Entwicklungsbüro

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Spectrometry

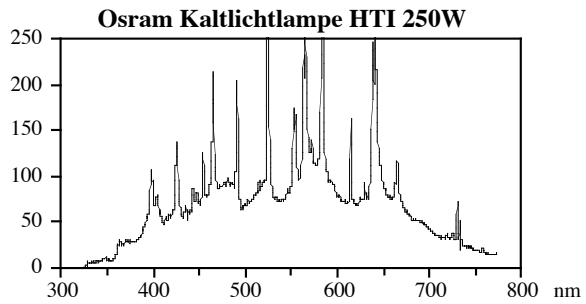
In principle our cameras runs with all kinds of spectrometer, but it should be considered that the spectra must be focused on a straight line. The focal line of a standard monochromator is a curve. Therefore a measured spectra will be defocused on the sensor surface. The offered spectrographs have a special flat field correction for use with linear sensors (i: imaging type). We offer complete systems with camera. The camera can be unmounted and used separately in all systems of us.

For low cost spectroscopic applications we recommend the LC camera with the ILX511 sony sensor. Anyway the best choice for spectroscopy are the Hamamatsu PDA's (Photo Diode Arrays) or FFT's (CCD-arrays, FFT: Full Frame Transfer) with especially large pixel sizes and increased sensitivity.

3 spectrometer with different gratings are ideal suited for our line scan cameras.

Spectrometer:

SR163 (Andor) f/3.6:	- fixed grating
	+ small dimension, low price
Acton 2156 (PI) f/4.0:	+ 2 grating turnable by computer
SpectraPro HRS 300	- high price
	+ 3 gratings turnable by computer



Example - spectra of a cold light lamp

The covered spectral range could be calculated by the reciprocal dispersion(**r. d.**).
Example:

The sensor S8381 has 1024 pixel with 25 μm pitch.
The length is L = 1024 * 25 = 25600 μm = 25.6 mm.
With grating 300 l/mm a region of r.D. * L = 19 * 25.6 = 486 nm is focused to the sensor. The absolute wavelength region depends on the position of the grating.
For example it can be adjusted to 300 - 786 nm. Turning the grating will increase the region to higher wavelength. The sensor has a resolution of 486 nm / 1024 = 0,5 nm.
Anyway the over all resolution is limited by the optical components and the slit width.

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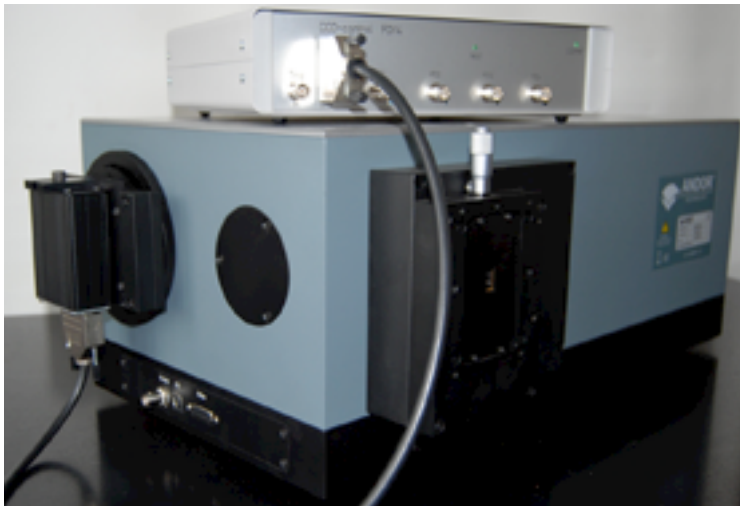
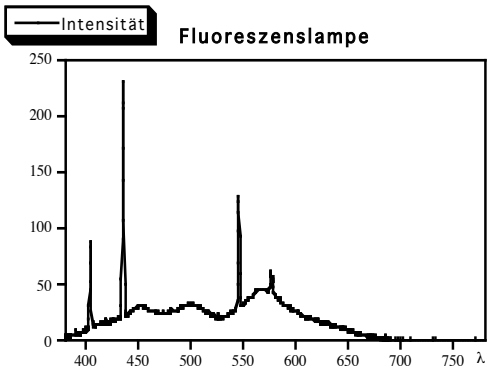
Inexpensive spectrometer with camera

Camera with SR163 and camera series 2000 (16bit)
grating with 150, 300, 600 or 1200 l/mm available

High resolution system



Camera with CamControl and sensor head with SR500.
The spectrometer is computer controlled.



Spectra of a fluorescent lamp

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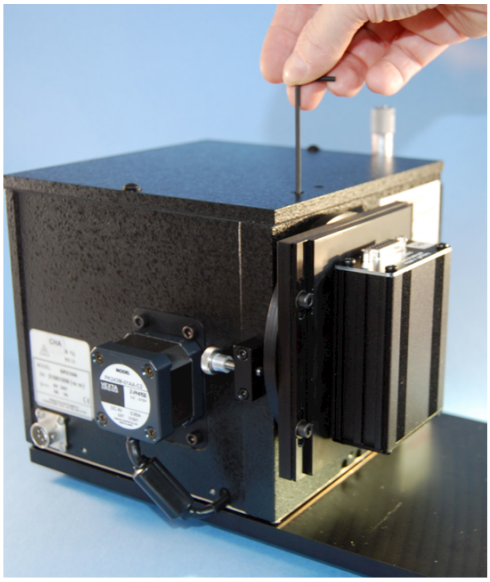
Computer controlled Spectrometer



here: Acton spectrometer 2156 with sensor head

simple, computer controlled spectrometer for single camera or sensor head

- cover wide wavelength region
- simple adjustable camera focus
- good price/value ratio
- adjustable input slit

Gratings for spectrometer 2156/2356/2556/2756 i (i : imaging type)

Gitter	150 l/mm	300 l/mm	600 l/mm	1200 l/mm
Sp 2156i	40 nm/mm 1000 nm	20 nm/mm 520 nm	9 nm/mm 250 nm	4 nm/mm 110 nm

r.d. in nm/mm (reciprocal dispersion),
covered range when using a sensor of 25 mm length.

Dimensions 2156i :	178 x 178 x 165 mm (long x wide x high)
Focal length / plane size :	150mm / 25mm x 10 mm (width x hight)
Effective aperture :	f / 4.0
Grating size :	32mm x 32mm

Gitter	150 l/mm	300 l/mm	600 l/mm	1200 l/mm
HRS300	21 nm/mm 540 nm	10 nm/mm 270 nm	5 nm/mm 130 nm	2 nm/mm 56 nm

other spectrometer and gratings on demand.

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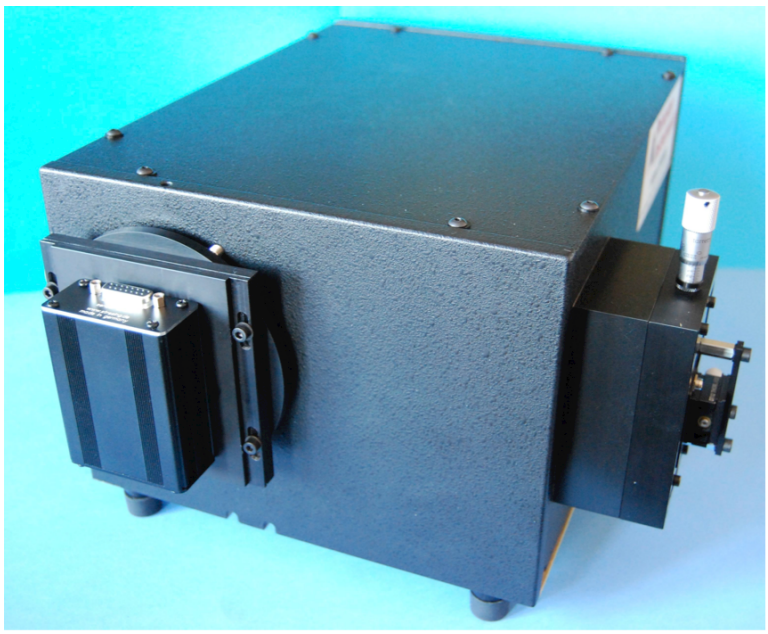
High resolution spectrometer



Shown here:
Acton 2356 with PDA double line sensor head and adjustable fiber input.

The bigger spectrometers have better resolution and can be used for our double line sensor head (2 sensors on one board). Here the build in output diaphragm must be removed.

Here you see a Teledyne HRS300 with 2 exits. One has a cooled IR- Camera Series 3001 (1000-2500nm).

The HRS300 has a turret with 3 gratings and a flip mirror at the exit - if it has 2. All functions are motorized and can be controlled with a computer. Here also a mechanical shutter at the input is shown.

Prices for spectrometer		**09/2023**	
SR 163 (Andor)	with flange (space for 1 grating)	€	4.900,-
	adjustable Slit	€	1350,-
	grating 150, 300, 600 or 1200 l/mm	€	700,-
SP 2156i (Acton)	with mount for camera (space for 2 gratings)	€	9.000,-
	grating 150, 300, 600 or 1200 l/mm	€	1.300,-

Other models on demand