

CAS 140D-HR

High Resolution Array Spectroradiometer

Key features at a glance

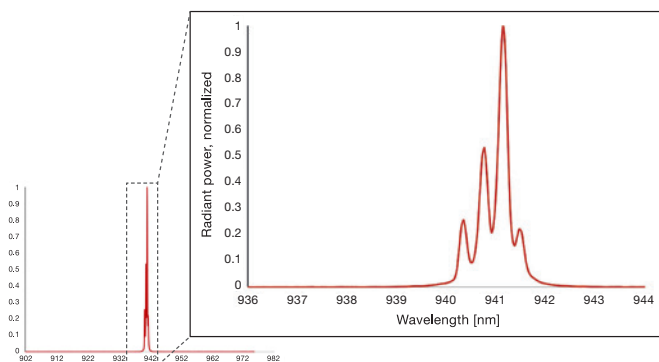
- ▲ High resolution down to 0.2 nm FWHM, 0.08 nm data point interval
- ▲ High-end CCD detector actively cooled to -10 °C
- ▲ Down to 4 ms integration time
- ▲ Integrated density filter wheel



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

\\ VERY HIGH SPECTRAL RESOLUTION

The CAS 140D-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 a 940 nm VCSEL. It was measured with a CAS 140D-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 140D-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 140D-HR. This sensor design in combination with hardware binning of the vertical pixels offers a high level of sensitivity and large dynamic range (37000 : 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 4 ms make the CAS 140D-HR particularly suitable for the measurement of emitters with pulsed and continuous operation modes.

\\ TECHNICAL SPECIFICATIONS

CAS 140D-HR High Resolution Array Spectroradiometer	
Model / Central wavelength	941 nm
Spectral range ¹⁾	902 – 982 nm
Detector	Back-thinned back-illuminated CCD, actively cooled to -10 °C
Number of pixels (vertically binned)	1024 x 128
Spectral resolution	0.2 nm
Datapoint interval	0.08 nm
Wavelength accuracy ²⁾	±0.05 nm
Integration time	4 ms – 65 s (USB)
Sensor dynamic range ³⁾	37000 : 1
Non-linearity	±0.5 %

\\ TECHNICAL SPECIFICATIONS

CAS 140D-HR High Resolution Array Spectroradiometer	
Model / Central wavelength	941 nm
Spectrograph	
Focal length	Approx. 120 mm, f/3.5
Grating	Plane reflection grating, 1800 lines/mm
Filter wheel	Available density filters: OD 0.5, 1, 1.5, 2, 2.5
Sensitivity	
Measuring range radiant flux ⁴⁾	3 μw – 8.2 kW
Electrical data ⁵⁾	
AD converter	16 bit resolution
PC interface	USB 2.0 or Ethernet
Triggering	1 TTL input with ascending slope; 2 software-controlled TTL outputs; 1 TTL output with flash pulse
Baseline noise ⁶⁾	±0.4 %
Miscellaneous	
Dimensions (H, W, D)	144 mm x 341 mm x 359 mm
Power supply	Wide-range input 100 – 240 VAC 50/60 Hz
Power consumption	Max. 70 VA
Ambient temperature	15 – 35 °C; relative humidity 0 – 70 % max., non-condensing
Weight	Approx. 9 kg
Valid standards	In conformity with CE (2014/30/EU, 2014/35/EU, 2011/65/EU, 2012/19/EU), FCC §47 Part 15 Subpart B, KC

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¹⁾ Further spectral ranges upon request.

²⁾ Applies to Penray lamp or laser.

³⁾ For a single acquisition with 4 ms integration time.

⁴⁾ Applies to a signal-to-noise ratio of 10:1. Measured with integrating sphere ISP100B. Upper limit calculated.

⁵⁾ Further details see CAS 140D-HR Operating Instructions.

⁶⁾ With shortest integration time, without averaging and with 50 % modulation. This value improves with appropriate averaging (e.g. 9x averaging results in a 3x reduction of noise).

\\ ORDERING INFORMATION ¹⁾

Order number			Product code options				
Product code	Central wavelength	Interface	Slit	Filter wheel	Grating		
CAS140D[Central wavelength][Interface][Slit][Filter wheel][Grating] e.g. CAS140D0941U2K1	e.g. [0941] with grating [1]: 902 – 982 nm	[U] USB [E] Ethernet	[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	Slit	Filter wheel	Grating
902 – 982 nm	0.2 nm	0.08 nm	[0941] 941 nm	[U] USB	[2] 50 μm	[K] OD 1/1.5/2/2.5	[1] 1800 lines/mm