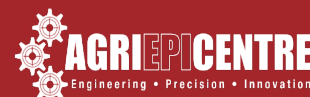




# Hyperspectral UAV



Agri-EPI Centre has invested in the Hyperspectral UAV. Compared to multispectral imagery, hyperspectral imagery measures energy in narrower and more numerous bands, thus giving much more information on target. Hyperspectral image data is 3D cube, where each pixel holds a full spectrum across the range. Since spectra are as unique as 'fingerprints' to target, hyperspectral imagery can unveil features that multispectral imagery may miss out on.

Hyperspectral imaging technology has been under research for decades and has been demonstrated to be very powerful in many application areas including agriculture. Especially in recent years, with a more robust and rugged imaging product embedded onto the UAV platform, agri-tech has seen revolutionary improvements.

The HySpex turnkey UAV solution with Mjolnir VS-620 and Lidar includes all the necessary hardware and software for flight planning, data collection, data processing and calibration. The system is provided with a UAV platform, 3-axis gimbal mount for the hyperspectral unit with Lidar and corresponding spectral calibration, radiometric calibration and geometric calibration. The geometric calibration includes a sensor model for VNIR and SWIR hyperspectral sensor heads, subpixel co-alignment of the 2 sensor heads, boresight calibration of the 2 sensor heads and internal IMU system, boresight calibration of the Lidar unit and internal IMU system.

There's a broad application potential, including but not limited to:

- Drought/water/nutrient stress monitoring
- Plant pathogens detection
- Analysis of soil properties/Determination of soil types
- Land mapping
- Yield forecasting
- Land management

They Hyperspectral UAV has potential use as groundtruth technology for other technologies/systems as well.

## UAV System (XQ-1400S BFD HySpex Edition):

1. <25 kg MTOW with Mjolnir and gimbal
2. Up to 25 min flight endurance with 8 kg payload
3. Fitted with high performance GNSS/GPS and IMU to enable data to be captured to high geolocation accuracy
4. Fitted with advanced 3-axis digital gimbal to compensate for the pitching

## Sensing System (HySpex Mjolnir VS-620, Velodyne VLP-32C) :

1. Fully-integrated co-aligned hyperspectral visible and near-infrared (VNIR) and short-wave infrared (SWIR) (400 – 2500nm) and LiDAR sensors, along with in-flight data capture and storage system
2. Spectral coverage of 400 – 2500 nm, with spectral resolution of 3 nm in VNIR and 5.1 nm over SWIR range. Bit resolution 12bit in VNIR and 16 bit in SWIR.
3. Double resolution data in the VNIR range
4. High-resolution (0.33 degree) LiDAR sensor, with 360° surround view with real-time 3D data

For information on renting out our technical assets please contact [team@agri-epicentre.com](mailto:team@agri-epicentre.com).