Headwall is the proud recipient of these honors and more...

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Headwall

Nano HP™ VNIR and LiDAR on DJI Matrice 350

Hyperspectral Imaging + LiDAR on DJI's Flagship Drone

FEATURES

- Unrivaled portability, reliability, and SWaP
- Factory integrated and flight tested
- Available LiDAR for high-res DEM (Digital Elevation Model) creation and 3D point clouds
- Perfect for environmental monitoring, precision agriculture, mining, and more.

DATASHEET

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THE IDEAL SYSTEM FOR VNIR REMOTE SENSING UAV MISSIONS

DJI's upgraded flagship drone, the **Matrice 350** RTK, features numerous improved systems, as well as an all-new control experience, and even longer flight time. However, compared with other UAV platforms, the M350's limited lift capacity means that not all remote sensing systems are supported.

Headwall's **Nano™ HP VNIR** follows in the footsteps of the original Nano-Hyperspec® that became the best-selling system of its kind. In fact, the Nano HP blazes a trail forward, being the only hyperspectral imaging payload with available LiDAR (Light Detection and Ranging) that is ready to fly on the DJI M350.

PORTABLE AND ROBUST

The Headwall Nano HP comes with a high-performance GPS/IMU and enables **LiDAR** to be added as an integral module, so that a Nano HP with LiDAR is actually lighter and smaller than a similarly equipped original Nano-Hyperspec!

Figure 1. Headwall UAV systems utilize a quick-release mechanism between the drone and the payload that allows easy removal of the sensor suite for transportation or storage.

FEATURE	HEADWALL	COMPETITION
Turnkey Systems, Everything You Need	✓	✗
Light Weight, Low Power Consumption	✓	✗
Compact, Solid-State Data-Acquisition System	✓	✗
CE-Certified VNIR Sensor	✓	✗
Available LiDAR and Data-Fusion Options	✓	✗
Factory-Made Holographic Gratings	✓	✗
All-Reflective, Aberration-Corrected Design	✓	✗

The platform-agnostic, browser-based **HSInsight™** interface makes setting up your Nano HP easy.

The Nano HP can be purchased as part of an integrated turnkey system that includes the drone, or as a payload for integration onto your DJI M350. If you require an NDAA-compliant or Blue UAS drone, contact us about options, including the Freefly Alta X that is made in the USA.

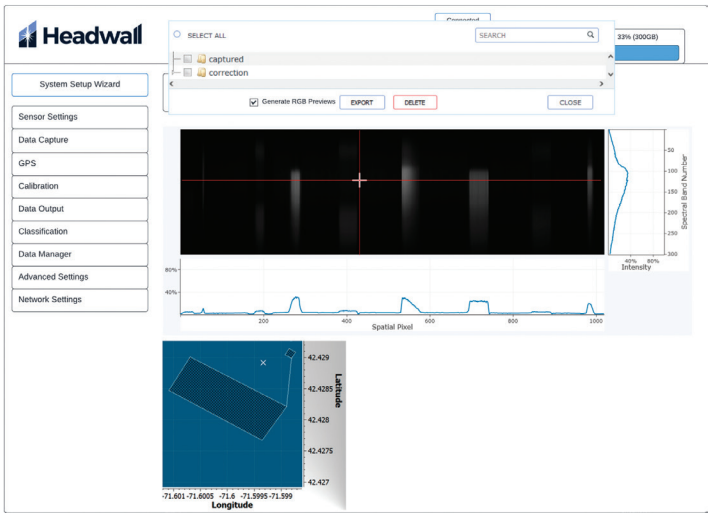

Figure 2. Our platform-agnostic HSInsight interface provides control over your Nano HP. Calibrate, adjust settings, and select data-capture parameters using a web browser.

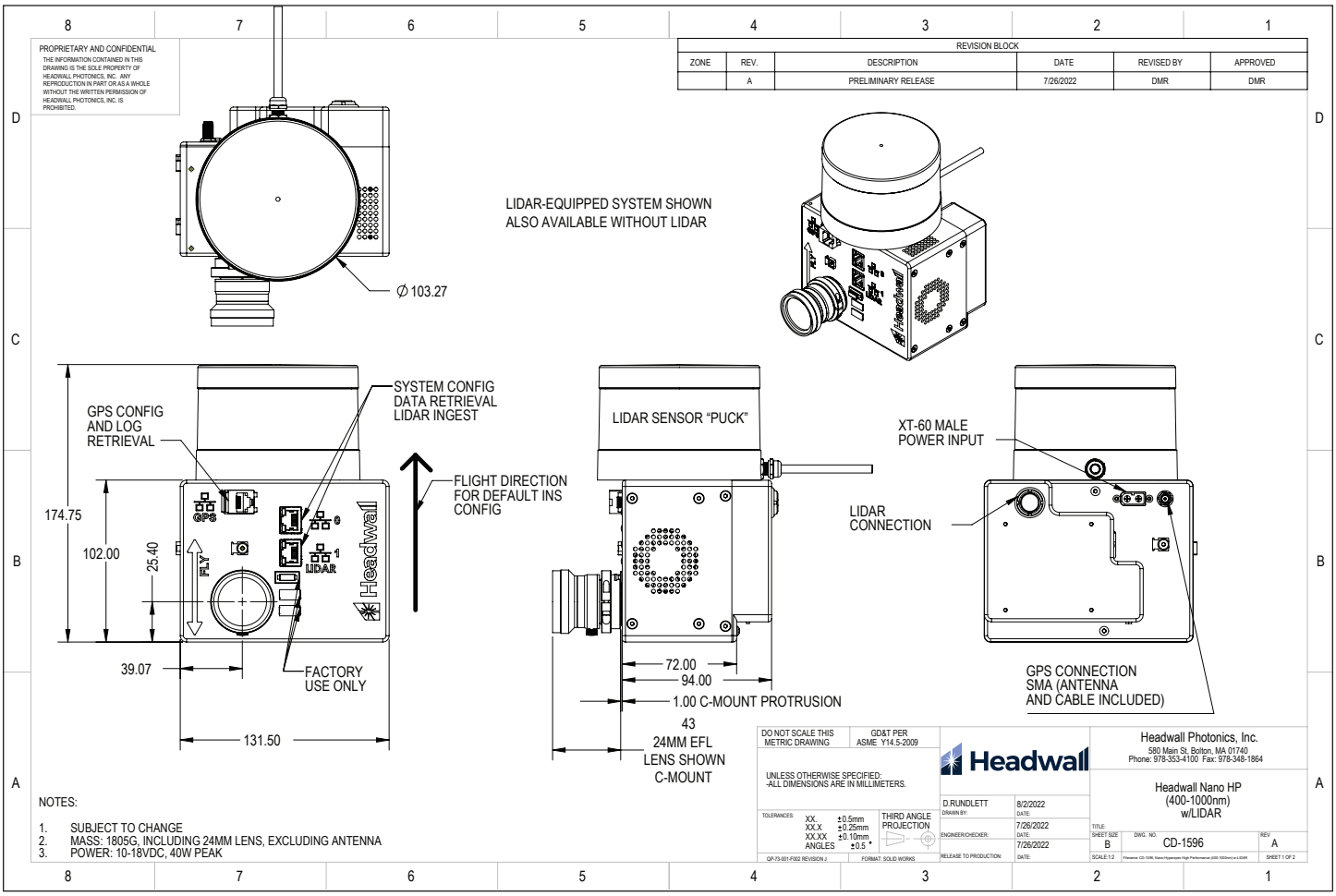

Figure 3. The Headwall Nano HP system equipped with LiDAR is shown here, much smaller and lighter than the previous-generation Nano-Hyperspec® when similarly configured. All user-accessible ports for power and data I/O are labeled, as is the direction of flight. Contact Headwall Customer Support for more complete dimensional drawings of this configuration or the configuration without LiDAR.

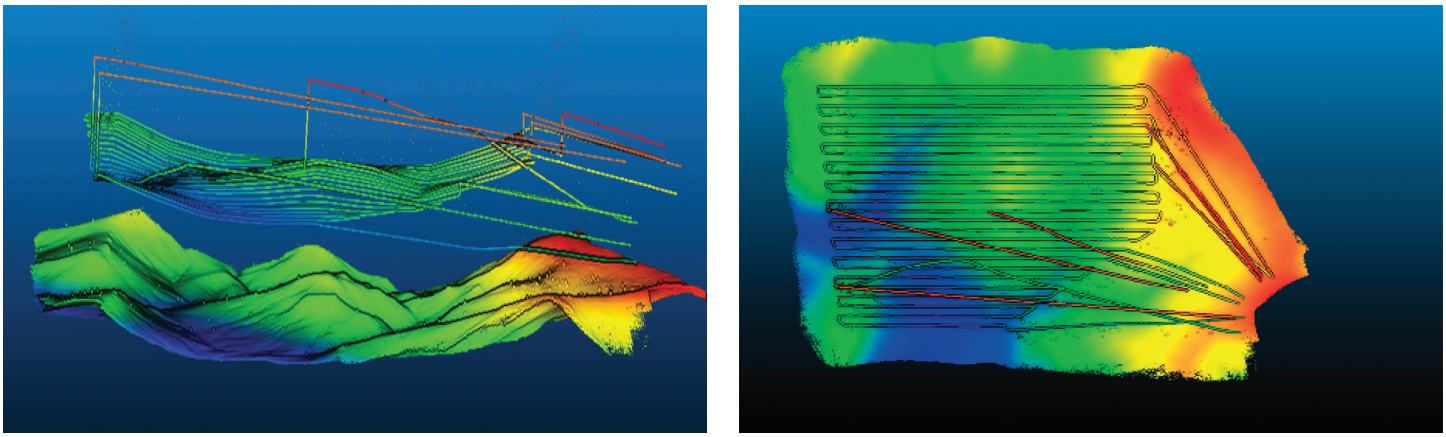

Figure 4. The images above are 3D point clouds generated from an optional LiDAR sensor that was part of the payload during a hyperspectral UAV mission to Cuprite, Nevada by a team from Headwall and the University of Arizona. LiDAR allows high-resolution digital elevation models (DEMs) to be created to enable more precise flight operations as well as more accurate orthorectification of the hyperspectral imaging data.

Headwall UAV systems are programmed to follow terrain at a constant altitude above ground level. The hyperspectral data that is captured from the air is post-processed and orthorectified so that a consistent nadir view of the mission area is achieved. You can see on the left that the aircraft enters and departs the capture area along straight lines. While inside the capture polygon designated as part of the flight plan, the hyperspectral sensor is activated and a lawnmower pattern is flown as shown in the image on the right.

DATASHEET

Nano HP™ and LiDAR on DJI Matrice 350

COMPLETE SYSTEMS FOR HYPERSPECTRAL REMOTE SENSING UAV MISSIONS

Because you may travel to locations that give additional meaning to the word “remote” in remote sensing, Headwall turnkey systems feature UAVs that fold and disassemble to more **easily transportable** sizes that can be quickly deployed in the field.

Rechargeable batteries supply power to all systems, and additional batteries as well as chargers are available to extend your missions.

Training sessions, both in person and online, are given by experts who are not only makers but users of our systems, and have successfully completed missions at a variety of locations around the world.

Some UAVs such as the DJI Matrice 350 can be folded into a more compact shape for transport to and from your mission location.

SPECIFICATIONS	
Wavelength Range	400 – 1000 nm
Spectral Bands	340
Spatial Pixels	1020
Camera Technology	CMOS
Pixel Pitch	5.86 µm
Aperture	f/2.5
Dispersion/Pixel	1.76 nm
Entrance Slit Width	20 µ
Spectral FWHM	6 nm
Frame Rate (Sustained)[3]	250 Hz
ADC Bit Depth	12 bits
Spectrograph Design	Aberration-Corrected
Digital Interface	GigE
GPS/IMU	Internally Mounted High-Performance with PPK[4]
Usable Data Storage	420 GB Solid-State
Weight (without / with LiDAR)	1.05 kg (2.32 lbs) / 1.73 kg (3.81 lbs)
Base Dimensions (without / with LiDAR)	132 x 102 x 73 mm (5.2 x 4.0 x 2.9 in) / 132 x 175 x 99 mm (5.2 x 6.9 x 3.9 in)
Power without LiDAR (typical)	14.4 W
Operational Temp Range	0 – 40 °C / 32 – 104 °F
Storage Temp Range	-20 – 60 °C / -4 – 140 °F

Part Number	Description
1007A-TBD	Nano HP VNIR Turnkey Package on DJI M350 UAV
1007A-TBD	Nano HP VNIR Turnkey Package with LiDAR on DJI M350 UAV
1007A-TBD	Nano HP VNIR Turnkey Package for DJI M350 UAV
1007A-TBD	Nano HP VNIR Turnkey Package with LiDAR for DJI M350 UAV

[1] RTK (Real-Time Kinematic) feature not currently utilized for positioning. See Headwall White Paper, “RTK vs. PPK Explained” for more information.

[2] Subject to availability by the manufacturer

[3] Configuration dependent. 200 Hz with LiDAR enabled

[4] High-Performance GPS-IMU utilizes Post-Processing Kinematics (PPK) for increased measurement accuracy

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