

SKYTRAC Enables Iridium Certus™ Global Line of Sight Communications (GLOS™) Onboard Platform Aerospace's® Record-Breaking Vanilla Unmanned™ UAV for NASA Arctic Mission



Photo Credit: Platform Aerospace

Platform Aerospace owns and operates Vanilla Unmanned, an ultra-long flight endurance Intelligence, Surveillance, Reconnaissance (ISR) Unmanned Aerial Vehicle (UAV) platform.

Background

Platform Aerospace is an industry leader in rapid aircraft and UAV modification and system integration with the expertise to meet the growing demand for UAVs as they become an integral part of the aerospace industry. On September 24th, 2021, Platform Aerospace launched Vanilla Unmanned and recovered the UAV 8 days, 50 minutes, and 47 seconds later on October 2nd, officially breaking the World Air Sports Federation world record for unrefueled, internal combustion endurance of an unmanned aircraft. As a long endurance Group III Unmanned Aircraft System (UAS) used for multi-day surveillance and inspection operations, this is a significant milestone for Vanilla Unmanned.

To support these ISR missions, UAVs including Platform Aerospace's Vanilla Unmanned require reliable Global Line of Sight (GLOS) communications and low latency Command and Control (C2) to ensure safe operation and market acceptance. Traditionally, communication capabilities have been enabled through Radio Frequency (RF), but cannot enable Global Line of Sight (also known as Beyond Visual Line of Sight) communications. Iridium's pole-to-pole global and low latency satellite connectivity offers an alternative solution for UAS BVLOS operations.

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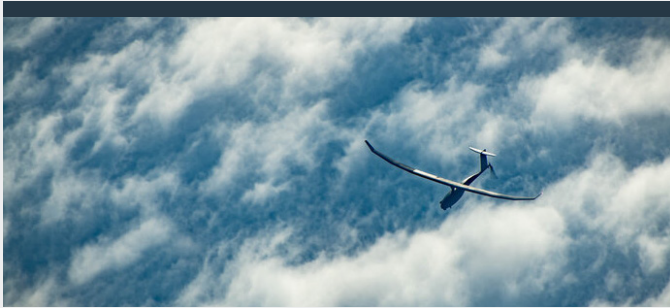


Organization: Platform Aerospace
Location: Hollywood, Maryland, USA
Industry: Unmanned Aviation



Discover SKYTRAC

Over its 35 year history, SKYTRAC has become the partner of choice for data-guided business insights. As an Iridium Aviation Partner, SKYTRAC is well-positioned to leverage Iridium Certus broadband to provide operators with leading capabilities.



U.S. Navy photo by Construction Mechanic 2nd Class Michael Schutt



Vanilla gathers snow and ice thickness RADAR data in the Arctic Circle

Opportunity

In the winter of 2021, Platform Aerospace’s Vanilla Unmanned was contracted for an Arctic environmental monitoring operations on behalf of the NASA Goddard Cryospheric Sciences Laboratory and the University of Kansas (KU) Center for Remote Sensing of Ice Sheets (CReSIS). The sortie represented a multi-payload GLOS mission which required reliable satellite connectivity in harsh Arctic weather to enable telemetry streaming and C2 capability between the UAV and the ground control station.

Maintaining aircraft C2 during GLOS operations is a challenging feat as many datalink solutions are limited by range or geographic coverage. However, SKYTRAC’s DLS-100, by leveraging Iridium’s global connectivity and low latency, offered Platform Aerospace a reliable and cutting-edge solution for real-time C2, telemetry streaming, and GPS connectivity to ensure the safe execution of the scientific expedition. The Iridium Certus DLS-100’s customizable power requirements supported a range of UAV and UAS platforms including that of Vanilla Unmanned making it easily compatible.

SKYTRAC in Action

In December 2021, Vanilla Unmanned flew from Deadhorse, Alaska, a town along the North Slope near the Arctic Ocean, carrying KU’s RADAR for snow depth measurements, multiple state-of-the-art ice detection and anti-icing applications, and SKYTRAC’s Iridium Certus data link transceiver to maintain aircraft C2 during BVLOS operations.

The Size, Weight, and Power (SwaP) optimized Satcom system weighing only

26.2 oz (742.8 g) was ideal for Vanilla Unmanned’s multiple payload capacity.

SKYTRAC’s midband DLS-100’s IP67 compliant modem provided 22 Kbps uplink and 88 Kbps downlink speeds consistently throughout the polar mission, effectively maintaining connectivity for C2 while operating GLOS. By leveraging Iridium’s global, reliable, and low latency connectivity, the DLS-100 supported the polar mission by enabling pilots from the Ground Control Station (GCS) to have real-time C2 with Vanilla Unmanned while simultaneously sending commands and receiving flight telemetry that ensured safe GLOS operations.

Ruggedized for mission-critical operations, the DLS-100 was successfully operable in the austere conditions of the Arctic Circle at 72 degrees north of the equator in temperatures ranging from -17 to -9 degrees Celsius. The DLS-100’s global coverage, resiliency to extreme weather, and low SWaP solution enabled Vanilla Unmanned’s high-risk mission to fly at 2,000 feet altitude at 130 miles range from the base station over the Arctic Ocean with KU’s RADAR solely over Satcom. Vanilla Unmanned successfully fielded the snow radar within the Arctic Circle to collect data on snow and ice thickness while testing the performance of SKYTRAC’s DLS-100 midband Iridium Certus solution.

Conclusion

NASA declared the mission a success after the aircraft not only demonstrated its ability to gather snow and ice thickness data using wing-mounted radar, but also to operate on Satcom

in the harsh Arctic environment. SKYTRAC’s Satcom system provided the reliable connectivity Vanilla Unmanned needed to conduct such BVLOS flight operations safely.

The polar operation illustrates a broader market shift to replace traditionally manned surveying with lower-risk, long endurance UAS. With SKYTRAC Satcom Systems enabling global, low latency, and reliable coverage, this market shift to unmanned technology is not only made safe, but possible. SKYTRAC is proud to offer solutions that are being implemented by UAV industry leaders, such as Platform Aerospace, to extend the boundaries of unmanned technology.

As technologies evolve, so does SKYTRAC. Learn more about how SKYTRAC continues to develop new technologies, including Iridium Certus Satcom options for communications and mission-critical capabilities to expand UAV operations. To learn more, visit go.skytrac.ca/certus.

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DLS-100

SKYTRAC's DLS-100 is an Iridium Certus midband transceiver enabling real-time command and control, telemetry streaming, and photo transfer from unmanned aviation systems.

The ruggedized and IP67 compliant modem enables 22 Kbps uplink and 88 Kbps downlink speeds. Designed for use with unmanned aircraft systems (UAS), the cost-effective Iridium Certus modem allows for pole-to-pole connectivity around the globe with 99.9% reliability and stunningly low latency.

The modem is compatible with commercial and DoD SIM cards and also features remote management functionality through web or software API as needed.



PRODUCT HIGHLIGHTS

- Global Line of Sight (GLOS) Comms.
- Real-time UAS Command and Control (C2)
- UAS and Payload Health Monitoring
- Real-time Flight Data Monitoring (FDM)
- Global Network-based Remote ID
- Flight Data Acquisition
- Easy integration with onboard sensors and servers

INDUSTRY SEGMENTS

The #1 Option for Global L-Band SATCOM

SKYTRAC serves the largest organizations in multiple industry verticals. With 7,500+ global customers on all seven continents, we ensure our products and services are highly reliable and are trusted by those that depend on us for mission-critical applications. Our solutions are designed for both fixed-wing and rotary-wing applications.

We serve the following industries:

- Aerial Firefighting
- Air Transport
- Business Aviation
- Emergency Medical Services
- Law Enforcement
- Military and Government
- Tourism
- UAV

For more information, contact a connectivity expert at sales@skytrac.ca

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