Space Eye SE 320

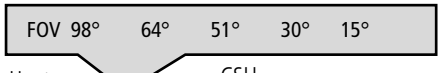
For Use on Research Rockets, Launch Vehicles or Carrier Rockets and Satellites

The Kappa Space Eye is being used by the NASA Sounding Rocket Program (NSRP) in space environments. Extreme robustness and thermal management qualify this SWaP-optimized system for space environments and vacuum conditions. High-quality streams are transmitted via existing telemetry hardware directly from the camera to the ground station in selectable bandwidth. The main benefits are Gigabit Ethernet, H.264 compression, Full HD1080p, Frame Rate between 5 fps and 180 fps and low latency.

Components SE 320	CSU (Camera Sensor Unit), CEU (Camera Electronic Unit) CPE (Camera Power Extension, optional), active wire (optional) heater (optional)
Sensor	**Exchangeable heads | CSU**
Sensor	IMX252 (Sony)
Type	CMOS
Shutter	global
Color	RGB
Optical format	1/1.8"
Number of pixels (H xV)	2048 x 1536 pixels
Pixel size (H x V)	3.45 µm x 3.45 µm
Image size (H x V)	Full HD1080p: 6.62 mm x 3.73 mm; diagonal 7.6 mm (1/2.35")
Interface	
Data interface	Gigabit Ethernet (GigEVision 2.0)
Control interface	GenICam, XML File
Memory	internal SD-Card for loop recording
Video stream	RTP/RTSP unicast/multicast, GVSP unicast/multicast
Trigger	external hardware trigger, software trigger
Compression	H.264, 1-16 Mbit/s, dual compression, High Profile (Level 5)
Time synchronization	PTPv2 (IEEE1588)
Image resolution	up to 1920 x 1080 pixels (Full HD1080p)
Frame rate	adjustable from 5 fps to 180 fps depending on resolution and imager type up to 1080p60/ 720p100/ 360p180
Latency	Approx. 80 ms between sensor and camera output @ 1080p60
Software	SDK X, KCC X, IP Configurator, Software Update tool

Function

Exposure	manual/ automatic, up to 1/frame rate
Gain	manual/ automatic, 0 dB to 24 dB (analog gain, sensor specific)
Corrections	hot pixel correction
Color processing	white balance (optimized for 5600 K), color saturation adjustment
Gamma	0.45/ linear
Diagnostics	built-in tests during power-up and operation
Overlay	Time, crosshair, user-adjustable text, date time

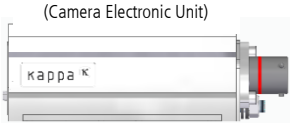


Heater (optional)

CSU Camera Sensor Unit)

Active Wire (optional)

CEU (Camera Electronic Unit)



CPE (optional, Camera Power Extension)

We are constantly checking the accuracy of the technical data.
We are prepared to provide more detailed information on request.
Technical data are subject to change without notice!

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General data

Housing version	Compact version (direct connection), remote head version (remote distance up to 10m)
CEU, dimension, weight	58,5 mm x 39,5 mm x 116 mm (including connectors), appr. 380g
CSU, dimension, weight	50 mm x 39 mm x 52,5 mm; (including lens protection) @ 51°HFOV (without heater), appr. 170 g
Cable for remote heads	1 m, 3 m, 5 m and 10 m active wire cable available (option)
Power supply, weight	9-36V DC (compact & remote head version), option: 9-60 V DC (with CPE, power interruption 100ms), appr. 250g
Heater (optional)	De-icing, 28 V DC
Connectors	Power receptacle: Souriau part number 8STA20235PN - Recommended mating connector: Souriau part number 8STA60235SN; GigE receptacle: Souriau part number 8STA21035PN - Recommended mating connector: Souriau part number 8STA61035SN
FoV, field of view	FoV 15° (F/2), 30° (F/2,8), 51° (F/2,4), 64° (F/2,5), 98° (F/1,8)
Lens mount	S-mount
Filter	IR-cut filter / B270 protected lens cover
Operating temperature	DO-160G, Section 4, Category E1. Operating Low -55°C, Operating High +70°C Short Time Low -55°C(1h), Short Time High +70°C(1h)
Operating temperature in vacuum	Cycles between +61°C ±3° and -24°C ±3° at 10^{-4} [Torr] with 3 hours dwell time at each temperature extreme
Humidity	DO-160G, Section 6, Category B, 10 cycles
Shock	60g square wave (half sine) – 6ms for each axis
Sinusoidal vibration	for each axis (Sweep Rate: 4 oct. / min) with 7.30 in/s = 5-89 Hz, 10.5g = 89-800 Hz, 15.0g = 800-2000 Hz
Standard random vibration	for each axis with duration of 20 sec in each axis); 0.115 g^2/Hz @ 20 Hz to 0.225 g^2/Hz @ 1000 Hz (on 0.52 dB/octave slope); 0.225 g^2/Hz from 1000 Hz to 2000 Hz
Acceleration	Sustained acceleration of 60g in each of the three primary axes for at least one minute.
Storage	DO-160G, Section 4, Category E1, Ground Survival Low -55°, Ground Survival High +85°
Salt Fog	DO-160G, Section 14, Category T
Altitude	DO-160G, Section 4, Category E2
Waterproofness	DO-160G, Section 10, Category S, optional 28 V de-icing system
Compliance	ROHS/ MIL-STD
EMC resistance (based on compact version with CPE)	Radiated emission of radio frequency energy (RE) — DO-160G, § 21 Category H Conducted emission of radio frequency energy (CE) — DO-160G § 21, Category H Conducted susceptibility, cables and power leads (CS) — DO-160G § 20, Category R Radiated susceptibility, electric fields — DO-160G, § 20, Category R Conducted susceptibility audio frequency — DO-160G, § 18, Category B Power +28V DC systems — DO-160G § 16, Category A DC 28 Power Voltage spikes — DO-160G § 17, Category B Lightning direct effects — DO-160G § 23 Lightning indirect effects — DO-160G § 22 ESD — DO-160G § 25 CAT A
Acceptability (for electronic assemblies)	IPC-A610 Class 3

Electrical characteristics	CSU + CEU	CSU + CEU + CPE	CSU + Active Wire + CEU	CSU + Active Wire + CEU + CPE	Heater (**additional consumption)
Power Consumption	6.5 W	7.0 W	7.5 W	8.7 W	+6.5 W **
Nominal current at 28V	230 mA	250 mA	270 mA	310 mA	+230 mA **
Max current at Power up	1,5 A	1,5 A	1,6 A	1,6 A	1,75 A
Peak Current	1,5 A	1,5 A	1,6 A	1,6 A	1,75 A

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