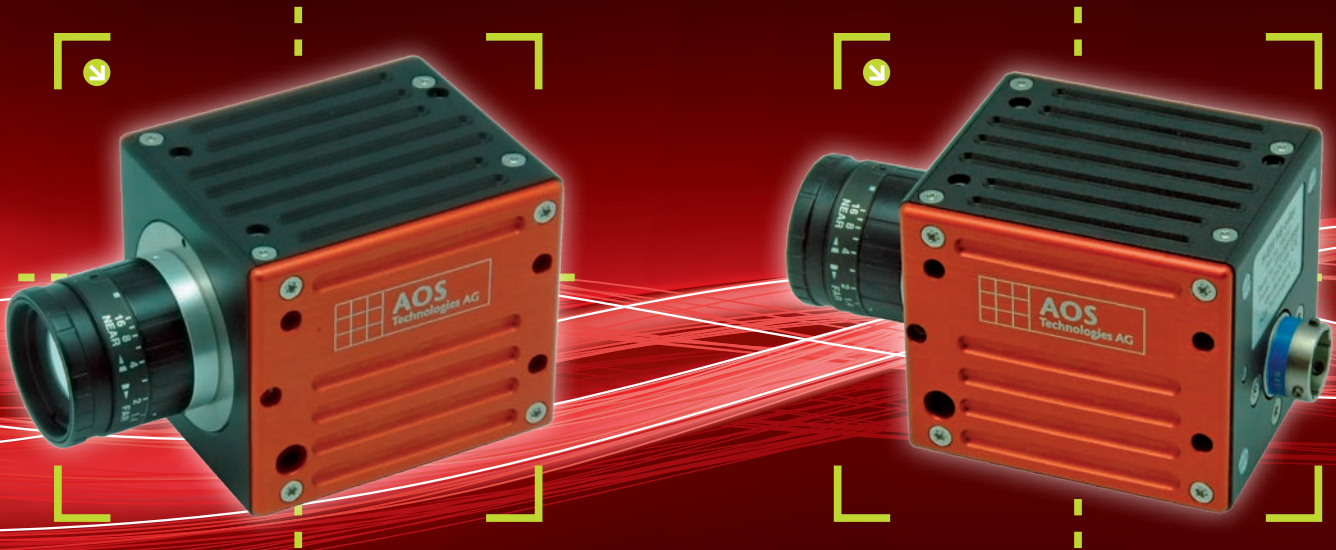# AOS Technologies AG

# H-EM 501 – a high speed streaming camera for tough environments



**H-EM 501 is a high speed camera that connects directly to a recording device via Gigabit Ethernet link. The camera is configurable by software and can record a maximum of 2 megapixels up to 90 fps. By reducing resolution, the H-EM 501 offers stunning data rates such as 1280 x 720 pixels @ up to 125 fps or 800 x 600 pixels @ up to 300fps. H-EM 501 is fully compliant with GigE Vision standards.**

H-EM 501 cameras are available in monochrome, color or as NIR (near infrared) version. Due to a sophisticated algorithm in the camera image frame rates not seen before over a standard Gigabit Ethernet link are achieved. This small compact high speed streaming camera fits into the tightest spaces. Nevertheless H-EM 501 with its camera control software leaves no compromise in view of functionality and analysis compared with competitive high speed cameras. Circular buffer recording, triggering by external discrete signals or by motion detection are available in the standard system. In addition, for longer recording time, you may stream directly to hard disk for minutes or hours making sure to capture the most intermittent events. Easy export of image data to the most common movie formats is one of the many features of the software. Last but not least a basic motion analysis software with automatic tracking features is included.

## Unique features for unique environments

- **Rugged** – H-EM 501 cameras are designed for use under harsh environments. The small camera fits into tightest spaces and is tested according MIL 810 environmental standards. Camera fits in tight locations or positions not possible before.

- **Long recording times** – H-EM 501 records and streams image data directly to your PC RAM or hard disk providing recording times of minutes or even hours. Analyze fast events in detail by taking high speed image data of the full event.

- **One cable** – Simply connect a single cable to the camera bearing all required data links. A standard MIL connector assures safe and reliable connection.

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## Typical 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 | Resolution @ fps |
|---|---|---|---|---|---|---|---|---|---|
| | 2048 x 1088 @ 85 fps | 1280 x 1024 @ 90 fps | 1280 x 720 @ 125 fps | 800 x 600 @ 300 fps | 640 x 480 @ 560 fps | 512 x 512 @ 700 fps | 352 x 352 @ 1000 fps | 256 x 256 @ 1370 fps | 128 x 128 @ 2620 fps |
| Memory ▼ | Recording time | Recording time | Recording time | Recording time | Recording time | Recording time | Recording time | Recording time | Recording time |
| 4 GB RAM | 7 secs | 11 secs | 12 secs | 9 secs | 8 secs | 7 secs | 11 secs | 15 secs | 32 secs |
| 500 GB HDD | 1 hr 5 mins | 1 hr 45 mins | 1 hr 50 mins | 1 hr 25 mins | 1 hr 10 mins | 1 hr 5 mins | 1 hr 40 mins | 2 hrs 20 mins | 4 hrs 50 mins |
| 1 TB HDD | 2 hrs 10 mins | 3 hrs 30 mins | 3 hrs 40 mins | 2 hrs 50 mins | 2 hrs 20 mins | 2 hrs 10 mins | 3 hrs 20 mins | 4 hrs 40 mins | 9 hrs 40 mins |

Table shows typical resolution vs. fps, resolution is freely adjustable within limitations of camera/sensor, recording time and fps depends on PC performance

## Camera/Sensor Specifications

| | | | |
|---|---|---|---|
| Image Sensor | H-EM 501 color | H-EM 501 monochrome | H-EM 501 near infrared |
| Light Sensitivity | ISO 2400 | ISO 3600 | 5.56 V / lux-sec |
| Image Sensor | 2048 x 1088 pixel with 8 Bit dynamic range, monochrome color or NIR , max 85 fps @ full resolution | | |
| Sensor Size | 5.5 µm pixel size / 2/3" (12.76 mm diagonal) | | |
| Dynamic Range | Sensor: 60 db, Output 8 Bit | | |
| Optical Fill Factor | 42 % | | |
| Shutter Type | Global, independent of frame rate | | |
| Exposure Time | Free adjustable from 13 µsec to 1 / fps by software | | |
| Power | 12 – 24 VDC / 6 Watts | | |
| Camera Mount | C-Mount / CS-Mount | | |

## Control Software

| | |
|---|---|
| Parameters | Camera control, recording settings, playback and data conversion |
| Auto-Store Function | Auto-store function in PC for 24/7 recording supported |
| Trigger Modes, Positions | Pre-post recording, adjustable by software to 0 % / 10 % / 25 % / 50 % / 75 % / 90 % / 100 % of total available recording time Re-arm after trigger for instantaneously new recording |
| Boost Mode | Record with lower frequency and on demand record with high frequency for a certain period of time and go back to lower frequency |
| Motion Detection | Motion trigger and motion event marking in file |
| Multi-Camera | Multiple camera on PC possible (depending on PC specifications) |
| Event Markers / Bookmarks | Events in the sequence can be tagged by bookmarks for easy orientation / finding |
| OSD | Information on camera, recording features, time stamp, camera name may be added in image data, Position of OSD is set by user |
| Motion Analysis | 2D basic motion analysis with auto-tracking feature for up to 5 points is optional available |
| Custom Specific | Extended functions for custom specific use are easy to integrate. Contact us for further details |

## Interface and Connector

| | |
|---|---|
| Data Interface | Gigabit Ethernet 1000 |
| Connector | All-in-one MS connector, Reference: MS27508E10F35PN Required cable connector: MS27473T10F35SN |
| I/O Tolerance of discrete Signals | TTL level, all I/O are 0 to +30 V tolerant |
| Trigger In | TTL level, max +30 V, Switch closing contact (requires AOS Power trigger adapter, included in delivery) |
| Standard | Camera complies with GigE Vision standard |

## PC Requirements

| | |
|---|---|
| Operation System | Win 7/ 8     32/64 |
| CPU | Pentium Core I5 or better |
| RAM | 4 GB or better |
| Hard Disk | 500 GB or better, SATA-3 standard **Separate HD for image data recording is strongly recommended in order to avoid damage to operation system partition** |
| Interface | – USB: To mount USB key for operation of camera – Gigabit Ethernet Interface: Capable of supporting 9 k jumbo frames – Alternative: PCI express slot for Gigabit Ethernet Interface   (supplied with camera) |
| Streaming to external Disk | Supported via external eSATA |
| Graphic Card | Supports Full HD Format 1920 x 1080 |
| Multiple Camera on PC | – Supported up to 4 but depending on PC performance – Individual Gigabit Ethernet card and individual hard disk per camera required **NOTE:** contact us for specific computer settings |

## Physical Specifications

| | |
|---|---|
| Size | 54 x 54 x 65 mm / 330 gr (0.7 lb) |
| Storage Temperature | -40 … +70 °C / -40 … +158 °F |
| Mounting Threads | M4 Mounting threads on all sides UNC ¼" on bottom and side for tripod mounting |

## Standards

| | |
|---|---|
| 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) |

## Scope of Supply

| | |
|---|---|
| | Camera |
| | Software on CD with USB key |
| | Power supply 12 V |
| | PCI express Ethernet card (desktop) and Ethernet express card (laptop) |
| | CS-Mount adapter |
| Optional | – Motion analysis software – Cable with assembled connector camera side (open wires on other side) – Camera test cable with connector for camera side and RJ45 / Lemo Power   connector / Trigger connector for test use |

Your local AOS partner:

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