GSMA 5G Case Studies

5G DRONES COULD KEEP PORTS OPERATING SMOOTHLY

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M1 AND PARTNERS SUCCESSFULLY TRIAL 5G SA CONNECTED DRONES WITH THE MARITIME AND PORT AUTHORITY OF SINGAPORE

Operator partner: M1, Infocomm Media Development Authority (IMDA), Maritime and Port Authority of Singapore (MPA) and Airbus ● **Technologies:** 5G ● **Country:** Singapore

Connected drones could play a key role in enabling port authorities to manage their operations and respond to any incidents. In Singapore, mobile operator M1 is working with the Infocomm Media Development Authority (IMDA), the Maritime and Port Authority of Singapore (MPA) and Airbus to trial 5G-connected drones.

As well as supporting air traffic management, the 5G connectivity can be used to relay video images in near real-time from the drone to a nearby server where video analytics software can be used to monitor the port operations and detect any issues or problems.

In 2020, the four parties began conducting trials on the Singapore Maritime Drone Estate, with a view to developing an open, inclusive and innovative 5G ecosystem around urban air mobility in Singapore. The group are using a 5G standalone (SA) network to enable drones to operate safely and efficiently during all phases of their flights. The 5G SA network is designed to provide secure wide-area connectivity, especially in low-altitude and urban environments where the existing aeronautical communication systems are less effective.

"With 5G, operators have the ability to overlay more value added functionalities, such as providing near real-time features that will work in tandem with video analytics," says Willis Sim, Chief Corporate Sales & Solutions Officer of M1. "It also provides faster response in surveillance by drones, and videos will be less jittery and much more seamless. With Wi-Fi, there is limited coverage and it is not best suited for outdoor usage. 4G, on the other hand, offers indoor and outdoor coverage support, but with lower bandwidth thus which might lead to jitter and buffering issues when managing large scale drone operations."

For the trial deployment, M1 collaborated with TeamOne Technologies Pte Ltd, a local enterprise, to design and develop the world's first aeronautical certified 5G SA communication modem for urban air mobility operations. "Prior to this use-case, there was no aeronautical and maritime certified standalone 5G modem available anywhere in the world," says Willis Sim. "Without certification, there is no guarantee of the reliability of a modem."

M1 will also assess the use of 4G and 5G technologies to provide the drones with enhanced geo-location positioning information, which is more precise than that generated by global navigation satellite systems (GNSS).

M1 says the trial has helped it better understand the standards, feasibility and specific requirements of 5G for urban air mobility applications. The development of a certified 5G SA modem also paves the way for the safe adoption of 5G to support unmanned aircraft designs and operations.

The trial employed "an innovation model that allows for development, testing and benchmarking of 5G-enabled solutions that can eventually be applied across various industries, and will do a great deal to imbue M1's team with the necessary experience and expertise for 5G deployment," adds Willis Sim. "It will also inform existing and future use cases that will further M1's position in the forefront of 5G development for enterprises." Following the encouraging results from the trial, M1 is working closely with its partners towards commercial deployments.
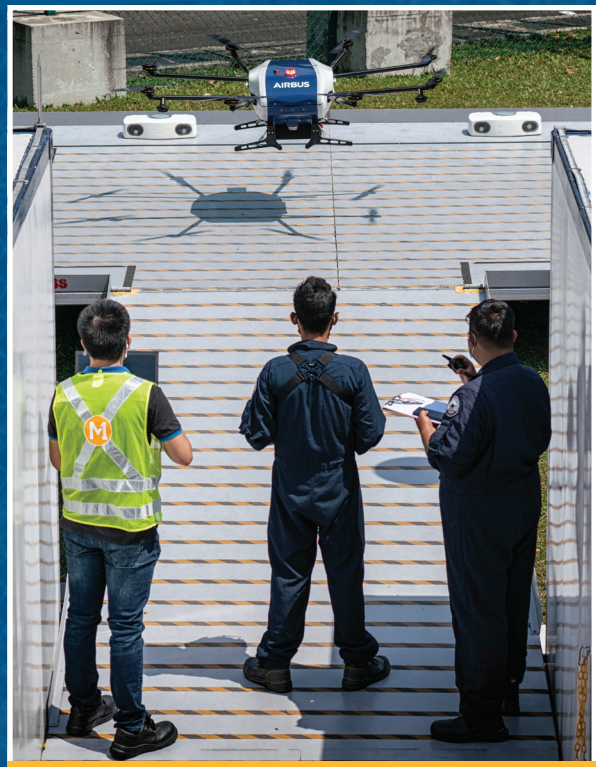
STANDALONE 5G OFFERS AN IMPROVEMENT IN PERFORMANCE

M1's 5G SA network was launched for consumer usage in July 2021. It says the network supports 10x faster speeds and 50% more responsiveness than a 4G network, allowing many more devices to be connected without any reduction in speed or quality. "This means that a higher influx of traffic is no longer a problem, and consumers can enjoy an extremely smooth mobile connectivity experience anywhere, anytime," says Willis Sim. "Together, these benefits also enable a range of innovative and diversified digital experiences — from 5G cloud gaming, to real-time streaming and entertainment; and from immersive augmented reality (AR) to virtual reality (VR) applications."

As well as launching 5G SA, M1 has integrated all of its back-end systems onto a cloud-native digital platform. It says this new architecture has significantly enhanced the scalability, evolution and performance of its systems. "Importantly, it allows us to unleash the full potential of 5G by using 5G SA's cloud native architecture to create and provide superior services to customers and businesses," adds Willis Sim.

M1 believes 5G SA could "be a game-changer" for a wide range of industries. It is now exploring potential applications through use-cases with key partners. "We are already making good progress with the 5G SA rollout," says Willis Sim. "We are already working on a range of both B2B and B2B2C cases — ranging from manufacturing to robotics and even 5G-based ATMs — which will not only drive monetisation for us, but will create significant value for businesses, as well as end-consumers."

M1 provides a suite of managed applications and solutions – tapping the Internet of Things, big data analytics and video analytics - to support enterprises. With the faster network and increased responsiveness, 5G is the enabler for cloud based IoT applications. Having begun 5G trials as early as

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2018, M1 has developed more than 15 5G use cases and trials across consumer, enterprise and government sectors. The operator is involved in an Industry 4.0 5G trial partnership, with IBM, IMDA and Samsung to develop, test and rollout smart manufacturing processes. The joint project is trialling a combination of 5G and AI for image recognition and video analytics; improved equipment monitoring and predictive maintenance using AI-enabled acoustic insights; and assembly and debugging using AR to improve productivity and quality.

In 2021, M1 also began working with Continental Automotive Singapore and JTC Corporation to trial the use of 5G SA to enable autonomous mobile robots to handle last mile deliveries of goods and food.

"One of the major factors that has promoted the growth and development of 5G in the Asia Pacific region is the support from strong and forward-looking regulatory bodies," says Willis Sim. "Singapore's government and local regulators have been proactively encouraging the adoption of new technologies, which fosters the growth of an innovative 5G ecosystem."

Currently, M1 and Keppel Digi are collaborating with Keppel Offshore & Marine (KOM) on the 5G Industrial use cases including wearables to enhance workforce safety and health monitoring, smart video analytics and real-time asset monitoring. There are more pilots in the pipeline which aim to transform the current yard processes into digital-based processes to drive towards greater efficiency, safety and productivity aligning with KOM's digitalisation journey.

ABOUT M1

M1, a subsidiary of Keppel Corporation, is Singapore's first digital network operator, providing a suite of communications services, including mobile, fixed line and fibre offerings, to over two million customers.

Since the launch of its commercial services in 1997, M1 has achieved many firsts – becoming one of the first operators to be awarded one of Singapore's two nationwide 5G standalone network license, first operator to offer nationwide 4G service, as well as ultra high-speed fixed broadband, fixed voice and other services on the Next Generation Nationwide Broadband Network (NGNBN).

M1's mission is to drive transformation and evolution in Singapore's telecommunications landscape through cutting-edge technology and made-to-measure offerings. For more information, visit www.m1.com.sg