

UAV Hyperspectral Imager Solution Launched



Leica Geosystems, Aibotix and Headwall Photonics have introduced an integrated high performance airborne sensor solution utilising a hyperspectral imager and the Aibot X6 UAV. The Nano-Hyperspec sensor was optimised in terms of size, weight, and power to enable the aerial acquisition of all spectral and spatial data within the scene of interest. A UAV with integrated Headwall sensor has already been successfully flown and will be presented at this year's Intergeo in Berlin.

Precision agriculture, forestry, geological research, and environmental monitoring are just a few specific application areas that benefit from this airborne hyperspectral imaging solution. Equipped with the hyperspectral imager, the Aibot X6 can, for example, take pictures of fields or vineyards to determine the chlorophyll content, plant health, invasive species, and thus offer farmers information on the state of the plants and harvest. By means of UAV and hyperspectral imager, farmers can measure before harvest, where the grain is driest and should be mowed first. Or, they determine where the rain has washed more fertilizers and where they must re-fertilise. For geological mapping in the vicinity, for example landfills and open mine sites can be overflowed to quickly and efficiently track precious metals or minerals. Environmental monitoring and research to derive contamination of soil or water is determined spectrally from the air quickly using the Aibotix UAV and Nano-Hyperspec sensor.

Capabilities and performance

The Nano-Hyperspec sensor measures only 76.2mm x 76.2mm x 119.4mm and weighs less than 0.68kg. A key enabling feature is that this sensor is integrated with a high speed data processor and high capacity flash storage. The sensor collects image data across 640 spatial bands and 270 spectral bands with a Visible-Near-Infrared (VNIR) range of 400-1000nm. The field of view is exceptionally wide, meaning that flight swath efficiency is maximised to cover as much territory as possible while the UAV is aloft. Further, it delivers crisp image data not only directly underneath the flight path but off to the edges.

Ortho-rectification

The integrated data storage is 480GB, which will yield more than two hours at a frame-rate collection rate of about 100fps, which is matched to the actual performance of the UAV itself. The direct-attached GPS with IMU yields the ability to generate ortho-rectified imagery data products. Finally, the Nano-Hyperspec comes pre-loaded with an airborne version of its Hyperspec III application software that manages sensor operation, image acquisition, and sensor performance while aloft. Hyperspec III software is designed to work in a complementary fashion with the GPS/IMU as well as incoming Lidar data to collect spectral data and generate a completely integrated hyperspectral data cube.

For more information on the Aibot X6 UAV [see here](#).