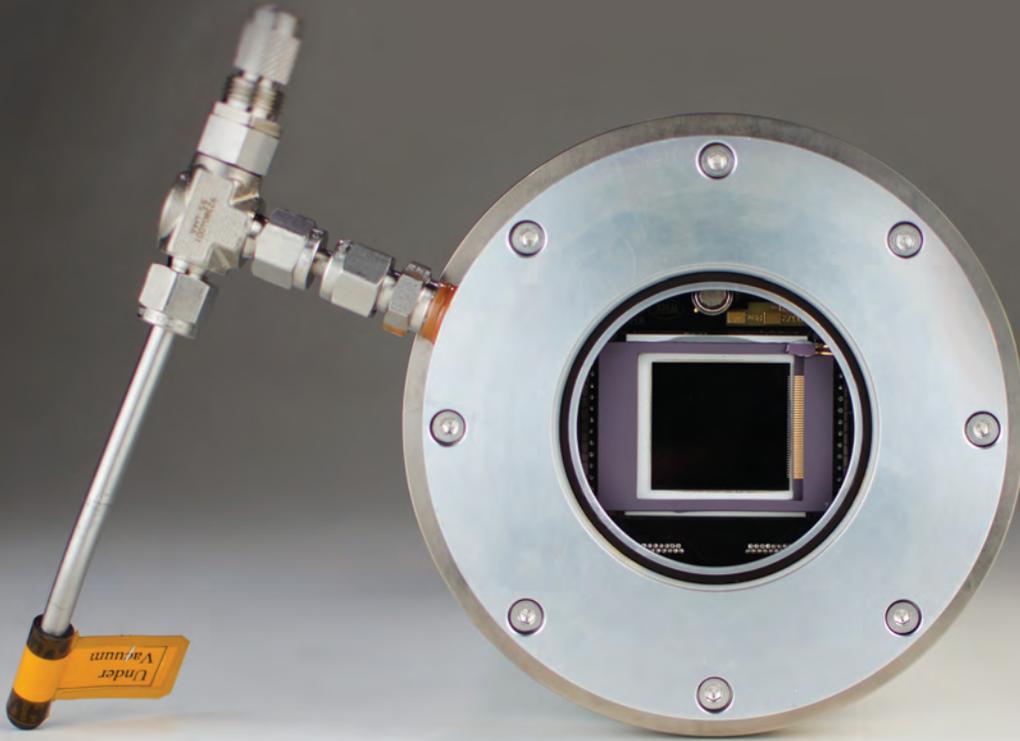


**1900S**  
*Flexible* CCD Camera Platform

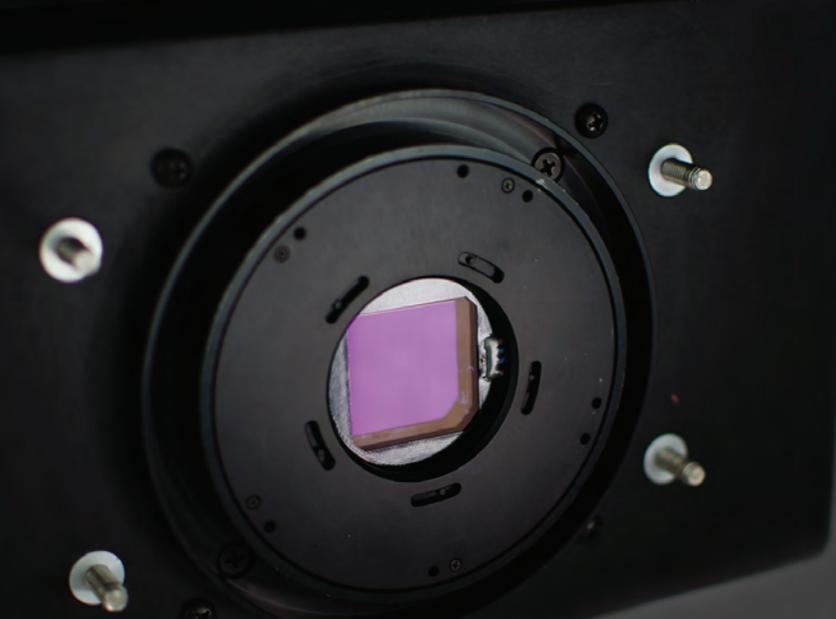


## Uncompromising Performance

After nearly 30 years of industry leading innovation the I900S TEC camera platform continues to raise the bar. Spectral Instruments keystone is understanding our customers application to provide a camera system best suited for their needs. To save our customers development time & money - we build camera “platforms” that can be readily configured in ways that best align with their intended use. The I900S is our latest platform that integrates core technology to be configured with a variety of different scientific CCDs operated in different configurations. This versatile platform can image X-Ray - NIR, with best-in-class low read noise, & achieves dark current levels previously seen only in sub -100°C cooled cryo cameras.

### Features

- **Ethernet Interface** requires no plug-in interface card & driver
- **Sealed Vacuum** no vacuum service required in many configurations
- **Thermoelectric Sensor Cooling** regulated -35°C to -90°C using multistage TEC under real-world conditions
- **Liquid or Air Camera Cooling** including air cooled camera with -90°C Absolute regulated CCD temperature
- **Multi-Port Readout** one, two or four ports with 16 bit digitization
- **Multiple Readout Speeds** 100 kHz to 3 MHz per port using modern 100 MHz ADCs
- **Variety of CCDs Available** front & back illuminated, AR coated & uncoated, up to 4k x 4k, standard & thick epi, full frame & frame transfer
- **Window Options** AR coated optical windows, windowless, Beryllium X-ray windows, fiber optic faceplates & tapers
- **Shutter & Driver** optional shutter & internal shutter driver available
- **Software Interface** GigE Vision® compliant. Windows & Linux SDKs. SI Image for control, acquisition, image calibration & correction & archiving
- **Enclosure Options** standard laboratory, environmentally sealed, vacuum “bubble”, low cost OEM
- **Ideal for Low Light Applications** professional astronomy, bioluminescence, chemiluminescence
- **Excellent for X-Ray Imaging & Spectroscopy** direct or indirect X-ray detection



## Unequaled Versatility

### OEM

The robust & flexible I900S is the ideal platform to suit your OEM requirements. Supporting a variety of CCDs with air & liquid cooling options ( $-35^{\circ}\text{C}$  to  $-90^{\circ}\text{C}$  absolute) the I900S can easily be custom designed for your specific project – saving both development time & costs.

Spectral Instruments has a well-established history of producing OEM cameras at any volume. With over 3,000 square feet of clean room space (Class 1000/Class 100) & a 40,000 square foot manufacturing facility, Spectral Instruments has the expansive capability & resources to quickly design, manufacture & produce cameras specifically engineered for your application.

Our internal engineering capabilities are unmatched for cost & effective design of cameras which surpass the mechanical, electrical, & performance specifications required for high-end OEM scientific imaging & measurement systems. Best of all, our ongoing support exceeds industry standards throughout the product life cycle.

### Vacuum

Spectral Instruments was the first commercial CCD camera manufacturer to offer high performance, cooled CCD cameras that could be operated in challenging vacuum environments.

With extensive experience in beryllium & custom AR windows, fiber optic faceplates, & custom front flanges, Spectral Instruments is the established industry leader in supplying in vacuum & vacuum facing imaging systems.



# Adaptable Across Applications

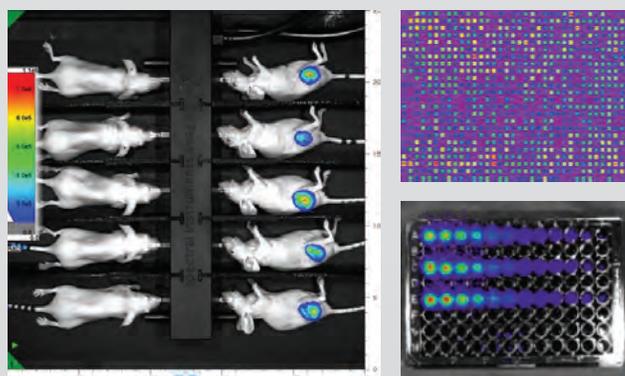
## Astronomy

The 1900S platform can use up to a 4k x 4k, 4 port CCD & is well suited for imaging astronomical targets on medium to large telescopes. The performance of a cryocooled CCD allows the TEC cooled 1900S to be very useful for astronomers conducting direct imaging.



## Life Science

Drug discovery frequently utilizes Chemiluminescence to indicate the interaction of compounds with specific targets relevant to the object of study. This signal is frequently very faint, & in some cases is emitted from inside an animal. The 1900S has the ability to bin to high levels without sacrificing the low read noise capability & allows for extremely faint signals to be detected & quantified.



## 1900S Platform Measured Performance

Measured Values	Standard	Air Cooled, OEM		Small Footprint	Vacuum Facing, Beryllium Option		Small Footprint
Resolution	2K x 2K	770 x 1152	2K x 2K	2K x 2K	1K x 1K	4K x 4K	2K x 2K
Readout Speeds	100kHz, 800kHz, 1.2 MHz	100kHz, 800kHz	100kHz, 800kHz	100kHz, 1.1 MHz	1.0 MHz, 1.5 MHz	500kHz, 1.4 MHz	500kHz, 1.7 MHz
Outputs	1	1	1	2	1	4	1
Read Noise (e-)	<3, 6, 10	<3,6	<3,6	3, 8	7, 10	6, 20	5, 13
Cooling/TEC	-90°C Liquid Cooled	-90°C Air Cooled	-90°C Air Cooled	-60°C Liquid Cooled	-40°C Liquid Cooled	-40°C Liquid Cooled	-40°C Liquid Cooled
Dark Current (e-/pixel/sec)	0.0003	0.0009	0.0009	0.003	20	15	6
Pixel Size (µm <sup>2</sup> )	13.5	22.5	13.5	13.5	13	15	13.5
Image Area (mm)	27.6 x 27.6	17.3 x 25.9	27.6 x 27.6	27.6 x 27.6	13.3 x 13.3	61.4 x 61.7	27.6 x 27.6
Full Well Capacity (Ke-)	100 (RIMD)	N/A (limited by configuration)		100 (RIMD)	145 (NIMO, DD)	300 (NIMO, DD)	150 (NIMO, DD)
Applications	Life Sciences, Astronomy	Life Sciences, Electronic Component Inspection	Life Sciences, Electronic Component Inspection	Astronomy	High Energy Physics, Direct X-ray	High Energy Physics, Direct X-ray	Direct X-ray, Vacuum compatible
Optimized For:	Low light, long exposures			Readout speed, Environmentally Sealed	Dynamic Range & Readout speed		

Spectral Instruments customizes each camera's performance for the intended application. The 1900S supports a variety of custom & commercially available CCDs.