Nokia drone networks
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- a complete aerial insights solution for business needs and mission critical situations
Introduction to aerial insights
The use of unmanned aerial vehicles (also known as UAVs or drones) is increasing rapidly among both professionals and amateurs. In response, authorities are developing legislation to regulate the use of drones, encourage pilots to operate them responsibly, and spur manufacturers to adhere to certain quality standards.

Drones can be equipped or enhanced in many ways – such as with the addition of cameras or sensors – to provide views from above and collect data that can be analyzed for meaningful information. These aerial insights are accessible to a wide range of user groups as drones are cost efficient to operate. For example, search missions with thermal camera equipped drones are less costly compared to using helicopters.

With the addition of a remote-control center on the ground, drones are typically part of what is known as an Unmanned Aerial System (UAS), which should also include a reliable communication system.
More than a drone - a complete solution
Whereas single hand operated drones equipped with video cameras are sufficient in many situations, Nokia drone networks is a much more comprehensive solution. Our solution connects and controls an automated fleet of drones over 4G/LTE, with emergency and safety features that include the ability to manually override controls.

Nokia’s drone solutions are focused solely on professional use, where a complete system is best for business and mission critical needs. Our end-to-end UAV environment runs on an optimized Nokia private LTE network with a cloud-hosted packet core. We have chosen LTE for this due to its renowned reliability and security. The UAVs in Nokia drone networks can be equipped with a variety of customizable sensors and on-board processing capabilities. Any data collected is securely and confidentially processed on a multi-tier platform: on-board the drone itself, in the UAV control center and in the Nokia cloud. The drones in our network can be operated in real time or scheduled to perform automated flights for surveillance or monitoring.
The LTE controlled and connected drones can use the in-built handover capabilities of LTE to extend their operating range, while maintaining high-speed broadband connectivity for real-time data streaming from their sensor banks. To cater to the requirements of different use cases and the need for extended mission times, Nokia drone networks UAVs can fly for extended periods of time and beyond line of sight. With this capability, our solution is an ideal platform for the aerial insight needs of various industrial, agricultural, smart city and public safety organizations. It is also able to deliver industrial scale UAV-rescue capabilities such as the Nokia Saving Lives initiative (see page 10).
Business and mission critical
Critical systems have only a minor degree of tolerance for failures. For this reason, the Nokia drone networks solution runs on LTE: the most reliable and secure widespread telecommunications system ever developed.

Nokia’s solution meets the requirements for mission-critical systems in multiple areas, including for example:

- The analysis of visual data feeds to identify anomalies in the behavioral patterns of traffic, crowds and pinpoint over-heated sections of production facilities
- On board sensors and analytics capabilities that can reveal hazardous gases and changes in weather conditions that may affect traffic.
- Edge cloud computing enables rapid data processing for applications that cannot tolerate delays
- Suspended cables and oil pipelines must be inspected regularly in extreme conditions and after harsh weather events. Our programmable drones support maintenance personnel by informing them about the type of repairs needed
- With drones as transport vehicles, injured people can receive first-aid kits and hospitals can receive deliveries of medicines quickly and cost-effectively
- Natural catastrophes and human conflicts may impose dangers on roads, train tracks and other transportation routes. Our eyes in the sky help to identify and prevent such risks from materializing.
During the UAE Drones for Good Award event in Dubai in February 2017, the Nokia Saving Lives project demonstrated how groups of drones flying in formation can efficiently search for people in a disaster area. Drones were connected through Nokia Ultra Compact Network (UCN), the smallest form of a private LTE micro network.

Nokia Saving Lives is based on Nokia drone networks technology, combining LTE technology with UAV applications and enhancements such as real-time, high-definition video and infrared cameras that help emergency response personnel to find and rescue people.

Nokia Saving Lives won the USD 1 million 1st prize in the International Drones category.
We create the technology to connect the world

**Personalize to your needs**
The Nokia drone networks solution will allow customers to select from a portfolio of customizable LTE controlled and connected UAVs with versatile equipment to support many different purposes. Multi-tier processing capabilities bring flexibility and ensure real-time optimization.

**Come fly with us**
Get in touch for a presentation and to discuss how you can benefit from Nokia drone networks and private LTE.

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About Nokia
We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing.

From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in virtual reality and digital health, we are shaping the future of technology to transform the human experience.

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