

## LOW LIGHT LEVEL IMAGING

### Single MCP

# Cricket™<sup>2</sup>



### Advanced Image Intensifier adapter for low light level imaging applications

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

**High speed gating** down to 3ns for **time-domain imaging** using the photocathode as electro-optical shutter. High repetition rate up to 300 kHz and 2.5 MHz in burst mode. Cricket™<sup>2</sup> is an all in one solution with integrated optics and electronics.

#### Key features

- High resolution up to 64 lp/mm
- High speed gating down to 3ns
- Available with full Hi-QE photocathode range
- Hi-CE (Collection Efficiency) MCPs
- High dynamic range

#### Applications

- High speed imaging of turbine blades
- Fluorescence Lifetime Imaging (FLIM)
- Engine combustion analysis
- Contact us for expert advice on your application

#### Cricket™<sup>2</sup> 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



Electronics: PSU, Gating (optional), Gain



Exploded view of the Cricket™<sup>2</sup>



Application example: Cricket™<sup>2</sup> with coupled optics and scientific camera attached

#### Cricket™<sup>2</sup> 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™<sup>2</sup> Image Intensifier specifications

### Image Intensifier

<b>Input window</b>	Quartz or Glass [Fiber/MgF2 optional]
<b>Photocathode</b>	Hi-QE range, SolarBlind or Broadband
<b>Micro Channel Plate</b>	High resolution, Hi-CE (Collection efficiency) [High dynamic range optional]
<b>Phosphor type</b>	P43 or P46

#### Normal gating (Optional)

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

#### Fast gating (Optional)

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

## Configuring the right IIT for your Cricket™<sup>2</sup>

In order to configure the right Cricket™<sup>2</sup> 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

For time resolved imaging the photocathode can be used as an electro-optical shutter. Choose between the normal gating or fast gating option. A gate unit is integrated in the Cricket™<sup>2</sup>. Repetition rate up to 300 kHz and 2.5 MHz in burst mode.

### MCP Type

The single MCP setup with Hi-CE technology ensures a resolution of up to 64 lp/mm and a collection efficiency exceeding 90%. 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.

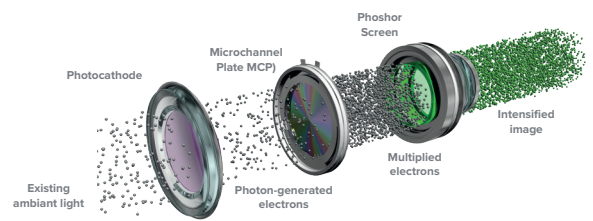
## Image Intensifier Tube:

### Basic operation

The IIT is the actual image intensification device embedded in the Cricket™<sup>2</sup> and is capable of enhancing a low light level image up to 400.000 times in the case of a single MCP based IIT.

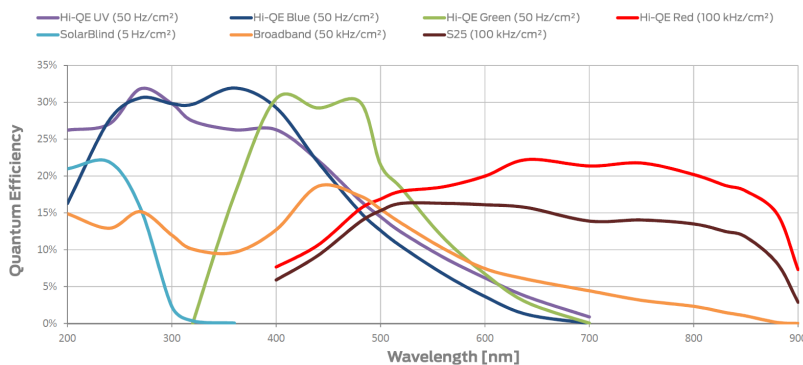
The optical image input is converted to photoelectrons at the Photocathode. The photoelectrons are drawn by an electrical field into the MCP where they impinge multiple times on the inner walls and thereby multiplies several thousands of times.

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

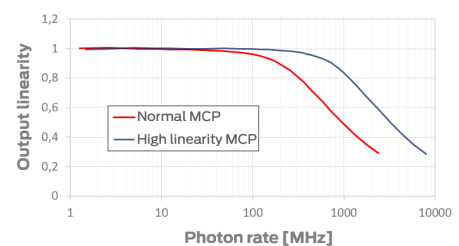


Single MCP illustration

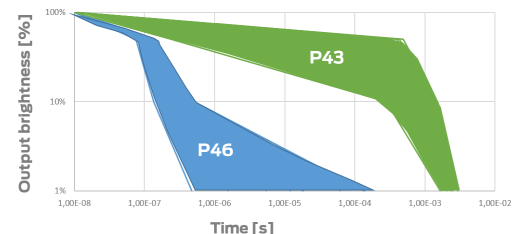
### Photocathode overview



### MCP Linearity



### Phosphor decay



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