LOW LIGHT LEVEL IMAGING
25 mm IMAGE INTENSIFIER
F-MOUNT

PHOTONIS
EXOSENS GROUP

Cricket™ Pro

Advanced F-Mount Image Intensifier adapter for single photon or low light level imaging

The Cricket™ Pro is a high-end plug & play camera attachment enabling high resolution, low light level & ultra high speed functionality for professional F-Mount cameras. Designed around the Photonis 25 mm Image Intensifier Tube (IIT), and fitted with high efficiency relay-optics, the Cricket™ Pro offers unprecedented image quality and double light output.[1]

Fully integrated power & gating electronics result in cost effective and ready to use camera upgrade. The Cricket™ Pro offers an unmatched standard for image quality and connectivity.

[1]Compared to Photonis Cricket™[2]

Application example: Cricket™ Pro with coupled optics and scientific camera attached

Key Features

- F-Mount Lens / Camera Interface
- Full 25 mm useable image
- Gating Down to 3 ns with 3 MHz burst
- Extended choice in Photonis IIT's (25 mm & 18 mm)
- Fully Plug-and-Play Device
- Three times quicker setup time[2]

[2]Compared to Photonis Cricket™[2] integrated manual gain and operating mode control.

Applications

- Ultra High-Speed Imaging
- Combustion Research
- High Energy Physics
- Optical Read-Out Time Projection Chambers

Contact us for expert advice on your application

Cricket™ Pro Parts and General Specifications

Mechanical Connections

Lens Mount Interface	F-mount (Optional: Other Standards)
Camera Mount Interface	F-mount (Optional: Other Standards)

Electrical Connections

PSU	USB-C or LEMO 0S (fast gating option)
Gain Control	Internal or External by LEMO 00 (0-5V)
Gating (Optional)	SMA (50Ω) (0-5 Volt TTL)

Mechanical Specifications

Housing Material	Aluminium (Anodized)
Housing Dimensions (HxWxL)	194 x 115 x 73 mm
Weight	Approximately 1300 grams

Optical Specifications

Image Circle Diameter	25 mm
Magnification	1 : 1
Vignetting (Center-to-Rim)	< 3%
Focusing	Adjustable Front Fine Focus

Exploded view of the **Cricket™ Pro**

Cricket™ Pro Exploded View Explained

- The low light level image is intensified by the IIT (Image Intensifier Tube) and via the relay optic projected on the imaging sensor of a camera. Gain and gating are controlled by integrated electronics.

Cricket™ Pro Image Intensifier Specifications

Image Intensifier Options	
Image Intensifier Diameter	18 mm or 25 mm
Photocathode	Hi-QE range, SolarBlind or Broadband (Hi-QE Green & Red only for 18mm IIT)
Microchannel Plate	High Resolution, Hi-CE (Collection Efficiency), High Dynamic Range (Optional)
Phosphor Type	P43 or P46

Standard gating (Optional)		Fast gating (Optional)	
Gate Unit	Integrated	Gate Unit	Integrated
Gate On/Off	0-5 Volt (TTL)	Gate On/Off	0-5 Volt (TTL)
Gate On/Off Time (Hi-QE Red)	30 ns	Gate On/Off Time	3 ns
Gate On/Off Time (Other)	200 ns	Gate Repitition Rate	300 kHz
Gate Repetition Rate	20 kHz	Gate Repitition Rate (Burst)	2.5 MHz
Delay Time (Gate to Cathode)	100 ns	Delay Time (Gate to Cathode)	100 ns
Rise Time	20 ns	Jitter	30 ps RMS
Fall Time	20 ns		

Image Intensifier Tube: Basic Operation

The IIT is the actual image intensification device embedded in the Cricket™Pro and is capable of enhancing a low light level up to 2.000.000 times in the case of a double MCP based 18 mm IIT.

The optical image input is converted to photoelectrons at the Photocathode. The photoelectrons are drawn by an electrical field into the MCP where they impinge multiple times on the inner walls and thereby multiplies several thousands of times.

The electrons then hit the phosphor screen where they are converted back to an optical image.

Configuring the Right IIT for Your Cricket™ Pro

In order to configure the right Cricket™Pro Image Intensifier Tube matching your application, please consider the following key IIT parts:

Photocathode

Select a photocathode matching the spectral region of interest of the phenomena you want observe. Choose a Photonis SolarBlind, Broadband or Hi-QE photocathodes, and make your camera sensitive in the UV, VIS or NIR (120-900nm).

MCP Type

The dual MCP (Chevron) setup enables single photon sensitivity (18 mm only). Thanks to Hi-CE MCP's a Collection Efficiency of >95% is achieved. Choose the high dynamic range MCP option for high linearity in direct imaging.

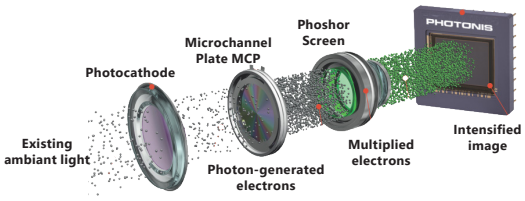
Gating

Choose between the normal gating or fast gating option. A gate unit is integrated in the Cricket™Pro. Repetition rate up to 300 kHz and 2.5 MHz in burst mode.

Phosphor

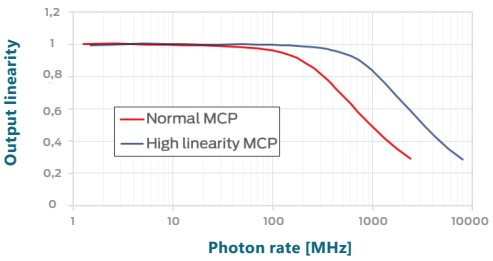
Depending on imaging speed, choose the P43 phosphor for high efficiency and frame rates up to 1000 frames per second or the P46 phosphor for up to 400k frames per second.

Working Principle

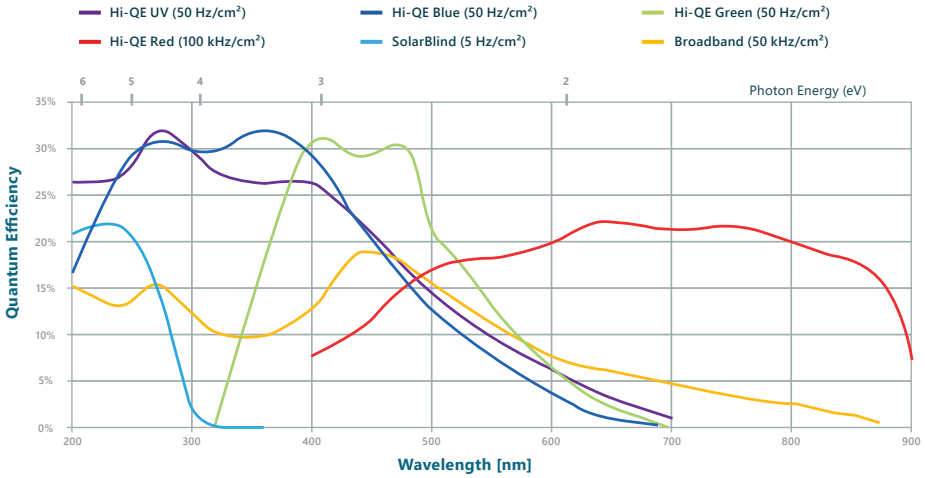


Single MCP illustration

MCP Linearity

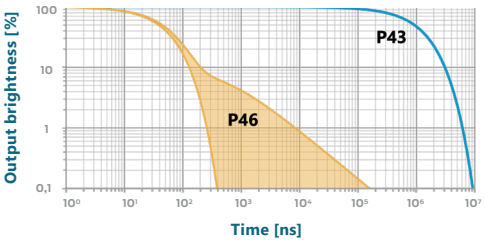


Photocathode Overview



Typical performance at 20°C. Cooling the photocathode reduces the dark count by about a factor of 2, every 5°C.

Phosphor Decay



science@exosens.com
exosens.com

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