SINGLE PHOTON IMAGING
DUAL MCP

LOW LIGHT LEVEL IMAGING
SINGLE MCP

PHOTONIS
EXOSENS GROUP

Cricket™²

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

The Cricket™² is a plug & play camera attachment enabling ***single photon imaging*** or ***low light level imaging*** and ***extreme high shutter speeds*** for CMOS and CCD cameras. The Cricket™² fitted with a single- or dual MCP (Chevron) based IIT (Image Intensifier Tube) enables an all in one camera upgrade for single photon- and low light level imaging. By straight forward C-Mount attachment and USB power supply, the Cricket™² offers an unmatched standard for connectivity.

Available with ***full range of Photonis Hi-QE photocathode*** based IITs with market leading QE (Quantum Efficiency) covering the full spectral range from 130nm (UVC) up to 900nm (NIR).

Application example: Cricket™² with coupled optics and scientific camera attached

Key features

- Single or Dual MCP (Chevron)
- Hi-CE (Collection Efficiency) MCPs
- High Gain Up to $2x10^6$
- High Speed Gating Down to 3 ns
- Available with Full Hi-QE Photocathode Range

Applications

- High Energy Physics
- Quantum Assisted Optical Interferometry
- Optical Readout for Time Projection Chambers
- Single Photon Imaging

Contact us for expert advice on your application

Cricket™² Parts and General Specifications

Mechanical connections

Lens mount interface	c-mount
Camera mount interface	c-mount

Electrical connections

PSU	Micro-USb (100 mW @ 5 Volt)
Gating (Optional)	SMA Connector (50 Ω)
Gain control integrated	Lemo Connector (0-5V)

Mechanical specifications

Housing material	Aluminium (Black anodized)
Housing dimensions (HxWxL)	95x58x112 mm
Weight	450 grams

Optical specifications

2/3" Sensor format	4:3 aspect ratio
1/1.2" Sensor format	16:10 aspect ratio
Magnification	1:1

Exploded view of the Cricket™²

Cricket™² Typical Application Example

- The c-mount in and c-mount out mounting enables easy coupling of a wide range of optics, cameras and microscopes. Optionally a c-mount to f-mount adapter can be applied to attach devices fitted with a f-mount.

Cricket™² Image Intensifier Specifications

Image Intensifier	
Input window	Quartz or Glass [Fiber/MgF2 optional]
Photocathode	Hi-QE range, SolarBlind or Broadband
Microchannel Plate	High resolution, Hi-CE (Collection efficiency) [High dynamic range optional]
Phosphor Type	P43 or P46

Normal gating *(Optional)*		Fast gating *(Optional)*	
Gate unit	Integrated	Gate unit	External
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 repition rate	300 kHz
Gate repition rate	20 kHz	Gate repition 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™² and is capable of enhancing a low light level up to 2.000.000 times in the case of a double MCP based 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™²

In order to configure the right Cricket™² Image Intensifier Tube matching your application, please consider the following key Image Intensifier 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).

Gating

Choose between the normal gating or fast gating option. A gate unit is integrated in the Cricket™². Repetition rate up to 300 kHz and 2.5 MHz in burst mode.

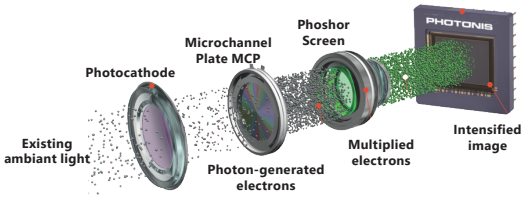
MCP Type

The dual MCP (Chevron) setup enables single photon sensitivity thanks to high resolution, Hi-CE MCP's a gain of up to $2x10^6$ can be achieved. Choose the high dynamic range MCP option for high linearity.

Phosphor

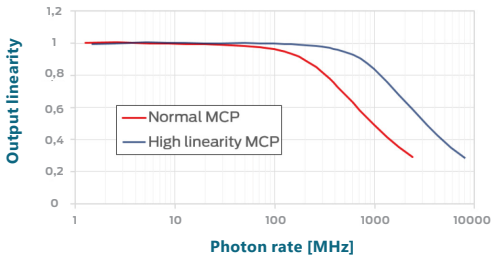
Depending on imaging speed, choose the P43 phosphor for high efficiency and frame rates up to 1000 frames per second or the P46 phosphor for up to 400k frames per second.

Working Principle

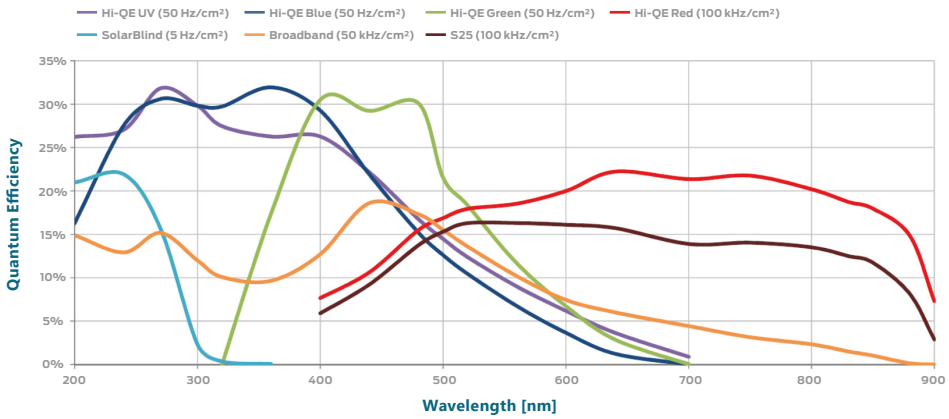


Single MCP illustration

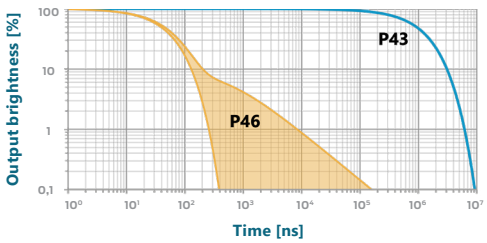
MCP Linearity



Photocathode Overview



Phosphor Decay



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