

CAS 140CT-HR

High Resolution Array Spectroradiometer

Key features at a glance

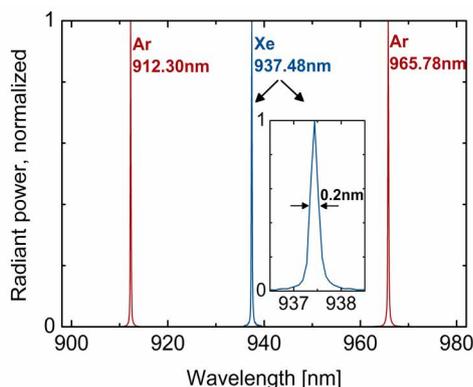
- ▲ High resolution down to 0.2 nm FWHM, 0.08 nm data point interval
- ▲ High-end CCD detector actively cooled to -10 °C
- ▲ Down to 9 ms integration time
- ▲ Integrated density filter wheel



The high resolution CAS 140CT-HR is based on Instrument Systems' well-proven high-end array spectroradiometer CAS 140CT. Particularly designed for the measurement of narrow band emitters, e.g. laser diodes, the CAS 140CT-HR combines high spectral resolution and short testing times for sophisticated production and laboratory applications.

\\ VERY HIGH SPECTRAL RESOLUTION

The CAS 140CT-HR models achieve very high spectral resolutions down to 0.2 nm (0.08 nm data point interval) for a spectral measuring range of 80 nm (see figure below). Measuring ranges of 120 and 160 nm result in spectral resolutions of 0.3 and 0.4 nm, respectively.



▲ Spectral radiant power of selected Ar and Xe emission lines. They were measured with a CAS 120-HR model with a spectral range of 902 to 982 nm and corresponding spectral resolution of 0.2 nm (FWHM).

\\ CUSTOMIZED WAVELENGTH RANGES

The CAS 140CT-HR offers a selection of different gratings with 1200, 1500 and 1800 lines/mm. Typical measuring ranges of 80, 120 and 160 nm are available in the spectral range from 800 to 1000 nm. Further spectral ranges in the VIS are available upon request.

\\ ACTIVELY COOLED CCD SENSOR

A back-thinned and back-illuminated CCD array sensor with 1024 x 128 pixels is used for detection in the CAS 140CT-HR. This sensor design in combination with hardware binning of the vertical pixels offers a high level of sensitivity and large dynamic range (30000 : 1). The active cooling to -10°C ensures highly stable operation and reproducibility. The CCD allows capturing the spectrum of an optical emitter in a single exposure. Additionally, short integration times from 9 ms make the CAS 140 CT-HR particularly suitable for the measurement of emitters with pulsed and continuous operation modes.

\\ TECHNICAL SPECIFICATIONS

CAS 140CT-HR High Resolution Array Spectroradiometer	
Spectral range ¹⁾	800 – 1000 nm
Detector	Back-thinned back-illuminated CCD actively cooled to -10°C
Number of pixels	1024 x 128
Gratings	1200, 1500, 1800 lines/mm
Measuring ranges (typical)	80 – 160 nm
Spectral resolution (typical)	0.2 – 0.4 nm
Data point interval (typical)	0.08 – 0.16 nm
Wavelength accuracy ²⁾	±0.05 nm
Integration time	9 ms – 65 s (PCIe); 10 ms – 65 s (USB)
Sensor dynamic range ³⁾	30000 : 1
Non-Linearity	±0.5%

\\ TECHNICAL SPECIFICATIONS

CAS 140CT-HR High Resolution Array Spectroradiometer	
Spectrograph	
Focal length, f number, grating type	Approx. 120 mm, f/3.5, plane reflection grating
Filter wheel	Available density filters: OD 0.5, 1, 1.5, 2, 2.5
Electrical data	
AD converter	15 bit resolution
PC interface	Standard: USB 2.0; optional: PCIe bus plug-in card ⁴⁾ in place of USB 2.0
Triggering	1 TTL input with ascending slope; 2 software-controlled TTL outputs; 1 TTL output with flash pulse
Baseline noise ⁵⁾	±60 counts, or ±0.4 %
Miscellaneous	
Dimensions (H, W, D)	192 mm x 330 mm x 348 mm
Power supply	Wide-range input 100 VAC to 240 VAC 50/60 Hz
Power consumption	Max. 50 VA
Ambient temperature	15 – 35 °C; relative humidity 70% max., non-condensing
Weight	Approx. 10 kg
Valid standards	In conformity with EN 61010-1:2002-08 (safety requirements governing electrical equipment for measurement, control and laboratory use)

\\ ORDERING INFORMATION ¹⁾

Order number		Product code options					
Product code		Central wavelength	Interface ⁴⁾	Slit	Filter wheel	Grating	
CAS140CT[Central wavelength][Interface][Slit][Filter wheel][Grating] e.g. CAS140CT0941U2K1		e.g. [0941] with grating [1]: 902-982 nm	[U] USB [P] PCIe	[2] 50 µm	[K] OD 1/1.5/2/2.5 [L] OD 0.5/1/1.5/2/2.5	[1] 1800 lines/mm [2] 1200 lines/mm [3] 1500 lines/mm	
Available models		Model product code					
Spectral range (typical)	Spectral resolution (typical)	Data point interval (typical)	Central wavelength	Interface ⁴⁾	Slit	Filter wheel	Grating
805 - 975 nm	0.4 nm	0.16 nm	[0888] 888 nm	[U] USB [P] PCIe	[2] 50 µm	[K] OD 1/1.5/2/2.5 [L] OD 0.5/1/1.5/2/2.5	[2] 1200 lines/mm
840 - 1006 nm	0.4 nm	0.16 nm	[0923] 923 nm				[2] 1200 lines/mm
902 - 982 nm	0.2 nm	0.08 nm	[0941] 941 nm				[1] 1800 lines/mm

¹⁾ Further spectral ranges upon request.

²⁾ Applies to Penray lamp or laser.

³⁾ For a single acquisition with 10 ms integration time.

⁴⁾ For option [P] an additional PCIe interface card and a 3 m cable with order number CAS140CT-403 is required.

⁵⁾ At shortest integration time, without averaging and at 30,000 counts signal level. When averaged, this value improves (e.g. averaged over 9 times equals a threefold noise reduction).

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