DIFFERENT THINKING.
BETTER MEASURING.

A SPIN-OFF FROM THE UNIVERSITY OF HEIDELBERG
INSTITUTE OF ENVIRONMENTAL PHYSICS

info@airyx.de
WEB: airyx.de

SkySpec Compact Instrument v.200

FAST, ACCURATE AND MOBILE SPECTRAL OBSERVATIONS OF SCATTERED SUN LIGHT

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. These measurements provide information on the tropospheric (and stratospheric) distribution of various trace gases, e.g. NO_2, SO_2, formaldehyde, and aerosols. Also other high precision spectroscopic applications are possible (e.g. reflectance measurements).

Due to 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. An embedded PC enables autonomous data acquisition without the need for additional devices while the integrated GPS records measurement coordinates and assures correct timestamps.

The covered spectral range and resolution of the instruments can be adapted to the needs of the user.

The ultra-low stray light spectrometers are temperature stabilized with an accuracy of <0.1°C to allow stable and reliable spectral data. The prism telescope has a scanning range from -10° to 190° supported by an inclination sensor for fast, automatic elevation adjustment on uneven ground or 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. More information can be found in the general SkySpec instrument description.

APPLICATIONS

- Passive Multi Axis DOAS measurements
- Air quality monitoring and trace gas measurements in urban / rural and pristine environments
- Mobile application on vehicles and ships
- Measurement of NO_2, SO_2, HCHO, Aerosol and other concentration profiles
- Emission plume studies of e.g. power plants, industrial complexes or volcanoes
- Total flux measurements of e.g. NO_2/SO_2/HCHO of power plants, industrial complexes, cities or volcanoes
- Scientific studies involving measurements of NO_2, SO_2, HCHO, HONO, H_2O, Glyoxal, BrO, IO, Ozone
- Zenith Sky measurements for stratospheric measurements of Ozone, NO_2, BrO
- Spectral analysis of surface reflection

FIND MORE INFORMATION ON SKYSPEC PRODUCTS AND PERFORMANCE IN THE GENERAL SKYSPEC INSTRUMENT DESCRIPTION.

PROPERTIES (TYPICALLY)

Wavelength range	300 – 460 nm (standard)*1
Spectral resolution	~ 0.6 nm (standard)*1
Noise	10^{-4} at 1000 scans (int. time ~60s, 60% saturation)
Quantum efficiency	60 % (UV, back-thinned detector)
Wavelength calibration	Provided
GPS	Included
Telescope scan range	- 10° to 190°
Vertical FOV	~ 0.3°
Elevation adjustment	inclination sensor (accuracy ~0.2°)
Optical filter	SCHOTT BG3 or BG40 *1
Telescope heating	automatic, if temp. below 5°C

Additional sensors	- Ambient pressure - Humidity inside instrument - Temperature of telescope, spectrometer, electronic
Data acquisition	Embedded PC OS: Win. 10 Prof.
Start-up time	< 3 min
Data communication	LAN / WiFi
Power consumption	Typ.<30W (max. 100W) at 12V
Weight	~ 7 kg
Size	47 x 26 x 16 cm^3
Mechanical stability	water proof (IP 67), sun roof, robust and simple mounting
Operation temperature range	-10°C to 40°C *2

COMMENTS:
*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

- **Integrated image camera (view 0° to 90° elevation)**
- **Hand held mercury (HG) calibration lamp for manual wavelength re-calibration**
- **Tripod with adapter plate**
- **Mobile LiPo battery in a Peli case (50 Ah, 13.6 V)**
- **Custom spectrometer configuration and low cost spectrometers**
- **Without GPS**
- **Spectral data analysis package**

ILLUSTRATION (EXAMPLE)

Field application with optional LiPo battery pack (available accessory).

ADVANTAGES

BENEFITS	INNOVATION
High measurement accuracy	• Ultra-low stray light spectrometers • Stable spectrometer temperatures, low noise • Non-linear spectrometer characterization included • Continuous measurement and fast automatic correction of telescope elevation • Small telescope field of view (FOV) measurement routine adaptable
Simple setup & operation	• 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
Long lifetime	• Without outside moving parts • Water proof with IP67
Mobile application	• Low power consumption • Compact and small size

Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages
eXIST Existenzgründungen aus der Wissenschaft