AOS Technologies AG

S-MIZE EM High Speed Camera

S-MIZE EM – the rugged, ultra compact high speed camera that meets MIL 810 specifications

Tested according MIL 810 environmental specifications the S-MIZE EM is ready to meet the most demanding applications such as mounted in aircrafts to record store separation procedures.

The S-MIZE EM is particularly suited for all applications where a compact, portable camera is used under the most demanding environmental conditions. The camera bears a very light sensitive sensor and the sophisticated image quality algorithm embedded in the camera suit the most ambitious application even under dim light conditions. The S-MIZE EM is designed and officially tested according MIL 810 and MIL 461 standards. Offering a wide range of signals for external control or feedback on camera status during tests the S-MIZE EM is a genuine all-in-one camera. Fast download of your image sequence is achieved via Gigabit Ethernet. S-MIZE EM does support IRIG-B data input for synchronization and/or data stamp. Multiple options are available such as an additional External Battery Pack, Compact Flash Card in camera, live SDI or analog video out to just name a few. Semi-customized camera design based on S-MIZE EM to fit into specific compartments is available as well.

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Unique features

- **Excellent image quality** – S-MIZE EM cameras incorporate a highly light sensitive sensor and a high-accuracy image reconstruction algorithm, which is a primary element for superb image quality, and highly rated by independent users of the S-MIZE EM.
- **Ultra compact – all in one** – S-MIZE EM is an ultra-compact all in one camera ready to fit into tight areas under demanding ambient conditions where other cameras simply do not. The built-in battery allows camera operation without external power cables and power supplies and insures safe back up of your valuable recorded image data.
- **High Sensitivity** – the S-MIZE EM is a very light sensitive camera ideal for recording with less light and shorter shutter times to minimize motion blur of fast moving objects.
- **Semi-Customized Camera** – In need of a camera that fits into your specific compartment? Let us know your demands. AOS offers engineering a S-MIZE EM specifically to your needs without losing any of the benefits and environmental tests. Typical examples are other form factor or custom specific connectors for ease of integration.

S-MIZE EM – Key Specifications

Frame rate vs resolution vs recording time (partial)

Resolution ►	Resolution @ fps	Resolution @ fps	Resolution @ fps	Resolution @ fps	Resolution @ fps	Resolution @ fps	Resolution @ fps	Resolution @ fps
	1280 x 1024 @ 500 fps	900 x 700 @ 1000 fps	800 x 600 @ 1250 fps	640 x 480 @ 1925 fps	512 x 512 @ 2110 fps	320 x 240 @ 6110 fps	256 x 256 @ 6680 fps	128 x 128 @ 17'500 fps
Memory ▼	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time
1.3 GB	2.0	2.1	2.2	2.2	2.3	2.8	3.0	4.6
2.6 GB	4.0	4.2	4.4	4.4	4.6	5.6	6.0	9.2
5.2 GB	8.0	8.4	8.8	8.8	9.2	11.2	12.0	18.4
10.4 GB	16.0	16.8	17.6	17.6	18.4	22.4	24.0	36.8

Table shows typical resolution vs. fps, Resolution is freely adjustable, fps = max fps @ resolution, fps adjustable by software in steps of 1 fps, max 100'000fps @ reduced resolution.

Optical/Sensor specifications

Image Sensor	1280 x 1024 pixel with 10 Bit dynamic range, monochrome or color version
Sensor Size	14 µm pixel size / 17.8 x 14.3 mm @ 1280 x 1024 pixel
Light Sensitivity	Min ISO 3200 (monochrome), ISO 2400 (color)
Dynamic Range	10 Bit
HDR Mode	High Dynamic Range Mode for higher image dynamic up to 14 Bit, free adjustable by slider in control software
Pixel Correction	Built-in Pixel correction for highest image accuracy
Shutter Type	Global, independent of frame rate
Exposure Time	Free adjustable from 2 µsec to 1 / framing rate by software
Mount	C-Mount, optional F-Mount

Camera and control features

Image Memory	Standard: 1.3 GB, optional 2.6 / 5.2 / 10.4 GB
Nonvolatile Memory	Optional Flash card interface for up to 64 GB flash disk in camera. Camera can save image data on flash disk w/o PC attached
Power	24–36 VDC / 12–15 Watts depending on extensions
I/O Tolerance	TTL level, all I/O are 0–24 V tolerant
LED Control	LED on back and front for indication of camera status
Reset	Reset function to reset camera status w/o affecting image memory
Power On/Off	Switch on/off, Remote Switch on
Battery 180° Version	Re-chargeable NiMH battery inside for up to 15 mins autonomous operation of camera, optional external battery for up to 2.5 hrs autonomous operation is available
Battery 90° Version	Re-chargeable NiMH battery inside for up to 30 mins autonomous operation of camera, Optional external battery for up to 2.5 hrs autonomous operation is available
Trigger Delay	Programmable up to 65 sec
Trigger Windowing/ De-bouncing	User programmable trigger window to eliminate false triggering by external devices
Trigger Modes, Positions	Pre-post recording, freely adjustable in steps of 1% of total camera memory
Timing	High precision time base, temperature compensated
Multi-Buffer	Split buffer for up to 32 individual sub-buffers
Auto-Download	Auto download to PC for 24/7 recording or automatic download to optional flash card until flash card full
Pre-Program of Camera	S-MIZE EM may be preprogrammed with a specific set of commands. Ideal when camera can no longer be accessed before test and switch on is possible only by remote switch on
OSD	Information on camera, recording features, time stamp, event marker may be added in image data, Position of OSD is set by user
IRIG-B	IRIG-B 122 input for synchronization and/or time stamp

S-MIZE EM 90° with CF card and External Battery Pack

Data Interface

Data Interface	Gigabit Ethernet (10/100/1000) with lockable RJ45 connector
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 working OK and is ready to receive trigger
Trigger In	Trigger input, rising, falling edge, TTL, switch closing/opening
Triggered Out	Indicates camera is triggered
Set_To_Rec	Used to set the camera from idle mode into recording
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

Physical specifications

Size 180° Version	74 x 71 x 80 mm / 700 gr (1.5 lb) (connectors on the back)
Size 90° Version	92 x 71 x 67 mm / 700 gr (1.5 lb) (connectors on the side)
Operating Temperature	-50 … + 55 °C / -58 … +131 °F
Storage Temperature	-55 … + 70 °C / -67 … +158 °F
Shock Resistance	100 G / 10 msec all axis, up to 200 G for spikes
I/O Connector	LEMO Type: FGG.2B.314.CLAD82Z ODU: S22LOC-P14MFG0-8200
CE	In compliance with relevant standards
Mounting	¼" UNC thread, bottom / M6 mounting threads on 4 sides

Extensions (change of camera size)

Width x height x length

		S-MIZE EM 180°	S-MIZE EM 90°
Video Out	PAL or NTSC format, SDI or analog Video out on camera for live view while set-up, recording. Playback sequence on screen	74 x 71 x 90 mm	99 x 71 x 67 mm
Flash Card Interface	Flash card interface with card lock and protection cover for up to 32 GB flash card memory	74 x 71 x 90 mm	107 x 71 x 67 mm
External Battery	External battery with charge supervision in software, connects to camera via separate interface, no additional cabling required – comes with 50 cm / 2 feet cable	Size unchanged	Size unchanged

Certifications

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)

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