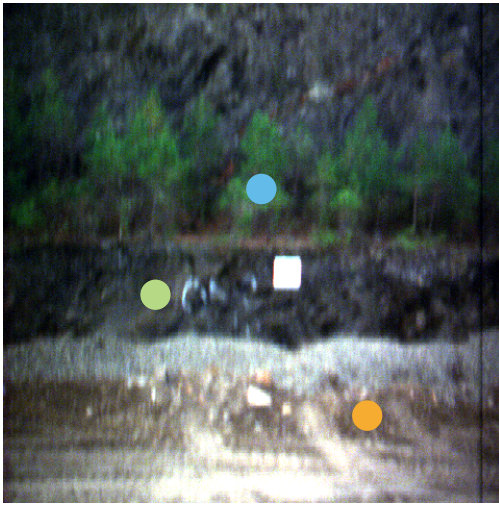# BLACKBIRD
VNIR Sensor

HAIP Solutions BlackBird VNIR Sensor is the easiest way to take hyperspectral images on drones. With a weight of less than 600g, it is especially designed for the use with DJI drones from the Matrice 200 & 300 series. The first hyperspectral Plug and Play solution for drones.

BlackBird can take images of RGB and HSI simultaneously through the same light channel with the same spatial dimension. The hyperspectral sensor provides a native image resolution of 540x540 pixels with 250 spectral channels, continously covering the wavelength range from 500 nm to 1000 nm.

Features

- Smart Hyperspectral Line-Scanner

- No external movement needed

- VNIR (500-1000 nm)

- High Signal-to-noise ratio in NIR range

- 250 spectral bands

- Super lightweight design (<600 g)

- RGB + HSI simultaneously

- Internal CPU for pre-processing

BlackBird True Color, native resolution, mounted on UAV. The corresponding spectra inside the circles are given on the right.
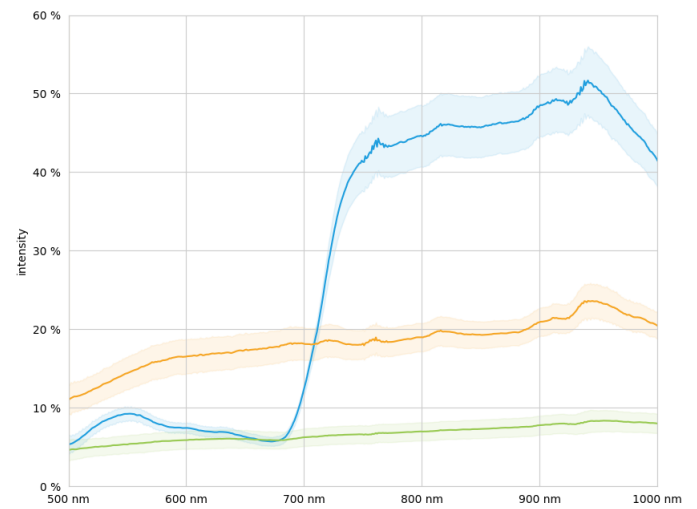
High spectral quality with low noise. The diagram above shows the standard deviation of all averaged pixels inside each drawn circle.

Spectral Properties	
Wavelength range	500-1000 nm
Number of bands	250
Spectral resolution	5 nm
Spectral sampling	2 nm
Spatial Properties	
Resolution RGB	1080 * 1080 px
Resolution Spectral	540 * 540 px
Optical Properties	
Field of View (FOW)	28°
Sensor Properties	
Detector	CMOS
Sensor size	2 Megapixel
Radiometric resolution	10 bit
Integration time (cube)	< 4 seconds
Data size (raw)	600 MB/ Data cube
Camera Properties	
Connection	DJI Skyport
Operation temperature	-10 - +50°C
Protection class	IP 40
Power consumption	5V DC / 15 W
Size	60 * 60 * 82 mm
Weight	280 g
Weight (incl. Gimbal)	< 600 g

Perfectly implemented on DJI drones

BlackBird is based on a hyperspectral line-scanner, but there is no need to move the sensor during image acquisition to get a full hyperspectral data cube. During image acquisition the drone hovers over one spot and with the included gimbal the sensor is perfectly stabilized.

Camera control and power support works with DJIs Skyport interface and via the remote controller. Through the DJI API you get features such as remote camera trigger, RGB-livestream and flight-planning support. Further new features will be implemented in the future.

Data is stored on an external, removable microSD card to minimise downtime during data transfer on the ground. Additional pre-processing on camera is possible, as the camera has a build in computing unit. If needed the desired spectral ranges can also be individually selected, to reduce the amount of data. A special rugged housing is also available with higher IP ratings to ensure robustness depending on your needs.