M-EM High-speed camera

The M-EM is the ultimate rugged, shockproof high speed camera.

Tested to fulfill MIL 810 environmental specifications, the M-EM is ready to meet the most demanding applications in test ranges, when mounted on aircraft, or in other demanding environments.

Why the M-EM?
The M-EM is particularly well suited for all applications where a compact, portable, high speed camera may be used under the toughest environmental conditions. The highly light-sensitive sensor provides 1280 x 800 pixels, with framing speeds of up to 4000 fps. These features are embedded in a compact and rugged design that suits even the most ambitious application. The M-EM is designed and officially tested in accordance with MIL 810 and MIL 461 standards. Offering a wide range of signals for external control and feedback on camera status during operation, the M-EM is a genuine all-in-one camera. Fast download of your image sequence is achieved via Gigabit Ethernet or Optional CFast removable cards. The M-EM also supports IRIG-B input for synchronization and time stamping. Further options are available, such as extended run time via an external battery pack and HD-SDI. Semi-customizable camera casings with M-EM electronics inside are also available allowing the camera and lens to be placed in unique spaces.

Unique features

- **Excellent image quality** – M-EM cameras incorporate a high-accuracy image reconstruction algorithm, which is a primary element for superb image quality at high resolutions.
- **Environmental tests** – M-EM is tested in accordance with MIL 810 and MIL 461 standard by an independent and certified test laboratory.
- **High sensitivity** – The M-EM is a high resolution light sensitive camera ideal for recording under low light conditions.
- **Semi-customized camera** – In need of a camera that fits your specific compartment? Tell us about your demands. AOS can tailor an M-EM specifically to your needs without losing any of the benefits and environmental tests. Typical examples of this are different form factor or customized connectors for ease of integration.

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AOS Technologies AG

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Frame rates vs resolution

1280	864	3700 fps
1280	800	4010 fps
1280	720	4450 fps
1280	630	5050 fps
1280	512	6220 fps

Recording time

Memory Size	4 GB	8 GB	16 GB
1280x800@4000 fps	1 sec	2 sec	4 sec

Optical/Sensor specifications

Image Sensor	CMOS Sensor
Pixel Size	14 microns
Light Sensitivity	ISO 10'000 (monochrome), ISO 6000 (color)
Dynamic Range	10 Bit
Shutter Type	Global, independent of frame rate
Exposure Time	Free adjustable from 1 µsec to 1 / framing rate by software
Lens Mount	C-Mount or optional F-Mount

Camera and control features

Image Memory	4 GB standard up to 16 GB optional
Nonvolatile Memory	Optional CFast flash card interface. Camera can save image data on flash disk w/o PC attached
Power	10–36 VDC / 20–30 Watts depending on options and extensions
I/O Tolerance	TTL level, all I/O are 0–24 V tolerant
LED Display	LEDs on back and front indicates camera status
Reset	Reset function to reset camera status w/o deleting image memory
Power On/Off	Switch on/off, Remote Switch on
Battery	Re-chargeable NiMH battery inside for up to 20 min autonomous operation of camera, depending on options installed
Trigger Delay	Programmable up to 65 sec
Trigger De-bouncing	Trigger filtering to eliminate false triggering by external devices
Trigger Modes, Positions	Pre-post recording, freely adjustable in steps of 1 frame up to total camera memory
Timing	High precision time base, temperature compensated
Multi-Buffer	Split buffer for up to 100 individual sub-buffers
Auto Exposure	Auto exposure for automatic brightness control
Auto-Download	Auto download to PC for 24/7 recording or automatic download to optional flash card
Pre-Program of Camera	M-EM may be pre-programmed to perform a variety of functions when the camera may be inaccessable
OSD	Information on camera, recording features, time stamp, and event marker may be added in image data. Position of OSD is set by user

Certifications (pending)

CE	In compliance with relevant standards
EMC Tests	In compliance with MIL-STD-461E
Environmental Tests	In compliance with MIL-STD-810
Ambient Air Condition	Meth. 501.4, Proc. I, Tab. 501.4II
Severe Cold	Meth. 502.4, Proc. I, Tab. 502.4II
Temp. Shock	Meth. 503.4, Proc. I, Tab. 503.4II
Low Altitude	Meth. 500.4, Proc. II
Vibration	Meth. 514.5, Proc. I, Cat. 12, Fig. 514-5C8
Mech. Shock	Meth. 516.5, Proc. I, Tab. 516.5-1
Humidity	Meth. 507.4, Fig. 507.4-1 modified (2 cycles)

Imaging studio features

Imaging Studio	Software suite to parameterize and control camera, handle data download and conversion of native files into most common single images and movie formats. Runs on Windows 10.
Parameterization	Set all camera parameters for recording by convenient and easy-to-use software interface supports graphical setting of resolution
Display	Display multiple cameras simultaneously
Editing	Play back, edit and save sequences after recording with few clicks
Overlay	Overlay of recorded image with user adjustable opacity
Motion Analysis	Simple 2D analysis for displacement, velocity angles with automatic tracking of up to 5 points included in Imaging Studio V4
Export	Export of AOS native file format to avi, mpeg, mpeg4, bmp, tif, png, jpg
Image Processing	Manual or automatic color correction and white balance functionality
Batch Converter	Convert native files to movie files using off-line batch conversion

Data interface

Data Interface	Gigabit Ethernet (10/100/1000) with lockable RJ45 connector Optional: Ethernet on 8 pin LEMO connector
WIFI	Optional: Wireless interface to setup and pilot camera 2,4 Ghz / 5 Ghz, 802.11a/g/n
I/O Interface	Solid 14 pin LEMO connector
Synchronization	Sync in / Sync out for phase-locked master-slave operation with other cameras or synchronization to external frequency
Armed Out	Armed out indicates camera is in recording mode and ready to receive trigger
Trigger In	Trigger input, rising, falling edge, TTL, switch closing/opening, Shock trigger
Triggered Out	Indicates camera is triggered
Remote Switch On	Switch on camera by simple 2 wire connection over a distance of up to 100 m (300 feet)
Event Marker	Event marker to record/mark events during image data acquisition
Strobe	Strobe out to synchronize external equipment to camera. Pulse width represents shutter time
HD-SDI	High Definition Serial Digital Interface in accordance with SMPTE 292M for live view and playback on camera
IRIG-B	IRIG-B 122 input for frame synchronisation and time stamping

Physical specifications

Size & Weight	width: 75 mm / height: 75 mm / length: 130 mm / 1.3 kg width: 2.95" / height: 2.95" / length: 5.1" / 2.9 lb
Operating Temperature	-10 … + 45 °C / +14 … +113 °F
Storage Temperature	-40 … +70 °C / -40 … +158 °F
Shock Resistance	150 G / 10 msec all axis, spikes up to 200 G
I/O Connector	LEMO type ref. FGG.2B.314.CLAD72Z (cable type)
CE	In compliance with relevant standards
Mounting	¼" UNC thread, bottom / M6 mounting threads on 4 sides

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