

*Digital high speed camera*

# HAS-EF

**5.2 Mega pixel 2,560 × 2,048 resolution  
at 250 frames / second  
6 GB Embedded memory**



**HAS-EF is a high speed camera with 1-inch CMOS sensor and 2,560 × 2,048 effective pixels that can shoot 250 fps at full resolution, 500 fps at full HD, 1,400 fps at VGA, and up to 14,000 fps by limiting the pixel area. Perfect for multiple high speed camera imaging, with 6 GB embedded memory, in one compact solution.**

- Battery operation is possible.
- 6 GB embedded memory allows you to record 3,000 frames at full HD and 20,000 frames at VGA.
  - Good balance between high resolution and high frame rates.
  - Fully synchronized multiple high speed cameras with just one laptop PC.
    - Internal / External sync
    - 12 bit A / D

Well suited for all kinds of research / production engineering in behavior, fluid, sports science, biomechanical, robotics, machine vision, crash test, droplet, microscopy, trouble shooting, and more.

### Frame rate and pixel size

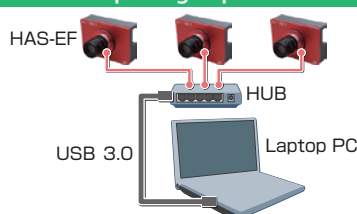
Pix	H	256	256	320	512	640	800	1,024	1,280	1,600	1,600	1,600	1,920	2,560	2,560	2,560	2,560	2,560
Fps	V	32	128	240	256	480	600	768	1,024	1,600	1,200	1,080	240	480	600	1,200	2,048	
14,000	●																	
10,000	○																	
8,000	○																	
5,000	○																	
4,000	○	●																
3,000	○	○																
2,700		○	●															
2,500		○	○	●														
2,000			○	○	○								●					
1,500				○	○									○				
1,400				○	○	●								○				
1,000				○	○	○	●			○	○			○	○	○		
800					○	○	○	●		○	○			○	○	○		
500						○	○	○	○	○	○	○	○	○	○	○	○	
400							○	○	○	○	○	○	○	○	○	○	○	○
300								○	○	○	○	○	○	○	○	○	○	○
250									○	○	○	○	○	○	○	○	○	○
200										○	○	○	○	○	○	○	○	○
100											○	○	○	○	○	○	○	○
60												○	○	○	○	○	○	○
30													○	○	○	○	○	○
Recording frames		782,073	195,373	83,337	48,832	20,832	13,332	8,136	4,881	8,331	7,810	3,331	3,084	10,415	5,206	4,164	2,081	1,218
Recording time(sec)		55.8	48.8	30.8	19.5	14.8	13.3	10.1	9.7	8.3	7.8	6.6	6.1	5.2	5.2	5.2	5.2	4.8

### Connection diagram

#### With tablet PC

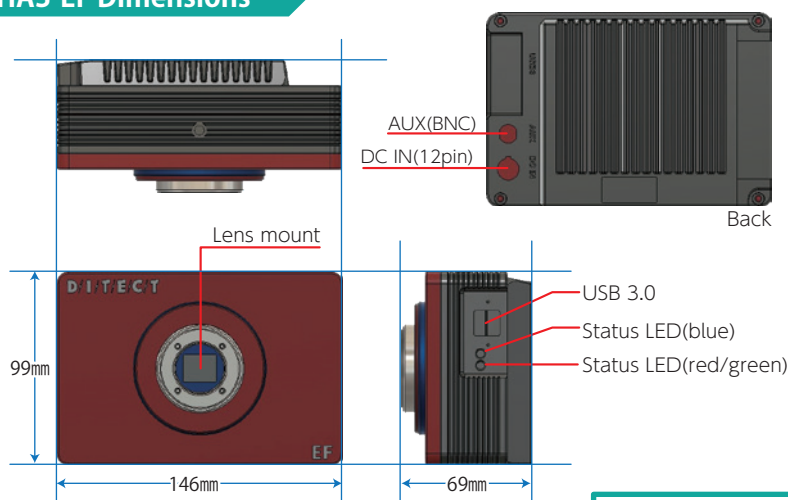


#### With multiple high speed cameras



\*AC and sync cables are not listed in the diagram. \*Hub and the cable between hub and PC are optional.

### HAS-EF Dimensions



\*Specifications and external appearance may be subject to change without notice.

### Specifications

Camera	
Camera type	Mono (HAS-EFM) Color (HAS-EFC)
Sensor type	CMOS
A/D	12 bit
Effective resolution	2,560 × 2,048 (5.2 M pixel)
Sensor format	1-inch
Lens mount	C
Recording mode	Embedded memory
Memory size	6 GB
Data output interface	USB 3.0 (Type B)
Shutter (exposure)	Minimum 1/1000,000 (100 μ )
Sensitivity	6 V / lux.s
Power input	12pin DC12V
Electric requirement	12 W
Control software	
Trigger mode	Start / End / Variable (3.3 V TTL or contact signal) and motion trigger
Aux function	Histogram, Guide line, Focus peeking, Live image rotation, Time stamp, Trimming, Text
Image format	AVI, WMV, MP4, BMP, JPEG, PNG
Supported OS	Windows10, 11
Included items	USB 3.0 cable, AC adapter, control software



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Digital Image Technology

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