

HRPCS

High Resolution Photon Counting System



The HRPCS5, now in its 5th generation, is a true single photon counting camera providing the ability to capture and integrate ultra-low-light images in real time.

The HRPCS5 is a parallel readout device capable of detecting multiple photons at the exactly the same time. Its readout rate of 50 frames per second at full resolution, low dark count rate 1.3 Mpix sensor provides high sensitivity over a wide dynamic range.

Bespoke versions of the HRPCS5 can be delivered with any of the wide range of Photek's image intensifiers. Full systems can be provided with sensor cooling for ultra low noise, computer controlled sample stage, sample temperature control and light-tight enclosures.

Operation has never been easier thanks to the plug-n-play USB 3.0 interface and intuitive Image32 software that includes functions specifically designed for photon counting applications.

Key Attributes

- > 50 full frames per second
- > 1.3 megapixel readout
- > Variety of high QE, low noise photocathodes covering the full UV-VIS band
- > Bright field mode for focusing
- > Integrated optical gating
- > Fibre optic input for proximity focus
- > USB 3.0 interface
- > Easy to use software with functions specifically designed for photon counting
- > Custom options available

Applications

- > Bioluminescence Imaging of Luciferase and Aequorin
- > Chemiluminescence Imaging
- > ATP-Bioluminescence Studies
- > Simultaneous fluorescence and luminescence imaging
- > Analysis of microtiter plates
- > Autoradiography
- > X-ray and particle photon counting
- > Low light fluorescence

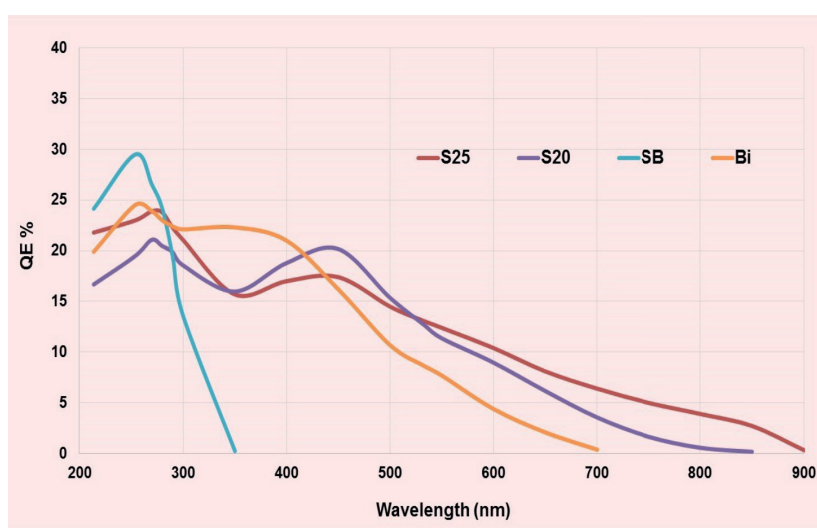
Specifications





Camera	Standard	High Speed Option
Sensor	e2v EV76C560ABT	Sony IMX174
Image Format	1280 x 1024 pixels	1936 x 1216 pixels
Pixel Size	5.3 microns	5.86 microns
Frame Rate (full frame)	60 fps	166 fps
ADC	10 bits	12 bits
Interface	USB 3.0	USB 3.0
Gating	Standard	High Speed Option
Min Gate Width	50 ns	3 ns
Max Repetition Rate	10 kHz	300 kHz
Gating Control	Standard	High Speed Option
Gate Controller	HRPCS	GIC3
Delay/Width Increment	5 ns steps	1 ns steps
Internal Time Base in Asynchronous Mode	Up to 10 KHz	Up to 300 KHz
Trigger Mode	External / Camera / Time base	External / Camera / Time base
Camera Trigger	Synchronous (1 gate trigger per camera frame) / Asynchronous (multiplegate triggers per camera frame)	
Intensifier	Standard	High Speed Option
Intensifier	MCP218 or MCP225	MCP218 or MCP225
Input Window Material	Fused Silica or Fibre Optic	Fused Silica or Fibre Optic
Photocathode	SB, Bialkali, S20, S25	SB, Bialkali, S20, S25
Resolution	25 lp/mm	25 lp/mm
Gain	Fully adjustable	Fully adjustable
Uniformity	10% SD/mean	10% SD/mean
Phosphor (Decay time)	P43 (1 ms to 10%) or P46 (300 ns to 10%)	P43 (1 ms to 10%) or P46 (300 ns to 10%)
Coupling Method	Fiber Optic Taper	Relay Lens
Effective Pixel Size (18 mm)	8.7 microns	9.3 microns
Effective Pixel Size (25 mm)	12 microns	13 microns

Features and Benefits

Features	Benefits
Single photon counting	Noiseless readout enhances sensitivity at very low light levels and enables long integration times
Photon location determined by integral center-of-gravity calculation	Ensures high spatial resolution in photon counting mode
Optical gating to < 3 ns	Accurately capture fast transient events while reducing unwanted background
Fibre optic coupling	Optimum coupling of the Image Intensifier to the sensor, boosting gain and reducing vignetting
Bright field mode	Simplifies camera focus
USB interface	Plug-n-play operation
Image32 software	Easy to use software specifically designed for photon counting, intensified cameras
Fully integrated gating control and power supply	No troublesome high voltage cabling
High QE image intensifiers	Best-in-class QE throughout the UV ensuring best overall signal-to-noise
Highly customizable	Options include alternative sensors, 25/40 mm image intensifiers, customized software, wide range of accessories

Quantum Efficiency Curves



Dark Count Rate at 20%		
	SB	<5
	Bi	<50
	S20	<2000
	S25	<20,000

Note: The spectral graphs shown opposite are for indication only. Detectors with Fibre Optic input windows will have lower sensitivity and no response below 300nm. If high UV response and fast gating is required, a mesh substrate is recommended. The high speed option will have lower sensitivity. Please contact the Sales office to discuss your exact requirements.

Software

To harness the power of the HRPCS, Photek provides its unique and easy to use imaging software. The **Image32** image processing software provides a wide range of tools for manipulating images and analyzing data.

A simple to use dialog box for controlling the camera is provided for camera setup including: region of interest, sub sampling, exposure time, gain and recording options. Event list data including x, y photon location and time can be saved to a file for later analysis.

Included with the iCMOS 160 Camera:

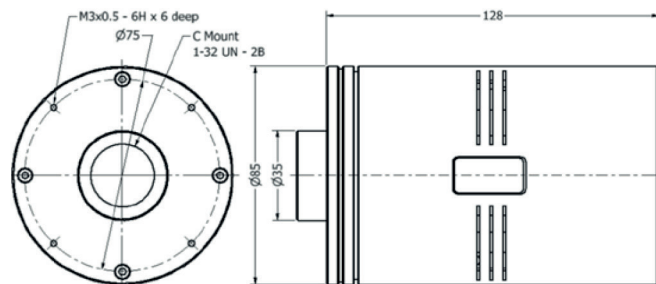
AC Power Brick and mains cable, USB 3.0 Camera Cable, USB 2.0 Control Cable, Image32 Software, User Manual.



Computer Requirements		Operating Conditions	
Processor:	i5 CPU, 2 GHz minimum	Operating Temperature:	10°C to 40°C
RAM:	4 GB minimum	Relative Humidity:	<70% (non-condensing)
Operating System:	Windows 7,8,10	Storage Temperature:	0°C to 55°C
USB:	USB 3.0 port available	Power Requirements	
Min Monitor Resolution:	1024 x 768	12 V Power brick supplied, 100-240 VAC, 50-60 Hz	

Mechanical

STANDARD OPTION



HIGH SPEED OPTION

