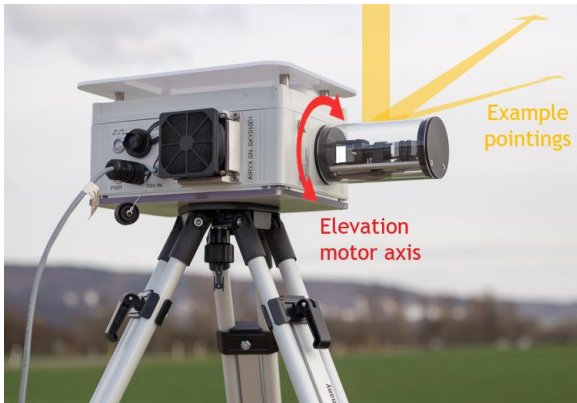
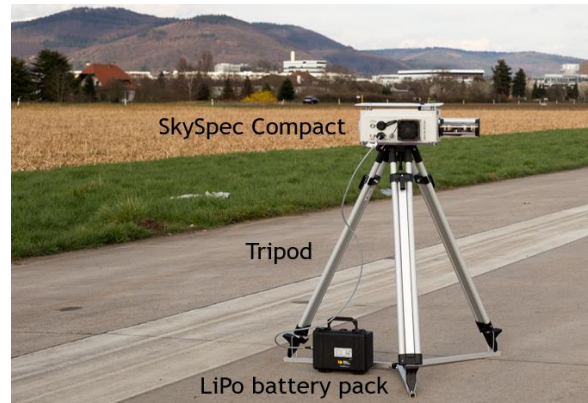


SkySpec Compact Instrument v.200

FAST, ACCURATE AND MOBILE SPECTRAL OBSERVATIONS OF SCATTERED SUN LIGHT



SkySpec Compact



*Field application with tripod and LiPo battery pack
(available accessories)*

The SkySpec instrument series allow users to perform fast, efficient and reliable atmospheric observations with the passive DOAS (Differential Optical Absorption Spectroscopy) method (according to VDI standard 4212). Ultra violet (UV) and visible (Vis) radiation spectra of direct and scattered sunlight in multiple viewing directions are acquired and analysed to obtain information on the spatial distributions of various trace gases (e.g. NO₂, SO₂, HCHO) and aerosols. Also high precision spectroscopic applications other than passive DOAS are possible (e.g. reflectance measurements).

With its small size and low power consumption, the **SkySpec Compact** provides a portable all-in-one solution for easy, mobile, yet precise measurements, even on mobile platforms like a car or a ship. In contrast to other instruments from the SkySpec series, telescope opto-mechanics, spectrometer and an embedded measurement PC are combined in a single box, enabling autonomous data acquisition without the need for additional devices. The integrated GPS records measurement coordinates and assures correct timestamps. The covered spectral range and resolution of the instrument can be adapted to the needs of the user.

APPLICATIONS

- Passive DOAS especially MAX (Multi Axis) - DOAS measurements
- Air quality monitoring and trace gas measurements in urban, rural, polar, and pristine environments
- Vertical profiles of NO₂, SO₂, HCHO, aerosol optical depth
- Long term measurements with low maintenance
- Emission monitoring of power plants, industrial complexes or volcanoes
- Scientific studies involving measurements of NO₂, SO₂, HCHO, HONO, Glyoxal, BrO, IO, Ozone
- Zenith sky/direct sun measurements for stratospheric measurements of Ozone, NO₂, BrO
- Spectral analysis of surface reflection

The ultra-low stray light spectrometers are temperature stabilized with a precision better than 0.02 °C to allow stable and reliable recording of spectral data. The motorised prism telescope can realise viewing elevation angles from -10° to 190° and includes an inclination sensor with automatic elevation adjustment. This allows for fast deployment without the need for levelling the instrument and even for real-time elevation correction on moving platforms.

Due to the absence of moving parts on the outside, the telescope design assures long life time and reliable operation in harsh environmental conditions (e.g. snow or high aerosol loads). Further, the integrated telescope heating activates below 5 °C and avoids snow and ice on the optics. With an overall power consumption of typically 20-30 W at a supply voltage of 10-15 V battery usage for mobile measurements is possible (optional LiPo pack available). The sun roof reduces the risk of overheating due to long exposure in direct sunlight.

PROPERTIES (TYPICAL)

Wavelength range	400 - 460 nm (standard) ^{*1}	Mechanical stability	Water proof (IP 64), sun roof, robust and simple mounting
Spectral resolution	≈ 0.6 nm FWHM (standard) ^{*1}		
Optical filter	Schott BG3 or BG40 ^{*1}	Additional Sensors	Temperature: 1 °C accuracy, telescope, spectrometer, electronics
Noise	10 ⁻⁴ at 1000 scans (≈ 60 s integration time)		Pressure: 0.5% accuracy, ambient
Quantum efficiency	UV: 60% (UV, back-thinned detector)		Humidity: ± 3% accuracy in relative humidity, Sensor inside instrument.
Spectrometer temp. stability	20 °C (adjustable), ± 0.02 °C	Measurement software	Included, customizable measurement routine (angles, time resolution) on embedded PC with Windows 10 Prof.
Wavelength calibration	Highly stable in-house calibration (typ. shifts < 0.01 nm), manual re-calibration possible with mercury (HG) lamp	Start-up time	< 3 min
Operation temperature range	-10 °C to 40 °C ²	Data communication	LAN / WiFi
Elevation range and accuracy	-10° to 190°, ± 0.2° automatic elevation correction	Power consumption	Typ. < 30 W (max. 100 W), 12 V
Field of view FWHM, vertical x horizontal	≈ 0.3° x 1°	Weight	≈ 7 kg
GPS	Included	Size	47 x 26 x 16 cm ³
Telescope heating	Automatic, if temp. below 5 °C		

^{*1} Custom specifications with different wavelength ranges are possible within certain boundary conditions to guarantee optimum spectroscopic measurements.

^{*2} Temperature can exceed the operation range in direct sun light.

OPTIONAL COMPONENTS & CONFIGURATIONS

- Custom spectrometer configuration and low cost spectrometers
- Integrated, wide FOV camera (covering 0° to 90° elevation) to monitor measurement conditions
- Handheld mercury (HG) calibration lamp
- Tripod with adapter plate
- Mobile LiPo battery in a Peli case (50 Ah, 13.6 V)
- Spare parts and maintenance set
- Instrument also available without GPS
- Spectral data analysis package
- Online installation and support service

ADVANTAGES

BENEFITS	INNOVATION
High measurement accuracy	<ul style="list-style-type: none"> • Ultra-low stray light spectrometers • Stable spectrometer temperatures, low noise • Spectrometer characterization included: wavelength calibration, offset, dark current, non-linearity • Continuous measurement and fast automatic correction of telescope elevation • Small telescope field of view (FOV)
Simple setup & operation	<ul style="list-style-type: none"> • All in one instrument, no external device like PC required • Fast instrument power-up, only connect power • Fast, accurate and reproducible due to built-in inclination sensor • Low maintenance, easy cleaning of optics • Easily adaptable measurement routine
Long lifetime	<ul style="list-style-type: none"> • Without outside moving parts • Water proof with IP64, snow resistant
Mobile application	<ul style="list-style-type: none"> • Low power consumption • Compact and small size