PowerLight Technologies Unveils Laser Power Beaming System to Enable 'Infinite Flight' for DOD Unmanned Aerial Systems

Revolutionary Ground-to-Air Wireless Power Solution Transitions from Component Development to Integrated System Testing

KENT, WA, UNITED STATES, December 16, 2025 /EINPresswire.com/ -- PowerLight Technologies, a leader in safe wireless power transfer, today announced the successful development and subsystem testing of its end-to-end laser power beaming system for Unmanned Aerial Systems (UAS). Developed as part of the Power TRansmitted Over Laser to UAS (PTROL-UAS) program—a strategic initiative sponsored in part by United States Central Command (CENTCOM) —this system combines a new autonomous high-power transmitter with a lightweight, onboard receiver to charge UAS in flight.

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>
> *Tom Nugent, CTO and PowerLight Technologies Co-Founder*

This announcement marks a pivotal point in the program, transitioning from component development to integrated system testing. Pairing a transmitter capable of precision tracking with an airframe-mounted receiver, PowerLight is creating a “wireless power line" through the air, delivering kilowatt-class power over kilometers.

The Transmitter: Precision Tracking and Power Delivery

The core of the system is PowerLight's autonomous high-power transmitter. Designed for mobile and forward-deployed operations, it integrates advanced beam control software with hardware capable of sustaining kilowatt-level laser output.

Key capabilities of the transmitter verified during testing include:

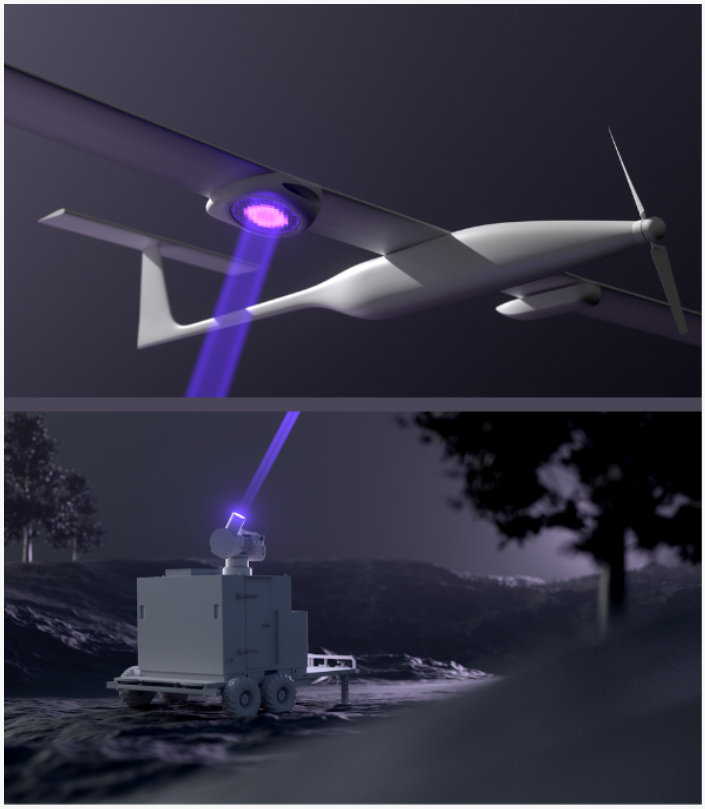
Active Target Tracking: Utilizes high precision optical tracking to lock onto cooperative targets for safe power transfer.

Long-Range Power Beaming: Engineered to transmit to altitudes up to 5,000 feet.

Safety Interlocks: A multi-layer safety architecture, managed via autonomous and operator-in-the-loop methods, ensures safe operation in mixed-use airspace.

Integrated Control Software: Provides real-time control, monitoring, and analytics, integrating with UAS control platforms and ground power infrastructure.

"This is much more than point-to-point power transfer using a laser; we are building an intelligent mesh energy network capability," said Tom Nugent, CTO and Co-Founder of PowerLight. "Our transmitter communicates with the UAS, tracks its velocity and vector, and delivers energy exactly where it's needed. We have now successfully tested the power transmission and tracking algorithms, validating the core architecture needed for our upcoming flight demonstrations."



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The Receiver: Lightweight and Intelligent

Completing the link is PowerLight's new lightweight receiver. Weighing approximately six pounds, the receiver uses laser power converters to capture the non-visible laser energy and convert it to electricity to charge the onboard batteries. An embedded control module collects real-time telemetry and communicates back to the ground station and creates a bi-directional optical data link for future embedded communication capabilities.

Strategic Impact

A key objective of PTROL-UAS is establishing power beaming as an essential capability for delivering operational energy in the air, transforming how autonomous systems are deployed. PowerLight is partnering with Kraus Hamdani Aerospace to integrate the technology into their K1000ULE, an ultra-long endurance UAS supporting US Navy and Army missions.

“The K1000ULE was engineered to deliver endurance once considered unattainable. Integrating PowerLight’s laser power beaming adds a new level of persistence, reshaping the operational reality of theater-wide missions. A platform that doesn’t need to land to refuel or recharge is one

that never blinks,” said Fatema Hamdani, CEO and Co-Founder of Kraus Hamdani Aerospace.

Upcoming Milestones

With the transmitter and receiver subsystems now entering the final stages of validation, PowerLight is preparing for fully integrated flight testing in early 2026. These tests will demonstrate "infinite flight" capability, with the transmitter wirelessly charging an in-flight K1000ULE integrated with a PowerLight laser power beaming receiver.

About PowerLight Technologies

PowerLight Technologies is the world leader in safe, high-power laser energy transmission. With kilowatt□class power and optical communications delivered over kilometers of distance, PowerLight is powering intelligence at the edge. Its dual□use systems enable persistent, mission□critical operations and pave the way for commercialization of power beaming across defense, industrial, telecommunications, and space-based applications — establishing the foundation for autonomy at scale.

About Kraus Hamdani Aerospace

Kraus Hamdani Aerospace builds AI-powered unmanned aerial technologies for the world’s most critical missions, when communications fail, infrastructure breaks down, and seconds matter. With proven deployments across military and commercial sectors, Kraus Hamdani Aerospace has supported the U.S. Army, U.S. Navy, MARSOC, U.S. Customs & Border Protection, and global energy leaders. Founded in 2016 and headquartered in Emeryville, California, the company operates worldwide.

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