



MS-500 Ultra-High-Sensitivity Camera

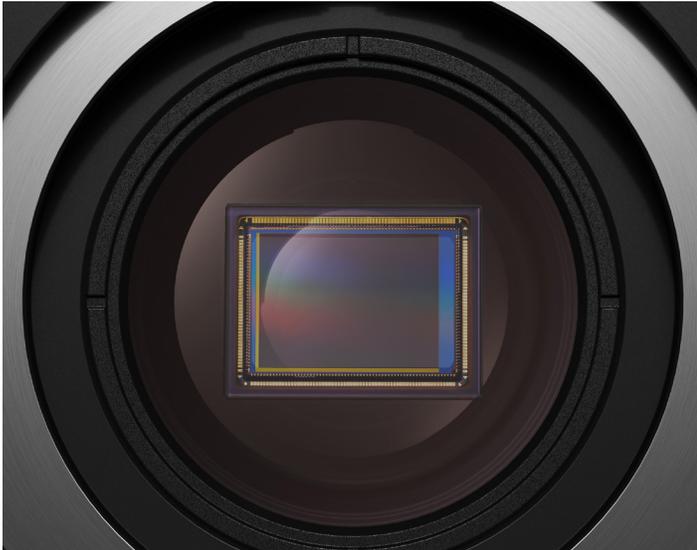
The first advanced long-range, low-light camera from Canon, developed for viewing remote objects at a distance of several miles, in color – day or night. Equipped with the ultra-high-sensitivity Single-Photon Avalanche Diode (SPAD) sensor and the B4 mount that can support Canon broadcast lenses.

SPECIFICATIONS

IMAGE SENSOR		MS-500	
Sensor	1" SPAD Sensor		
Total Pixels	3.2M		
Effective Pixels	2.1M		
Maximum Resolution	1920x1080		
Minimal Subject Illumination	.001 lux (Color (Night Mode), no light accumulation, f/1.4 equivalent, shutter speed 1/30, 50IRE, maximum gain 84dB, Custom Picture [Crisplmg2])		
LENS SYSTEM			
Lens Mount	Bayonet lens mount based on BTA S-1005B standards		
TERMINALS			
LAN Terminal	RJ-45 for IP Video Streaming and Control		
Output Format	3G/HD-SDI (4:2:2 10-bit)		
Remote Camera Control	NU Protocol (Canon proprietary, Serial), Pelco-D (RS-232C/RS-422/RS-485)		
Lens Terminal	Circular 12-pin Jack x1		
GenLock Terminal	BNC jack (input only) x 1, 1.0 Vp-p/75		
3G/HD-SDI Terminal	BNC jack (output only) x 1, 0.8 Vp-p/75, unbalanced 3G-SDI: SMPTE 424, SMPTE 425, SMPTE ST 299-2 HD-SDI: SMPTE 292, SMPTE ST 299-1 Time code (VITC/LTC)		
IMAGE CONTROL			
Focus Control	Manual, One-shot AF AF frame: Large, small AF frame position: Center, specified area		
Resolution/Frame Rate	Frame Frequency 59.94P: • 1920 x 1080: 59.94P, 59.94i (4:2:2 10 bit) • 1280 x 720: 59.94P** (4:2:2 10-bit) Frame Frequency 29.97P: • 1920 x 1080: 29.97P, 29.97PsF (4:2:2 10-bit) Frame Frequency 50.00P: • 1920 x 1080: 50.00P**, 50.00i (4:2:2 10-bit) • 1280 x 720: 50.00P (4:2:2 10 bit) <small>**3G-SDI mapping Level A/B supported</small> Frame Frequency 25.00P: • 1920 x 1080: 25.00P, 25.00PsF (4:2:2 10-bit)		
Shutter Speed	1/4000s to 1/4s [59.94P], 1/4000s to 1/4s [29.97P], 1/4000s to 1/3s [50.00P], 1/4000s to 1/3s [25.00P]		
Filter	ND filter: motor operated insertion-extraction (manual/automatic), 1 density level (approx. 1/64) IR cut filter: motor operated insertion-extraction (manual/automatic)		
IMAGE CONTROL		MS-500	
Exposure	Auto, Tv, Av, AGC Upper/Lower Limit, Manual, AE Shift		
Metering Mode	Standard, Spotlight, Backlight, AF Frame Monitoring		
Gain	0.0-84.0 dB (ACG Upper/Lower Limit Available)		
Custom Picture	Crisplmg2, BT.709 Standard, Canon 709		
Smart Shade Control (SSC)	Available		
Haze Compensation	Available		
DIFFRACTION CORRECTION			
Chromatic Aberration Correction	Available (excluding certain non-supported lenses)		
Digital Zoom	Available 10x (Max.)		
IP VIDEO OUTPUT AND CONTROL			
Video Compression	JPEG, MPEG-4 AVC/H.264, H.265/HEVC		
Video Size	1920 x 1080, 1280 x 720, 640 x 360, 320 x 180		
Video Output Frame Rate	JPEG: 0.1 – 15 fps MPEG-4 AVC/H.264, H.265/HEVC Frame Frequency 59.94P/29.97P: 0.99/4.99/9.99/14.98/29.97/59.94 fps Frame Frequency 50.00P/25.00P: 1/5/12.5/25/50 fps		
Network Protocol	IPv4, IPv6, TCP/IP, UDP, HTTP, SNMPv1/v2c/v3 (MIB2), RTP/RTCP, RTSP, DHCP, AutoIP, DNS, mDNS, ARP, ICMP, NTP, SSL/TLS		
Control Protocol	NU (Canon proprietary, Serial), Pelco-D (Serial), ONVIF, WV-HTTP (Canon proprietary), WVCOM (Canon proprietary)		
POWER INPUT			
External Power Input	External power source: 12 – 30 V DC (connector included)		
Power Consumption	DC input: Max. 23.7 W (camera body only)		
OTHER			
Temperature	Operating temperature range: -20°C – +45°C (-4°F – +113°F) Start-up temperature range: -10°C – +45°C (+14°F – +113°F)		
Dimensions	Approx. 128 x 128 x 184 mm (5.04 x 5.04 x 7.24 in.) (excluding protrusions)		
Weight	Approx. 2.2 kg (4.86 lb.) (camera body only)		
Included In Box	MS-500 Camera, Power Supply Connector, Warranty Card		

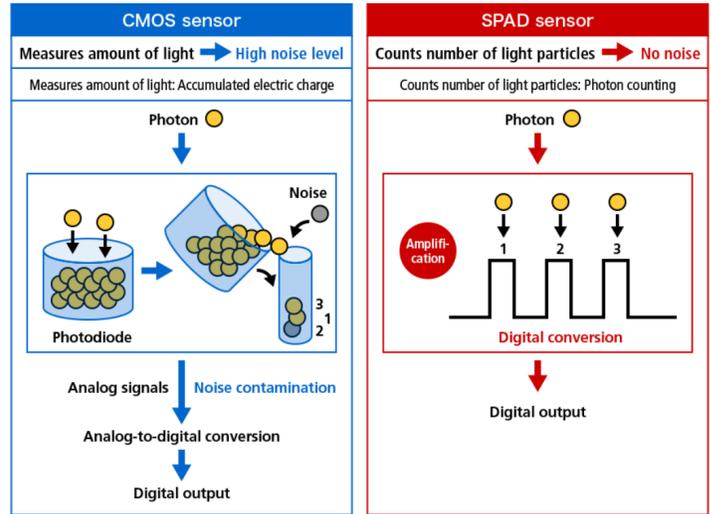
*Additional specifications for MS-500 camera and SPAD sensor available under NDA.

Single Photon Avalanche Diode



Innovative Ultra-High-Sensitivity SPAD Sensor

The MS-500 camera's SPAD sensor captures the brightness of a subject by digitally counting each incoming light particle (photon) through a method called photon counting, which is completely different from the conventional CMOS sensor.



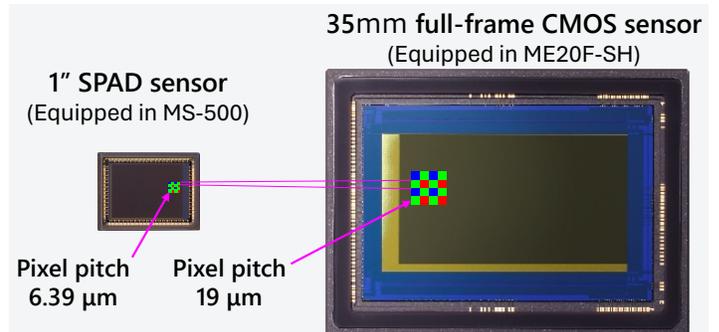
CMOS Sensor vs SPAD Sensor

Unlike conventional CMOS sensors, when even one photon reaches a pixel and generates an electron the SPAD sensor instantaneously¹ multiplies the electron by approximately 1 million times via the electron avalanche effect² and outputs it as an electrical pulse signal – which ultimately allows the sensor to detect light more accurately with less noise.



Camera & Lens Control

The MS-500 camera is equipped with an Ethernet port that can be used to remotely control the camera, the lens and the pan-tilt head control using NU, Pelco-D or ONVIF protocols and access its video output over IP. Serial communication is also available. Remote operation allows for more subtle manipulations and fine adjustments when shooting at a long distance with an ultra-telephoto lens with a very narrow angle of view, rather than operating directly with a camera button or lens ring.



Ideal for Low-light, Long-range Shooting

The SPAD sensor features approximately 3.2 million pixels, the highest in the world³. With this large pixel number achieved by minimizing pixel pitches to approximately 6.39 µm, the MS-500 can capture Full HD high-resolution color images with a small sensor.



Broadcast Lens B4 Mount & Built-in Magnifying Optical System

Featuring Broadcast Industry standard B4 mount, the SPAD sensor is able to take advantage of Canon's extensive lineup of broadcast lenses. Since most broadcast lens optics are designed for 2/3" sensors, the camera has a built-in magnifying optical system⁴ that matches the built-in 1-inch sensor, allowing the lens to be attached directly to the camera mount for shooting without cropping the sensor pixels.

¹Minimal time of 100 picoseconds or less (1 picosecond = 1/1 trillionth of a second).

²The effect of generating a large number of electrons explosively in a very short time from one electron generated by a photon is called the Electron Avalanche Effect.

³Among cameras equipped with SPAD sensors used for color video shooting. As of July 31, 2023. Based on Canon research.

⁴The built-in magnifying optical system of the MS-500 has a magnification of about 1.3x.

