Instrument Systems
KONICA MINOLTA Group

CAS 125 Array Spectrometer

Productivity and Reliability

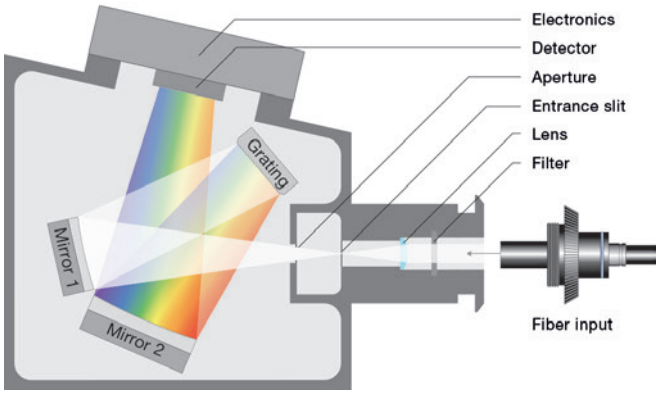
Key features at a glance

- Very short integration times down to 10 µs
- 2048 pixels CMOS sensor with thermal stabilization
- Recipe Mode for ultrafast measurement sequences
- Max. scan rate of 3700 scans/s
- Robust housing with smaller footprint

The new CAS 125 extends the series of well-established high-performance spectroradiometers from Instrument Systems into the field of price-sensitive applications such as LED production testing and quality assurance. The “plug & play” function allows a high degree of process reliability. The system automatically recognizes the connected accessories and ensures that only current and valid calibrations are used. The novel recipe mode significantly increases productivity in time-critical high-throughput applications.

\\ PROVEN OPTICAL SETUP

A crossed Czerny-Turner spectrograph forms the core of the CAS 125. The optical setup is adopted from the proven CAS 140D which is the undisputed industry standard for laboratory applications. This design guarantees maximum optical precision with exceptionally good stray light rejection.



Optical setup of the CAS 125 with optimized crossed Czerny-Turner Spectrograph.

\\ VERSATILE IN APPLICATION

Unique technical innovations integrated in the CAS 125 result in a high level of reliability and speed. A thermal stabilization of the sensor ensures operation independent from changing environmental conditions. Model variants ranging from 200 nm up to 1100 nm and the high-quality optical setup guarantee precise results for diverse measurement tasks. The economic design with a robust housing and smaller footprint is specially designed for the demanding conditions experienced in 24/7 operation.

The new CAS 125 satisfies the high requirements on accuracy and versatility from high-volume production applications to diverse laboratory tasks.

Model Information	
Model	**Filter wheel**
[151] VIS (360 – 830 nm) [153] VIS/NIR (380 –1040 nm) [156] UV/VIS/NIR (300 – 1100 nm) [157] UV/VIS (200 – 830 nm)	Various filter-wheel combinations are available (OD 0.5 to OD 4; max. 7 filters)

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\\ EXTENSIVE SOFT- & HARDWARE PACKAGE

The CAS 125 is equipped with Ethernet interface and hardware trigger. The integrated density filter wheel and the dark-current shutter additionally facilitate fully automated measurements over an extremely broad signal range. A software development kit (SDK) with DLL driver allows fast and easy integration of the CAS 125 into production environment. In addition, SpecWin Pro and SpecWin Light provide an extensive range of spectral analysis tools and hardware interfaces for diverse laboratory tasks.

\\ "RECIPE MODE" FOR ULTRAFAST MEASUREMENT SEQUENCES

The DLL enables the merging of several thousand measurements into combined recipes, which are loaded onto the CAS 125 upon execution. The subsequent measurements are carried out step-by-step in a hardware-triggered mode avoiding long communication times with the computer between successive measurements. Thanks to an internal buffer and parallel readout of the test data, the recipe can be carried out with minimum delay time, which drastically enhances the units-per-hour in production environments.

\\ TECHNICAL SPECIFICATIONS

CAS 125 Array Spectrometer				
Model	**UV/VIS**	**VIS**	**UV/VIS/NIR**	**VIS/NIR**
Spectral range	200 – 830 nm	360 – 830 nm	300 – 1100 nm	380 – 1040 nm
Detector [1]	CMOS			
Number of pixels [2]	2048			
Spectral resolution 100 µm slit width	3.0 nm	2.2 nm	3.7 nm	3.0 nm
Data point interval	0.72 nm	0.53 nm	0.91 nm	0.76 nm
Wavelength accuracy	±0.2 nm			
Integration time	10 µs – 10 sec			
Shortest duration SOT to EOT [3]	280 µs			
SOT to SOT (Recipe Mode) [3]	550 µs			
Max. scan rate [3]	3700 scans/sec			
Dynamic range [4]	7000:1			
Non-Linearity	±0.6 %			
Stray Light				
Broadband for Illuminant A [5]	$7*10^{-4}$	$5*10^{-4}$	$7*10^{-4}$	$7*10^{-4}$
For LED [6]	$1*10^{-4}$			
With Laser [6]	$5*10^{-5}$			
Sensitivity				
Measuring range Irradiance [7]	0.3 µW/m² nm– 200 kW/m² nm	0.2 µW/m² nm – 100 kW/m² nm	0.1 µW/m² nm – 90 kW/m² nm	0.2 µW/m² nm – 100 kW/m² nm
Measuring range Luminous intensity [8]	60 µcd – 40 Mcd	40 µcd – 30 Mcd	30 µcd – 20 Mcd	40 µcd – 30 Mcd
Measuring range Luminous flux [9]	0.3 mlm – 100 Mlm	0.2 mlm – 100 Mlm	0.2 mlm – 80 Mlm	0.2 mlm – 100 Mlm
Slit				
Slit options	50 µm, 100 µm, 250 µm	50 µm, 100 µm, 250 µm	50 µm, 100 µm, 250 µm	100 µm, 250 µm (50 µm on request)

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\\ TECHNICAL SPECIFICATIONS

CAS 125 Array Spectrometer				
Model	**UV/VIS**	**VIS**	**UV/VIS/NIR**	**VIS/NIR**
Spectrophotometry				
Baseline noise [10]	0.25 %			
Transmission measuring accuracy [11]	0.8 %			
Baseline drift [12]	0.2 Counts/h			
Spectrograph				
Focal length, f number, grating	Approx. 120 mm, f/3.5, plane reflection grating			
Slit	Standard: 100 µm; optional: 50 µm, 250 µm			
Filter wheel / shutter	Max. 7 slots for density filters OD 0.5 to OD 4; UV/VIS and UV/VIS/NIR with UV density filters; position monitoring with encoder			
Electrical data				
AD converter	16 bit resolution			
PC interface	Ethernet			
Triggering	Input: 5V TTL ascending slope; output: 2 TTL outputs			
Miscellaneous				
Dimensions (H x W x D)	136.5 mm x 233mm x 325 mm			
External Power supply	Wide-range input (external) 100 VAC to 240 VAC 50/60 Hz			
Device Power supply	24 Vdc			
Power consumption	36 VA			
Ambient temperature	15 – 35 °C; relative humidity 70 % max., non-condensing			
Weight	6.6 kg			
Valid standards	In conformity with CE (2014/30/EU, 2011/65/EU, 2012/19/EU), FCC Part15B, KC			
Measurement uncertainty [13]				
Accuracy [14]				
Radiant / Luminous flux	5.0 %			
Radiant / Luminous intensity	5.0 %			
Radiance / Luminance	4.0 %			
Irradiance / Illuminance	4.5 %			
Color coordinates (x,y) [15]	0.002			
Dominant wavelength [16]	0.6 nm			
Instrument precision				
Radiometric integral [17]	0.30 %	0.30 %	0.30 %	0.30 %
Photometric integral [18]	0.50 %	0.35 %	0.50 %	0.35 %
Color coordinates (x,y) [16]	0.0010	0.0018	0.0010	0.0010
Dominant wavelength [16]	0.12 nm	0.30 nm	0.12 nm	0.20 nm

[1] Sensor with thermal stabilization.
[2] Binned to 1024 data points.
[3] Depends on integration time, device settings and performance of operating computer / system.
[4] Single acquisition with 1 ms integration time.
[5] Measured with edge filter OG455 at 400 nm, relative to peak intensity of unweighted spectral data.
[6] Measured 150 nm to left of the peak wavelength, relative to peak intensity of unweighted spectral data.
[7] Measured with optical probe EOP-120 and OFG-414 fiber bundle at 600 nm and signal/noise ratio of 10:1, without averaging.
[8] Applies to a signal-to-noise ratio of 10:1. Measured with LED-436/437 adapter. Upper limit calculated.
[9] Applies to a signal-to-noise ratio of 10:1. Measured with integrating sphere ISP 150L. Upper limit calculated.
[10] 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).
[11] Applies to optimum spectral range; with 10 % transmission and immediatly after recording an averaged baseline.
[12] Typical value. Applies with LS100-130 light source after 2 hour warm-up at constant ambient conditions.
[13] Minimum achievable, extended relative measuring uncertainty applied to a twofold standard deviation. Only applies to the measuring and ambient conditions used for calibration (e.g. without density filter, optimum spectral range, sufficient signal level, etc.
[14] For int.time >1 ms or >100 averages.
[15] For white LED.
[16] For red LED type ACS.
[17] Irradiance/radiance/radiant flux; evaluation range limited to 0.1 % ± 50 nm of peak wavelength.
[18] Illuminance/luminance/luminous intensity/luminous Flux

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