



PRODUCT LEAFLET

TECHNICAL SPECS

APPLICATION NOTE

## X-TREME – the ultimate compact high speed camera for use under the most demanding environmental conditions.

### Applications

The X-TREME camera is used in applications where no compromise in regards of camera reliability taking image data under severe environmental conditions is accepted. The self-containing camera is tested according MIL-810, DO-160, MIL 461 standards

Store separation tests – the camera meet and exceeds standard for most airborne applications. Due to its compact size the camera fits in existing installations. The flexible electronic interface grants an easy adaption to existing tests procedures. The camera adapts to the aircraft – not the aircraft to the camera.

UAV / UCAV – Where it is necessary to transmit live data recorded by the camera to the ground station for review X-TREME is ready to integrate into the aircraft telemetry system by the built in Gigabit Ethernet interface (Base 1000/100/10). During transfer the camera can record in the internal memory for up to 8'000 frames /second.

Naval Applications- When a camera is required close to the action where sea water is present X-TREME is the choice. The sealed camera will deliver data where other instruments quit

### Why the X-TREME?

Self contain camera- The X-TREME is a self containing camera that reliable works in hot, cold and wet environments. Nothing to worry about the environmental conditions before start collecting image data.

All-in-one concept – Pre-programming of camera in the lab does not make any PC connection necessary to start recording. The video output gives all the required information to adjust the camera on the scene

Designed for its use – Unlike other camera the X-TREME is not just a ruggedized camera but is engineered for working in tough environments. The design with lots of inputs from world wide renowned defence application test engineers was tested by an independent test lab to proof its reliability in the field



## Technical specifications

<b>Product type</b>	Digital high speed camera
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<b>Image Sensor</b>	CMOS Progressive Sensor
<b>Image Sensor</b>	Monochrome or color (with Bayer pattern)
<b>Pixel size</b>	12 µm
<b>Dynamic range</b>	8- or 10bit (user selectable)
<b>Sensitivity</b>	ISO 1200 (monochrome), ISO 600 (color)
<b>Image Resolution</b>	1280 x 1024 pixels
<b>Frame rate</b>	500 fps @ 1280 x 1024 pixels
<b>Max. frame rate</b>	8,000 fps
<b>ROI</b>	Free selectable by software
<b>Shutter type</b>	Global electronic shutter
<b>Shutter exposure times</b>	4 µsec to 1/frame rate
<b>Frame synchronization</b>	Sync in, sync out (TTL)
<b>Multi-camera operation</b>	

<b>Image memory</b>	Built-in, DRAM
<b>Image memory type</b>	Circular buffer
<b>Standard capacity</b>	1.3 GB
<b>Optional</b>	2.6, 5.2, 10.4 GB
<b>Sequence length</b>	2 secs @ 1280 x 1024 / 500 fps (1.3 GB image memory) 4 secs @ 1280 x 1024 / 500 fps (2.6 GB image memory) 8 secs @ 1280 x 1024 / 500 fps (5.2 GB image memory) 16 secs @ 1280 x 1024 / 500 fps (10.4 GB image memory) Sequence length can be extended by reducing the image resolution resp. frame rate

<b>Data Interface</b>	Gigabit Ethernet
<b>Data Interface (Live Stream)</b>	JPEG-compressed image via Gigabit Ethernet
<b>Video Interface</b>	PAL / NTSC (analog) or SDI (digital)
<b>Memory Interface</b>	Built-in CF interface, accepting CF cards for non-volatile data storage
<b>Event markers</b>	1 (TTL, input), control the 'event markers' Other configuration of status lines available on request

<b>Power supply</b>	28 VDC (24...36 VDC)
<b>Power consumption</b>	20W
<b>Battery (optional)</b>	Built-in, rechargeable NiMH battery.

<b>Dimensions</b>	85 x 85 x 200mm / 3 3/16 x 3 3/16 x 7 7/8"
<b>Weight</b>	2kg / 4lbs
<b>Camera mounting</b>	according user specifications

### Resolution vs. frame rate

The X-TREME offers a frame rate of 500fps at full image resolution of 1280 x 1024 pixels. The following configurations can be selected via the included AOS Imaging Studio control software:

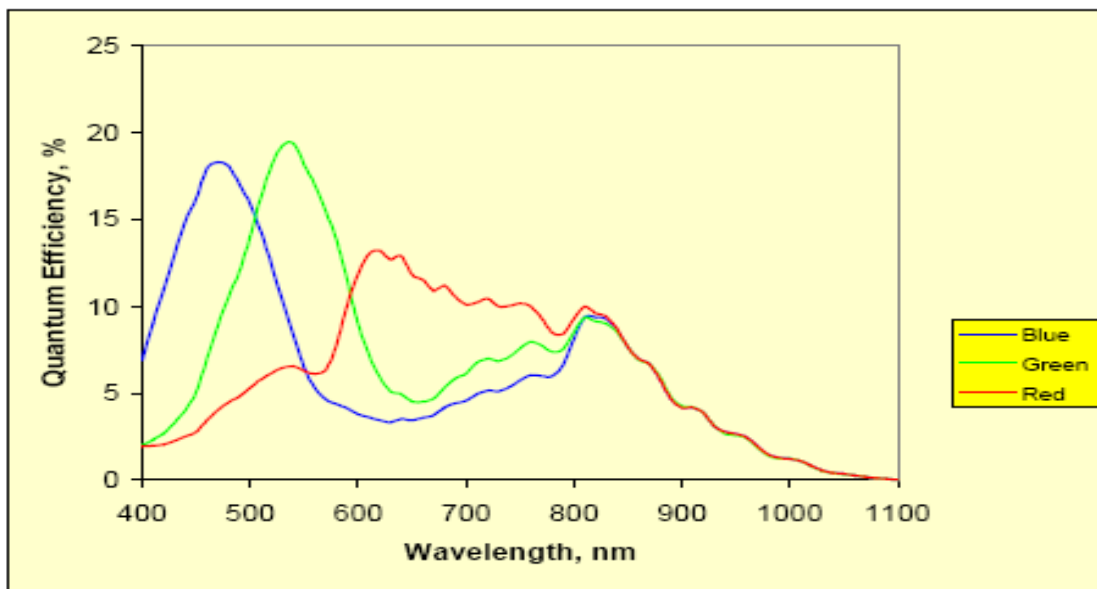
Image resolution	Frame rate (fps)
1280 x 1024	500
800 x 600	1,000
1280 x 512	1,000
1280 x 256	2,000
1280 x 128	4,000
1280 x 64	8,000

### Control PC – minimum requirements

<b>CPU</b>	Pentium 4, 2 GHz with MMX
<b>DRAM</b>	2 GB
<b>HDD</b>	60 GB
<b>Interfaces</b>	GigE
<b>OS</b>	MS Windows 2000, XP PRO, VISTA, Win7

The control PC for an AOS high speed camera has to meet or exceed these minimum requirements for a reliable, convenient camera performance. PC's with lower specifications may result in a camera performance below the indicated ones.

## Spectral response



## Connectors

The X-TREME features 2 connectors:

<b>Connector 1</b>	<b>8 pin connector for Gigabit Ethernet</b>
<b>Connector 2</b>	<b>External synchronization, trigger, video out etc.</b>
<b>Connector type</b>	<b>Mighty Mouse series 801</b>

The X-TREME can also be equipped with different connectors for extended functionality from other manufacturers (please contact us for advise)

## Tests and approvals

### Shock

<b>Shock (each direction)</b>	100g
<b>Saw tooth pulse with a peak acceleration</b>	10g ± 10%
<b>Total time duration</b>	11msec (nominal)

### Vibration

<b>Vibration (RTCA/DO 160D, paragraph 8)</b>	Test Category 5 Level Curves W	RTCA/DO-160E, paragraph 8, 8.5
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### Acceleration

<b>Acceleration Gust load factors</b>	nz: 10g, -10g	MIL-STD-810E, Method 513
<b>Acceleration Maneuvering load factors</b>	nz: 10g, 10g nx: 10g, 10g ny: 10g, 10g	MIL-STD-810E, Method 513

**Tests and approvals** (cont. from previous page)**High altitude**

<b>Low air pressure</b>	35,000ft (11km)	RTCA/DO-160E, paragraph 4.6.1
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**Temperature**

<b>Ambient temperature LOW</b>	-50°C	RTCA/DP-160E, paragraph 4
<b>Ambient temperature HIGH</b>	+55°C	RTCA/DP-160E, paragraph 4
<b>Survival temperature</b>	-55 / +70°C	RTCA/DP-160E, paragraph 4
<b>Temperature variation</b>	-50°C / +55°C / -50°C  Test Category A Temperature change rate is 5 degrees per minute	RTCA/DP-160E, paragraph 5
<b>Temperature shock</b>	-50°C / +55°C  Change time < 1 minute from -50°C to +55°C and vice versa	MIL-STD-810E Method 503

**Humidity, Waterproofness**

<b>Humidity</b>	Category 10	RTCA/DP-160E, paragraph 6
<b>Waterproofness</b>	IPX5	IEC 60529: 1992 (higher standard optionally)

**Salt, sand and dust**

<b>Sand and dust</b>	Category D	RTCA/DP-160E, paragraph 12
<b>Salt spray</b>	Category S	RTCA/DP-160E, paragraph 14

**Electromagnetic interference (EMI)**

<b>Bonding</b>	EN 3371	Category I
<b>Audio-frequency conducted susceptibility</b>	RTCA-DO160D, paragraph 18	Category Z
<b>Induced signal susceptibility</b>	RTCA-DO160D, paragraph 19	Category A
<b>Radio-frequency susceptibility</b>	RTCA-DO160D, paragraph 20	Category T
<b>Conducted RF interference</b>	RTCA-DO160D, paragraph 21	Category H
<b>Radiated RF interference</b>	RTCA-DO160D, paragraph 21	Category H
<b>Voltage spike</b>	RTCA-DO160D, paragraph 17	600 V



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