

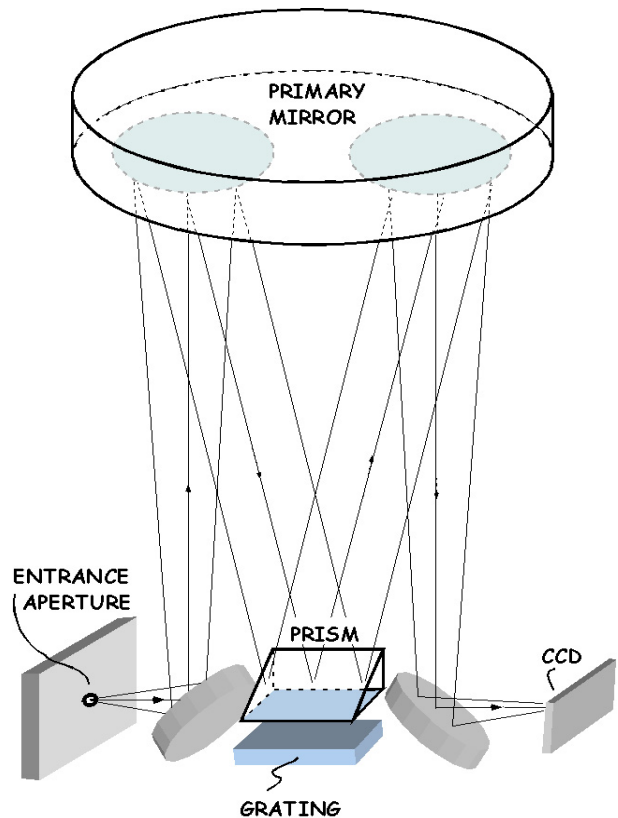
The SE 200 represents a new approach to spectrograph design that is exclusively for use with CCD imaging arrays. Scanning a grating to reach a wavelength range is now a thing of the past. The SE 200 achieves high spectral resolution over the entire wavelength range of the CCD with *no moving parts*. The system is ideal for both general spectroscopy applications and Laser Induced Breakdown Spectroscopy.

Multiple orders of diffraction from the echelette grating are separated by a cross-dispersing prism before they are imaged onto the CCD. The detector chip effectively becomes an array of many thousands of pixels, which sample wavelengths in a range up to 190-1100 nm. The SE 200 monitors the entire spectrum continually. Spectra are recorded with maximum accuracy, even when the light source or sample changes over time.

The SE 200 is manufactured by Optomechanics Research Inc. under U.S. Patent 6,628,383. The software is written by Rhea Corp. and Catalina Scientific Instruments, LLC.

SE 200 Echelle Spectrograph Compact and Versatile

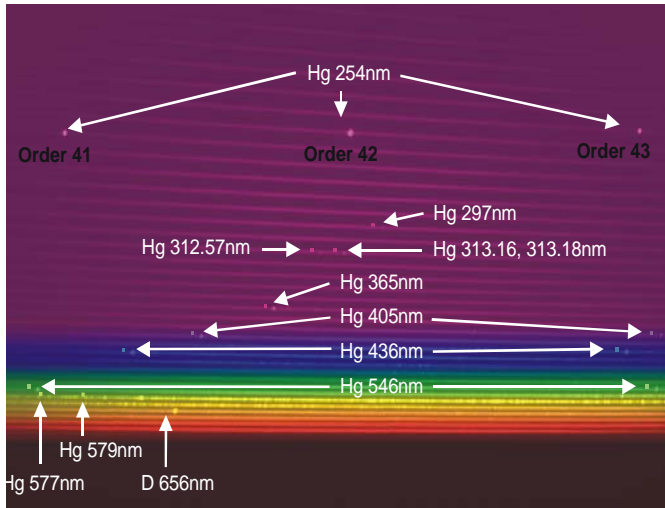
- Very efficient, compact and adaptable
- Can be used with a variety of CCD, EMCCD and ICCD cameras
- No mechanical scanning - get the entire spectrum in one exposure
- Covers the entire range of the CCD detector (UV-VIS-NIR) and acquires completely linearized spectra in units of wavelength or Raman cm^{-1} shift
- A variety of interchangeable dispersion modules and entrance slits are adaptable to many user applications.
- Optional shutter at entrance aperture



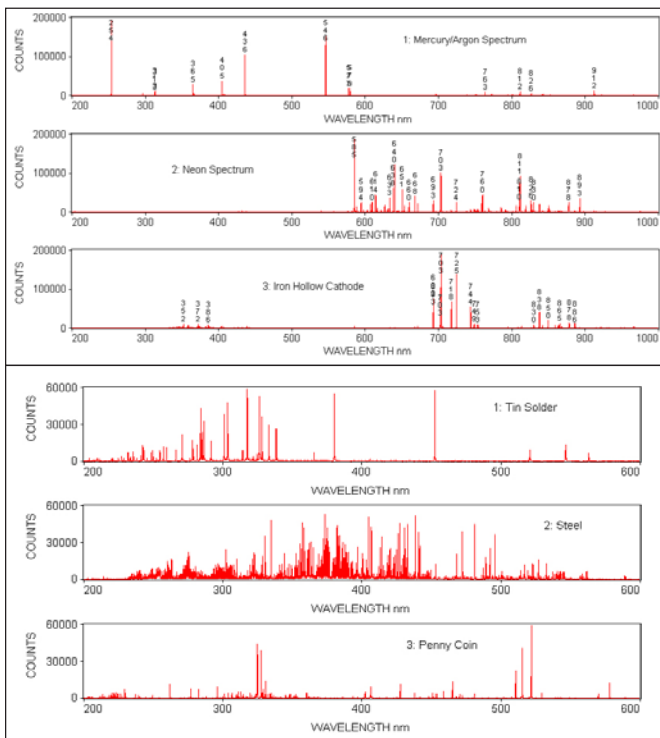
SE 200 optical layout

KestrelSpec™ Software

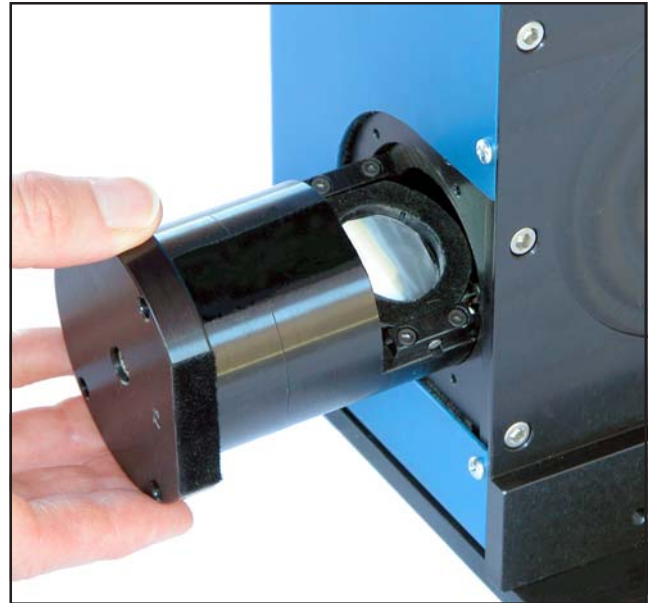
The SE 200 system is controlled by industry-standard KestrelSpec software, with complete real-time camera control and spectral acquisition. Our unique "2-point calibration" is performed in seconds with high accuracy. Spectral diffraction orders are automatically linked, linearized and plotted as data is acquired. Image and spectral data can be easily exported as ASCII files. An Element Identification tool with a user-editable reference library can identify the elements in atomic emission spectra for applications such as LIBS.



Deuterium, Tungsten and Mercury Image



Linked and linearized spectra and LIBS sample spectra



Interchangeable SE 200 Dispersion Modules

SE 200 Specifications

- Three basic dispersion modules*
 - Standard: 190nm - 1100nm range; large order separation; $\lambda/\Delta\lambda$ is about 2600 with CCD alone and 1700 with intensified CCD
 - High Order: 190nm - 1100nm range; high resolution; $\lambda/\Delta\lambda$ is about 3100 with CCD alone and 2700 with intensified CCD
 - UV: 190nm - 600nm range with gaps above 600nm; $\lambda/\Delta\lambda$ is about 6400 with CCD alone and 5600 with intensified CCD

Several additional modules are available.

- Focal length: 200mm
- Dimensions: 5(w) x 6(d) x 12.5(h) inches
- Weight: 9 lbs. without camera
- Interchangeable entrance slits
- Optional shutter (fastest exp. of 5 msec)
- Fiber optic input accessory

*Values shown are typical. Resolving power ($\lambda/\Delta\lambda$) and wavelength coverage assumes a 13 x 13 mm CCD with 13 x 13 micron pixels and a 25 x 25 micron slit. $\Delta\lambda$ is the FWHM peak width in nm and λ is the wavelength.

Computer System Requirements

- Windows™ 98/Me/2000/XP
- Appropriate digital interface for CCD

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