Horizon
The EU Research & Innovation Magazine

European Commission



Sky high – Europe's first drone cargo airline gets ready to take off

Drones can make air freight cheaper and remote areas more connected. But tracking them will be key.

20 September 2024 - By TOM CASSAUWERS

When brothers Svilen and Konstantin Rangelov first set up a small start-up called Dronamics in their native Bulgaria in 2014, their ambition was to democratise cargo deliveries in Europe and make affordable next-day delivery of packages a reality for even the remotest regions.

Remote access

They had spotted a major sticking point in the global trade system: the absence of rapid and reliable cargo transportation to less accessible parts of the world. This was a gap they believed drone cargo delivery could fill.

"We set out to build a next-generation cargo aircraft so that we could help accelerate trade and enable same-day delivery for everyone everywhere," said Konstantin Rangelov, an aerospace engineer with a keen interest in drones.

Thanks to funding from the EU, the Rangelov brothers fast-forwarded their vision and, in 2022, became Europe's first fully licensed cargo drone airline.

Last year they were officially assigned designator codes from IATA and ICAO – the two main international aviation bodies – granting them recognition on a par with other international airlines.

Europe has more than 2 000 airports, but fewer than 1% of those receive cargo planes. Cargo is today mostly shipped to large airports that can handle jumbo jets.

According to Rangelov, that's a major lost opportunity, and one that drones can solve.

"If we could connect smaller airports and deliver packages there, it would be a boon for economic development in less well-connected regions," he said.

Autonomous cargo delivery

The company has combined advances in autonomy, aerodynamics and production to provide a completely new cargo delivery solution. In May 2023, Dronamics made history when its first full-scale cargo drone, the Black Swan, successfully completed its first flight.

The fixed-wing remotely-piloted aircraft can carry 350 kilograms of cargo, the same as a small delivery van, and has a range of 2 500 kilometres, enough to connect most of Europe. It can also land at the smallest airports imaginable, requiring only 400 metres of runway.

“If we wanted to, we could even land it in a car park,” said Rangelov.

The first drone ports will be built in the Mediterranean, with plans to expand across the EU to serve remote or underserved communities.

Sustainable mobility

But why do we need cargo drones? Can’t we just use existing small aeroplanes piloted in the regular fashion? According to Svilen Rangelov, that option is too costly.

“Piloted aeroplanes are much more expensive,” the Bulgarian CEO said. “In a small plane, the pilot takes up a third of the weight. That’s a lot of space for freight that you lose. Besides, there’s currently a shortage of pilots.”

The savings are substantial. Dronamics will be able to carry out international same-day deliveries for up to 50% lower cost than traditional air freight, with up to 60% lower CO_2 emissions.

Its drones can run on standard as well as biofuels, and the company is working towards building a hydrogen-powered version. According to the engineers, the drones are also more affordable to produce and run than alternatives.

The mid-term goal for the company is to operate their drone fleet from their global operations centre in Malta using a network of drone ports across Europe and beyond. While there has been some attention in recent years to the use of drones for last-mile delivery of parcels, Rangelov said this is not the priority.

“The problem for cargo delivery isn’t the last mile. It’s getting the packages to less well-connected places,” he said.

With an eye on sustainability, Dronamics is also part of a select group of companies taking part in a European Future Mobility task force advising the EU on its Sustainable and Smart Mobility Strategy, which sets out how the EU transport system can achieve a green and digital transformation.

Safety first

One of the things that has held up the widespread commercialisation of drone parcel deliveries so far is concern over safety. Our airspace could soon get very crowded and the locations of drones need to be tracked correctly to avoid collisions, but also for legal reasons.

This is a concern being addressed by Alberto Mennella, innovation manager at TopView, an Italian unmanned aircraft systems engineering company that specialises in the integration of drones in business activities inside very low-level airspace.

TopView is leading an international research initiative called CERTIFLIGHT, that has developed a device which can securely track where a drone is located by satellite. This information will be shared with nearby aircraft, as well as with authorities and drone operators’ customers.

Funded by the EU, the CERTIFLIGHT consortium involves commercial and research partners in Belgium, Czechia, Italy, the Netherlands, Romania and Spain, and will conclude in April 2025.

Receipt of delivery

As well as safety, the CERTIFLIGHT research team is also concerned about ensuring secure delivery.

“If we are going to have drones deliver packages, we want a legal guarantee that they are delivered correctly,” said Mennella, who has made a career of his passion for drones.

For drone delivery to work, it is necessary to have an accurate location for where the drone landed, which can prove that the cargo was delivered to the right place. But criminals may be able to manipulate location data to intercept deliveries, using a technique called ‘spoofing’.

CERTIFLIGHT uses the EU’s Galileo open service navigation message authentication (OSNMA) to mitigate risks from spoofing and jamming and provide location and timing authentication.

“We worked in the laboratories of the EU’s Joint Research Centre in Italy,” said Mennella. “There they have equipment that generates spoofing patterns. By working with them, our software learns to recognise when spoofing happens.”

Later this year, CERTIFLIGHT will take its technology out of the lab, with flying tests planned in October, where they will track the flights of drones. If those are successful, the next step would be for CERTIFLIGHT technology to be placed on drones by manufacturers or operators.

Unclogging supply chains

In the meantime, Dronamics is gearing up for the launch of commercial operations. They expect to start in Greece, connecting the capital Athens to remote areas in the north of the country and some islands in the Aegean.

In the meantime, they are also working on plans for scaling up their production, with facilities that could produce 300 of these drones per year – an expansion that is also being supported by the EU.

The intention is to rapidly expand operations across the Mediterranean and Europe with customers in e-commerce, parcel and post, perishables, pharma and spare parts.

Dronamics are also eyeing emerging economies. Rangelov believes that improving supply chains could provide the conditions for an economic boom in regions like Africa.

“Research shows that supply chains have a massive impact on economic development, much more than, say, development aid,” he said. “It’s like unclogging the veins and arteries of a country’s economy. Our drones will allow them to do that.”

Research in this article was funded by the EU’s Horizon Programme including, in the case of Dronamics, via the European Innovation Council (EIC). The views of the interviewees don’t necessarily reflect those of the European Commission. If you liked this article, please consider sharing it on social media.

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- CERTIFLIGHT
- EU transport research and innovation
- Strategic Transport Research and Innovation Agenda (STRIA)
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