DATASHEET

PHOTONIS
Scientific Detectors

SINGLE PHOTON IMAGING
Dual MCP
Cricket™2

Advanced Image Intensifier adapter for single photon imaging applications

The Cricket™2 is a plug & play camera attachment enabling **single photon imaging an extreme high shutter speeds** for CMOS and CCD cameras. The Cricket™2 fitted with a **Dual MCP** (Micro Channel Plate) based IIT (Image Intensifier Tube) enables an all in one camera upgrade for **single photon sensitivity**. 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).

Key features

- Dual MCP (Chevron)
- Hi-CE (Collection Efficiency) MCPs
- High gain up to $2x10^6$
- High speed gating down to 3ns
- Available with full Hi-QE photocathode range

Applications

- High energy physics
- Quantum assisted optical interferometry
- Optical readout for time projection chambers
- Time correlated 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)

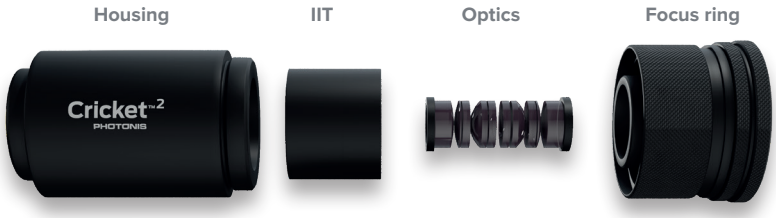
Mechanical specifications

Housing material	Aliminium (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

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



Electronics: PSU, Gating (optional), Gain

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
Micro Channel Plate	High resolution, Hi-CE (Collection efficiency) [High dynamic range optional]
Phosphor type	P43 or P46

Normal gating (Optional)

Gate unit	Integrated
Gate on/off	0-5 Volt (TTL)
Gate on/off time (Hi-QE Red)	30ns
Gate on/off time (Other)	200ns
Gate repition rate	20 kHz
Delay time (gate to cathode)	100 ns
Rise time	20 ns
Fall time	20 ns

Fast gating (Optional)

Gate unit	External
Gate on/off	0-5 Volt (TTL)
Gate on/off time	3ns
Gate repition rate	300 kHz
Gate repition rate (burst)	2.5 MHz
Delay time (gate to cathode)	100 ns
Jitter	30 ps RMS

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 4000 frames per second.

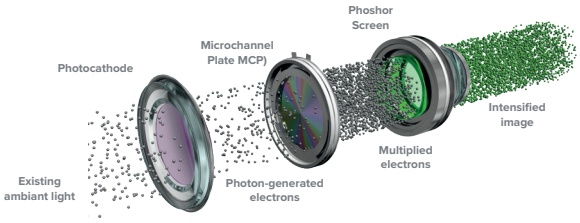
Image Intensifier Tube:

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.

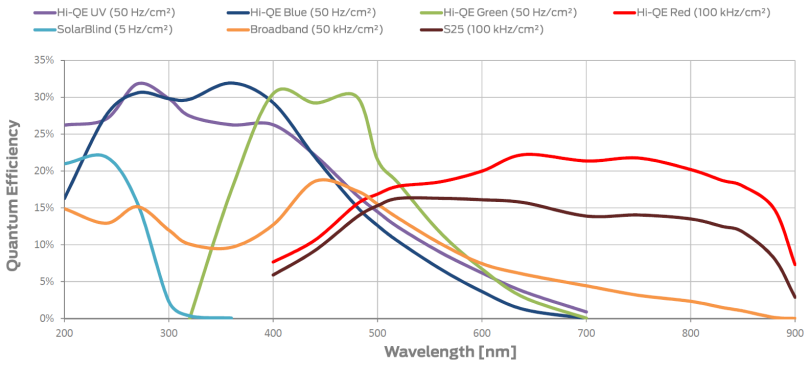
The optical image input is converted to photoelectrons at the Photocathode. The photoelectrons are drawn by an electrical field into the MCP where they impinge multiple times on the inner walls and thereby multiplies several thousands of times.

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

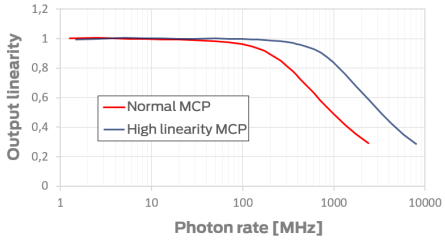


Single MCP illustration

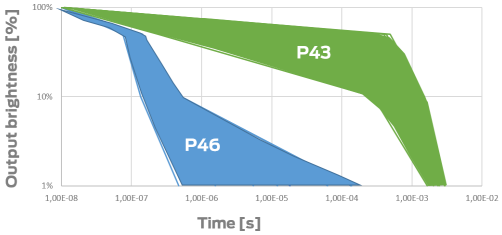
Photocathode overview



MCP Linearity



Phosphor decay



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