TECH OFFER

High-Speed, Long-Range UAV Solution for Advanced Air Mobility

KEY INFORMATION

TECHNOLOGY CATEGORY:
Logistics - Transportation
Logistics - Delivery & Distribution
Infocomm - Smart Cities
Infocomm - Robotics & Automation

TECHNOLOGY READINESS LEVEL (TRL): TRL3
COUNTRY: SOUTH KOREA
ID NUMBER: TO175177

OVERVIEW

Conventional aircrafts have been a preferred mode for fast middle mile delivery within logistics and supply chain. With the increasing traction of drone technology, the usage of drone as a potential alternative mode of transport within the supply chain is greatly considered, given its comparable performance and more sustainable. Current conventional aircraft requires a runway for landing and take-off, limiting their use-case within space constraint areas. For drones, its slow operational speed and short operation range greatly limits it widespread industrial adoption.

The technology owner developed a UAV solution which enables faster operational speed (up to four times) and longer flight duration (over 2 hours) compared to incumbent multicopter drones of the same class. This UAV solution comprises of tilt-electric ducted fans, a hybrid energy source and optimised design to harnesses the advantages from both drone and conventional aircraft technologies. Due to these capabilities, the technology solution enables high-risk and high-difficulty missions to be carried out,

with the safety of the operator in mind, such as wide-area surveillance and reconnaissance, transportation to remote regions and shore-to-ship deliveries.

The technology owner is looking for collaboration partners seeking to further explore drone technologies or integrate drones into existing workflow processes which require longer operational range and faster speed that current traditional multicopter drone is unable to accommodate.

TECHNOLOGY FEATURES & SPECIFICATIONS

The UAV solution features a 3-meter wingspan, fixed-wing fuselage with four tilt EDFs (Electric Ducted Fans) that enables eVTOL (electric vertical take-off and landing) capabilities. It utilises a hybrid energy source system combining batteries and an eco-friendly generator for its operation, increasing its energy density for operation. Due to the proprietary flight control software, the UAV has the capability to fly for over two hours at a maximum speed of 200km/hr, providing 20 times flight range compared to conventional multicopter drones. With the optimised design of the UAV, it has a MTOW (maximum take-off weight) of 65 kg with a total mission payload of 10kg, enabling further customisation of the drone for function-specific applications.

Based on the technical expertise, proprietary airframe design and flight control software, the technology owner envisions an air mobility solution to enable payloads between 200-250kg, maximum operational speed of 400km/hr and potential flight range of 400km, unlocking further capabilities for possible middle-mile transportation mode.

POTENTIAL APPLICATIONS

With a heavier payload, faster operational speed and much longer flight range, the following potential applications can be explored, such as:

- Middle-mile transportation to currently inaccessible regions by conventional modes (road deliveries and light aircrafts) like mountains and remote islands
- Wide-area surveillance and reconnaissance requiring long deployment and constant monitoring
- Urban Air Mobility (UAM) for pilot training and ultra-light aircraft aerial transport
- Shore-to-ship transportation for logistical resupplies
- Disaster response for delivery of emergency medical supplies and services

MARKET TRENDS & OPPORTUNITIES

The global drone industry currently has a market size of $27 billion in 2021 and is expected to be valued at $122 billion in 2032, exhibiting a CAGR of approximately 14.6% during the forecasted period.

UNIQUE VALUE PROPOSITION

This UAV solution integrates the advantages of both conventional drone technologies and conventional aircraft technologies, enabling eVTOL with a fixed-wing aircraft design. This enables vertical take-off and landing in confined spaces without a runway, while also enabling high-speed and long-distance flight similar to conventional fixed-wing airframe design. Additionally, by utilizing an eco-friendly hybrid energy source, it overcomes the low energy density limitations of traditional battery systems and allows for UAV operations independent of separate charging infrastructure.