

# CAS 140CT-HR

## High Resolution Array Spectroradiometer

### Key features at a glance

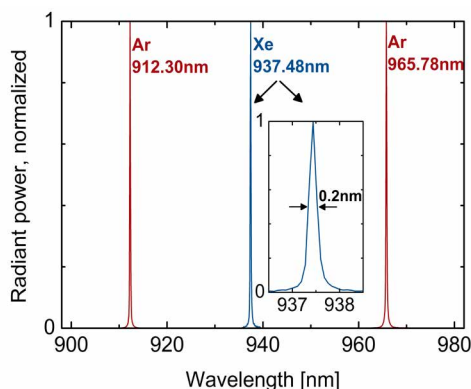
- ▲ High resolution down to 0.2 nm FWHM, 0.08 nm data point interval
- ▲ High-end CCD detector actively cooled to -10 °C
- ▲ Down to 9 ms integration time
- ▲ Integrated density filter wheel



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 <sup>1)</sup>	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 <sup>2)</sup>	±0.05 nm
Integration time	9 ms – 65 s (PCIe); 10 ms – 65 s (USB)
Sensor dynamic range <sup>3)</sup>	30000 : 1
Non-Linearity	±0.5%

## \\ TECHNICAL SPECIFICATIONS

CAS 140CT-HR High Resolution Array Spectroradiometer	
<b>Spectrograph</b>	
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
<b>Electrical data</b>	
AD converter	15 bit resolution
PC interface	Standard: USB 2.0; optional: PCIe bus plug-in card <sup>4)</sup> 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 <sup>5)</sup>	±60 counts, or ±0.4 %
<b>Miscellaneous</b>	
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 <sup>1)</sup>

Order number		Product code options					
Product code		Central wavelength	Interface <sup>4)</sup>	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 <sup>4)</sup>	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

<sup>1)</sup> Further spectral ranges upon request.

<sup>2)</sup> Applies to Penray lamp or laser.

<sup>3)</sup> For a single acquisition with 10 ms integration time.

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

<sup>5)</sup> 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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Instrument Systems GmbH | Neumarkter Str. 83 | 81673 Munich, Germany | ph: +49 (0)89 45 49 43-58  
 fax: +49 (0)89 45 49 43-11 | info@instrumentsystems.com | www.instrumentsystems.com