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QSI RS .40

QSI RS 0.4 0.4MP COOLED CCD CAMERA

The QSI RS 0.4 model camera employs a 0.4mp Kodak full-frame CCD image sensor with microlens technology. With high quantum efficiency, wide dynamic range, dual read rates, and internal 5 or 8-position color filter wheels the QSI RS 0.4 is ideally suited to a broad range of demanding scientific, medical, astronomical, and industrial imaging applications.

The compact design of the QSI RS Series allows the RS 0.4 to set a new benchmark for cost and size in a high performance, full-featured scientific CCD camera. With optional features and upgradeability, the QSI RS 0.4 can be tailored to fit your needs today and in the future.

The RS 0.4 camera system is supported by industry leading image acquisition software plus a full camera control API is available for creating custom Windows or Linux applications.

See all camera specifications (<https://qsimaging.com/specification-tables/>)

€POA

Choose an option

High Performance CCD Image Sensor

Leading Edge Technical Performance

Refined Design

Efficient, Low Power CCD Sensor Cooling

Compact Shutter and Filter Wheel

Connectivity and Notification

Extensive Software Support

0.4 Megapixel CCD Image Sensor


The standard RS 0.4 model camera employs a Kodak KAF-0402ME 0.4 megapixel Enhanced Response full-frame CCD image sensor with microlens technology. The KAF-0402ME sensor has a photoactive array of 1536W x 1024H pixels. It has excellent quantum efficiency between 350nm and 1000nm with significant enhancement at the blue end of the spectrum. Peak QE approaches 80%. Low dark current and high pixel charge capacity result in a dynamic range exceeding 76db.

The sensor employs a true two-phase charge transfer technology with a transparent gate that significantly increases optical response compared to traditional front illuminated full frame sensors. Micro lenses cover the surface of the CCD to focus the light through the transparent gate to further increase optical response. See the Specifications tab for more detail.

An alternate CCD configuration is optionally available. The KAF-0402E image sensor does not include micro lenses but is otherwise identical to the standard image sensor. The chart above illustrates the difference in quantum efficiency between these CCD imager sensors. The KAF-0401LE is no longer available.

Model RS 0.4 CCD Image Sensor Specifications

Feature	Standard	Optional
CCD Manufacturer & Model	Kodak KAF-0402ME	Kodak KAF-0402E
CCD Architecture	Full Frame	Full Frame
Blue Enhanced	Yes	Yes
Microlens	Yes	No
Anti-blooming	No	No
Imager Size: (WxH)	6.91mm x 4.6mm	6.91mm x 4.6mm
Pixel Array (WxH):	784×520 total pixels, 768×512 active (visible)	784×520 total pixels, 768×512 active (visible))
Pixel Size:	9μm x 9μm	9μm x 9μm
	Typical Values	
Pixel Full Well Depth	100,000 electrons	100,000 electrons
Absolute Quantum Efficiency	Peak: 77% 400nm: 45%	Peak: 65% 400nm: 30%

Pixel Dark Current	<1.0 electron per second at 0°C <0.1 electron per second at -25°C	
Dark Current Doubling	6.3° C	6.3° C
Intrinsic Read Noise	15 electrons RMS	15 electrons RMS
Dynamic Range	76db	76db
Charge Transfer Efficiency	>0.99999	>0.99999
 _ (http://www.adobe.com/products/acrobat/readstep2.html)	Manufacturer's CCD Imager Specifications	
	KAF-0402E/ME (PDF) (https://qsimaging.com/docs/KAF-0402_Datasheet.pdf)	

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Model RS 0.4 Camera Specifications

Feature	Model RS 0.4s		Model RS 0.4ws(-8)	
CCD Image Sensor	KAF-0402ME			
Electronic Shutter	Mechanical, exposure range: 0.03 seconds to 240 minutes			
Mechanical Shutter	Yes		Yes	
Internal Color Filter Wheel	No		ws – 5-Position CFW ws-8 – 8-position CFW Holds 1.25" or opt. 31mm filters	
Camera Body Configuration	Medium Enclosure			Full Enclosure
Dimensions	W4.45" x H4.45" x D2.00" (add 0.225" for T-Mount)		5-pos, W4.45" x H4.45" x D2.50" 8-pos, W5.86" x H5.56" x D2.50" (add 0.225" for T-Mount)	
Weight, without Nosepiece	34 oz. / 950g		5-pos, 40 oz. / 1130g 8-pos, 51 oz. / 1450g	
Optical Back Focus (w/o Filters in path)	0.90" w/ T-mount adapter 0.68" w/ C-mount adapter 0.68" w/ no adapter		1.40" w/ T-mount adapter 1.18" w/ C-mount adapter 1.18" w/ no adapter	
Thermoelectric CCD Cooling	Temperature regulation +/- 0.1°C, @ 0°C to -40°C CCD temperature			
In free air, Fans @ Full Speed	Typically 45°C below ambient air temperature with 85% cooling power			
With Opt Liquid Cooling – Fans Off	Typically 52°C below circulating liquid with 85% cooling power (adds 0.75" to camera depth)			

Cooling Fan Control	Intelligent, user configurable	
Read Rate	User Selectable High Quality mode at 800KHz, High Speed mode at 4MHz	
Camera Gain	2.6 electrons per ADU	
Digital Resolution	16 bits (both High Quality and High Speed mode)	
Total System Read Noise	Typically 15 electrons RMS (CCD specification limited) in High Quality mode Typically 25 electrons RMS (CCD specification limited) in High Speed mode	
Pixel Dark Current	<1.0 electron per second at 0°C <0.1 electron per second at -25°C	
Full Image Read and Download Time	Typically <0.5 second (host computer dependent) in High Quality Mode (800KHz) Typically ~0.1 second (host computer dependent) in High Speed Mode (8MHz) Image download times will be reduced with binning and/or subframe (ROI)	
Binning Modes	Symmetrical and Asymmetrical binning up to 9 pixels horizontally or vertically	
Status and Notification	User configurable multi-color LED status indicator and multifunction audible beeper. Over-temperature and high/low voltage alarms.	
Power Consumption	12v, 2A (24 watts) at max cooling, max fans and filter moving (25 watts max with included 90-240V AC power supply)	
Operating Environment	Temperature: -20°C to 30°C, Humidity: 10% to 90% non-condensing	
Computer Connectivity	USB 2.0 High Speed (USB 1.1 compatible)	
Other Ports	Optically isolated 4 channel control port for telescope guiding or input/output shutter trigger (<i>See API Reference Manual for details</i>)	
Lens Attachment	Standard – T-Thread, 42mm x .75mm pitch Supports Canon EOS and Nikon F-mount lenses	
C Mounting Adapter (1" x 32TPI)	Optional, C-Mount (Type II) lens focus compatible (17.5mm backfocus)	Optional, for non-lens adapters and accessories (standard C-Mount lens does not reach focus at infinity)
Nosepiece	Standard, T-Adapter to 2" nosepiece Optional, T-Adapter to 1.25" nosepiece	

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