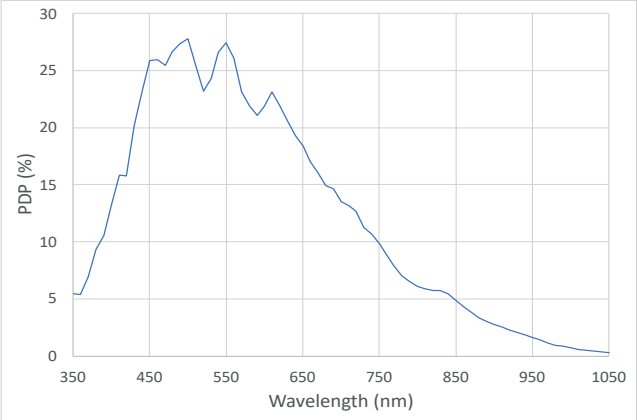
Miscellaneous

Housing material	T6061 CNC machined aluminium, hard anodised
Lens mount	CS-Mount (adapters available)
Colour	Black
Supplied with	Aluminium flight case, USB C cable, 5V power supply
Weight	900g
Packed weight	4kg

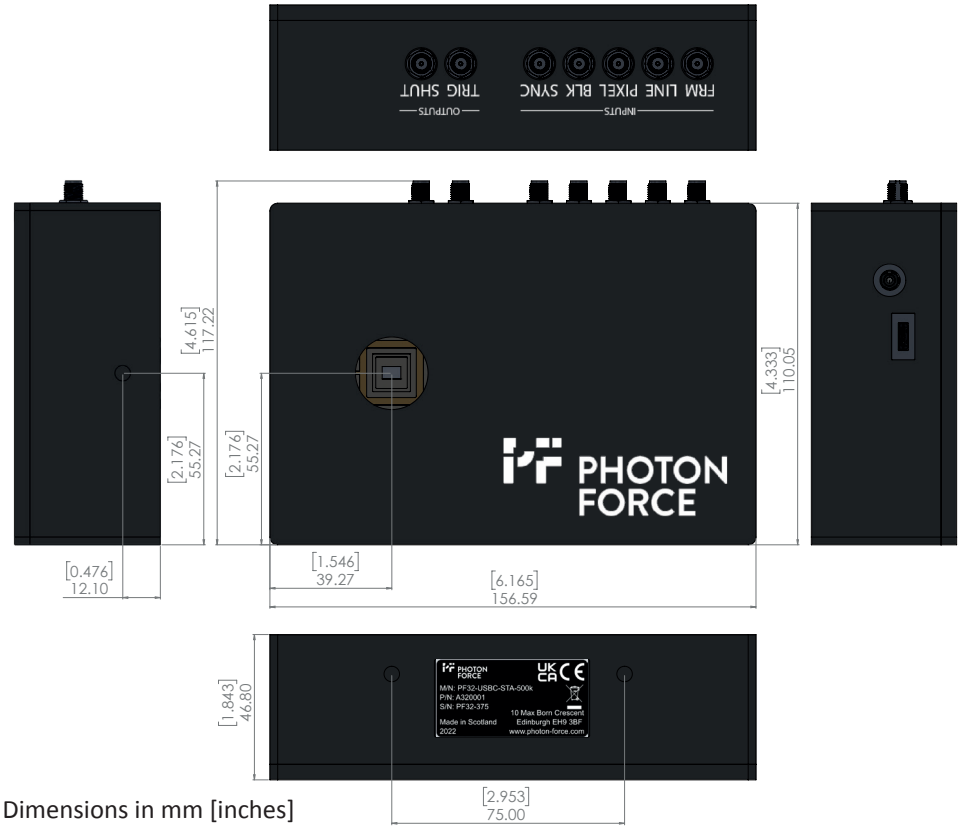
Software

Basic Java app for getting started, Matlab and Python wrappers for high speed data collection, Driver compatible with C++, LabVIEW and other languages for integration with customers' workflow

Photon Detection Probabilty vs. Wavelength



PF32 Camera Dimensions



Dimensions in mm [inches]

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