

Press Release

Drone delivers Corona tests from Munich's Theresienwiese to laboratory in less than seven minutes

Quantum-Systems GmbH tests transport of human medical samples via drones for timely results.

Gilching, Deutschland, June 4th, 2020. The physician in protective clothes inserts the swab into the tube, asks the older man a few specific questions and marks the note "urgent sample".

Last week Quantum-Systems GmbH and the laboratory Becker & Kollegen tested the transport of samples, by drone, from the mobile corona test station on the Theresienwiese to the Munich laboratory.

Timely results may have major influence on chain of infection

Urgent samples must be delivered to the laboratory as quickly as possible. This is the case, for example, when a timely test result has a decisive influence on the choice and success of therapeutic measures for a patient. In the event of a pandemic, a few hours may have a major influence on the development of the chain of infection. "I am concerned about the individual behind each sample and the well-being of the patient in terms of the quality and speed of the findings," says Marc Becker, M.D. "In this particular case, however, it is also about reducing risks for the many people involved in the provision of our laboratory services, such as doctors, courier services and assistants."

Transport by drone is 8 to 12 times faster

During a test flight, the autonomously operated Trinity F90+ drone from Quantum-Systems transported 20 sample tubes in less than seven minutes over the 6.4 km¹ flight distance from Theresienwiese to the laboratory in Frühlichstraße. According to the statement from a courier driver who regularly makes the ride between the test station and the laboratory, it often takes an hour or more to travel by van under normal Munich traffic conditions. He has rarely carried more than 15 urgent corona (SARS-Cov-2) test samples. The advantages are obvious: transport by drone is 8 to 12 times faster, emission-free and virtually noiseless. Robert Hirt, Chief Digital Officer, laboratory Becker & Kollegen says: "As part of our vision of a No-Touch Sample Distribution (NTSD), our initiative with Quantum-Systems makes an important contribution to the discussion on how we can use automation and digital technology to further reduce analog touch points and the associated potential danger to humans".

¹ Approximately 4 miles

Drone technology is ready for autonomous missions yet limited by regulations

Putting such a project into practice is easily possible with the technology of Quantum-Systems. From the very beginning, the drones of the Munich-based company have been developed in such a way that autonomous missions can be scaled at any time. To connect the drones on their flights in real time with the cloud and customer-specific Enterprise Resource Planning (ERP) systems, Quantum-Systems relies on software solutions from Auterion. Auterion is a global company with which Quantum-Systems has been working closely together for this purpose since February 2020. The regulations to be considered for such missions are currently extensive in Germany. The approval procedure in the run-up, which has not yet been digitized, is very complex. The responsible aviation authority issues an individual permit only after a detailed risk analysis has been submitted. In addition, permission for take-off and landing must always be obtained from the respective property owner. For each individual BVLOS flight (beyond visual line of sight flight), an additional inspection certificate must be obtained. Due to these conditions, such projects are currently not economically executable in Germany.

Quantum-Systems is able to fulfill requirements for transport of medical payloads

Quantum-Systems already has experience in transporting very sensitive medical payloads by drone, for which further strict requirements must be met.

In South Africa Quantum-Systems delivers its technology for the BloodWing project of the South African National Blood Service (SANBS). The TRON type drone transports blood bags from blood banks to remote hospitals - and this way saves lives, since in an emergency the blood bags can be delivered to their destination faster than by land. To do so, one must comply with the respective legal requirements for the transport of drugs or medicine. For example, the transport box must fulfill certain hygienic and climatic demands. In addition, the transport must be secure and completely traceable, access to the box must be possible for authorized persons only. These are requirements that Quantum-Systems already fulfills.

German Federal Ministry of Transport recognizes potential in drones for new business areas

In order to further advance the technological innovation in the use of drones for medical purposes, Quantum-Systems is currently participating in the tender for a project funded by the Federal Ministry of Transport and Digital Infrastructure (BMVI). Subject of the investigation is how changes in drug logistics can lead to significant cost reductions for hospitals. Quantum-Systems has already been awarded a research contract for another BMVI funding project called "FreeRail". "Free Rail" involves the automated recording of vegetation near the track and storm damage along Deutsche Bahn's rail network using the Trinity F90+ drone. In order to comply with the prescribed road safety obligations, the vegetation along the entire rail network must be inspected, documented and evaluated by qualified personnel at least once a year. At the same time, rail traffic should not be disrupted during inspection. The Trinity F90+ drone from Quantum-Systems GmbH is a decisive component of the technological solution. The drone takes off and lands fully automatically from a self-sufficient drone port, which will be permanently stationed close to the railway line. Using a special communication and data processing system, the collected data can be automatically evaluated. The result is then transmitted to the responsible employee of DB Fahrwegdienste GmbH. The project offers Quantum-

Systems the possibility to collect and evaluate experiences with autonomous BVLOS flights under real conditions.

How to maintain a pioneering position in the drone market

The expectations of all parties involved in above mentioned projects are high: the insights gained are intended to drive forward developments for everyday life and secure Germany's pioneering position in a dynamic, innovative, and increasingly competitive market in the future. Florian Seibel, CEO, Quantum-Systems GmbH: "For us, the development of the Drone Port is a logical step towards the automation and digitization of flight missions. In the end, the drone will transmit information and data for further decision making. With our technology, we deliver this information just in time."

On May 13th, 2020, Federal Minister of Transport Andreas Scheuer presented his drone action plan at a press conference. Targeted funding shall further develop the drone technology in Germany. The legal framework and any necessary changes in legislation and regulations are also part of the BMVI's consideration. It is hoped that the EU drone regulation expected for the beginning of 2021 will create noticeable new scope for action.

When looking at time-critical transport for medical purposes, the benefits of reliable drones are hard to deny. If the technology is to be used in everyday life, the next step would be to overcome hurdles in legislation and the regulatory authorities.

About Labor Becker & Kollegen

Labor Becker & Kollegen is a regional provider of high-quality and value-oriented laboratory medicine, covering the entire spectrum of laboratory diagnostic examinations. The laboratory's special features include the immunohematology department with blood depot and one of the largest screening laboratories in Germany for congenital metabolic diseases. The laboratory was founded in 1979. Since then we have been a successful owner-managed company with over 500 employees at nine Bavarian locations. As a service provider, we are a successful partner for physicians in private practice, hospitals and university institutions, for whom reliability, precision and speed are top priorities. In this way, we ensure our customers the decisive advantage in patient care.

At our locations in Munich and Bamberg, the laboratory has performed more than 130,000 verifications for COVID-19 requests by the beginning of May 2020. The samples from the Theresienwiese in Munich are also analyzed here and findings are transmitted electronically and promptly directly to the physicians and patients who send them in.

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About Quantum-Systems GmbH

Quantum-Systems GmbH, founded in Munich in 2015, specializes in the development and production of automatic transition aircrafts for a wide range of professional and civil applications. The more than 65 employees (growing) work intensively on combining reach and electrical efficiency with the ability to vertically take off and land without additional equipment.

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