

NOKIA



Private wireless networks for digitalized Oil and Gas operations

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Pervasive. Resilient. Secure

Solutions
4.0 you
@nokiaindustries

Constantly changing business conditions and increasingly stringent environmental regulations are driving Oil and Gas companies to work in more efficient, responsible and sustainable ways. To deliver on their goals — and even expand into the renewable energy market — they need to start by transforming their operations.

Digital transformation and automation can deliver significant rewards for companies across the industry's value chain. Advances in the Industrial Internet of Things, Artificial Intelligence, Machine Learning and Augmented and Virtual Reality make it possible to improve decision making, drive autonomous operations, track assets and monitor processes to ensure safe conditions.

In fact, natural resources industries rely on effective communications for safer, more productive and efficient operations across the supply chain, from onshore and offshore platforms to the petrol pump and covering pipelines, refineries and storage tanks.

Nokia Private Wireless networks enable energy companies to digitalize and automate operations and prepare for the future. Our solutions accelerate their Industry 4.0 journey and help them sustainably and responsibly transform their business.

Private Wireless networks are how Oil and Gas digitalization happens

Robust, pervasive and predictable wireless voice and data connectivity is the key to making Oil and Gas automation work. It enhances critical communications and enables a new breed of smart digital applications that can optimize operations.

Right now, many digitalization efforts are held back by aging communications networks that don't provide the necessary coverage, reliability, mobility, precision or service prioritization. Wi-Fi, TETRA and P25-based radio networks simply weren't created to cater for the demands of ultra-broadband and mission-critical use cases, video communications and the massive data footprint of industrial IoT sensors and devices.

Mature 4.9 LTE technology already enables 85% of industrial use cases as well as offering an easy upgrade to 5G, alongside access to a wide range of compatible devices. For business-critical and mission-critical industrial use cases with immense demands for reliable low latency and high capacity, 5G standalone (SA) is your best choice.

	Wi-Fi 5/6	TETRA P25	LoRaWAN BLE	Bluetooth BLE	4.9G/LTE 5G SA
High data-rate, low latency	✓	✗	✗	✗	✓
Mission-critical	✗	✓	✗	✗	✓
Cyber-secure	✗	✓	✗	✗	✓
Predictable performance	✗	✗	✗	✗	✓
Coverage	✗	✗	✓	✗	✓
Fast mobility	✗	✓	✗	✗	✓
LP-WAN (IoT)	✗	✗	✓	✓	✓
MC Voice	✗	✓	✗	✗	✓
Single tech, for all use cases	✗	✗	✗	✗	✓

Technology enablers for digital automation



Fast, reliable, and secure mobile data connectivity



Mission-critical voice and video communications



Real-time video streaming



Low-latency communications for extreme autonomy and automation



Sensor networks, IIoT



Data analytics and AI



Cloud and edge computing



Asset monitoring and predictive maintenance



Geo-location, geo-tracking and geo-fencing



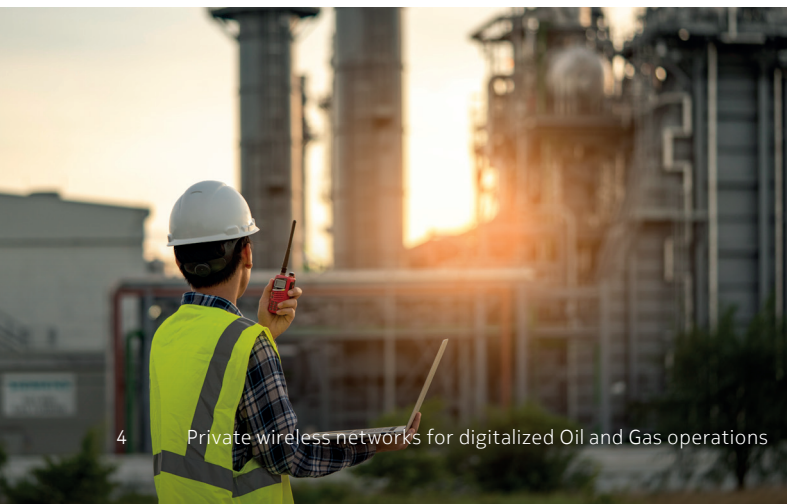
Robots and drones



Augmented and Virtual Reality



Digital twin



Safer, more productive and efficient operations

Nokia private wireless solutions provide a robust, flexible and predictable network infrastructure which can support a variety of use cases across the value chain – from onshore and offshore, and upstream, midstream and downstream.

Search and prospection: Set up a portable LTE configuration in minutes to provide high-bandwidth mobile connectivity for sensors, field workers and drones in even the most remote locations.

Drilling and extraction: Supplement automation by enabling personnel to monitor automated processes and operate machinery at a distance using virtual telepresence.

Inspection of facilities: Use robots and drones to remotely inspect offshore sites, wellheads, pipelines, storage tanks, platform parts, areas subject to corrosion and complex or hazardous access points.

Plant automation and production chain optimization: Gain digital insights through higher data transparency, deliver the benefits of real-time planning and stay agile.

Shutdowns and turnarounds: Keep your project on-schedule and on budget by avoiding shutdowns, turnarounds and outages (STOs). Cover the entire facility and provide reliable connectivity to contractors, project teams and plant management.

Situational awareness and worker safety: Improve safety, sustainability, and security with smart personal protective equipment (PPE), environmental sensors, video monitoring and geo-fencing services.

Mission-critical voice and video communications: Keep workers safe and connected with advanced push-to-talk (PTT) and push-to-video (PTV) services with features such as a panic button.

Predictive maintenance using IoT and analytics: Leverage pervasive wireless coverage to collect data from IoT sensors, feeding asset management and advanced data analytics applications.

Digital twins and AR/VR: Maintain an up-to-date digital model of the physical environment using data from sensors, cameras, drones and location-aware mobile devices. AR/VR systems and applications can then use this model to provide staff with real-time information, scenario simulations and instructions.

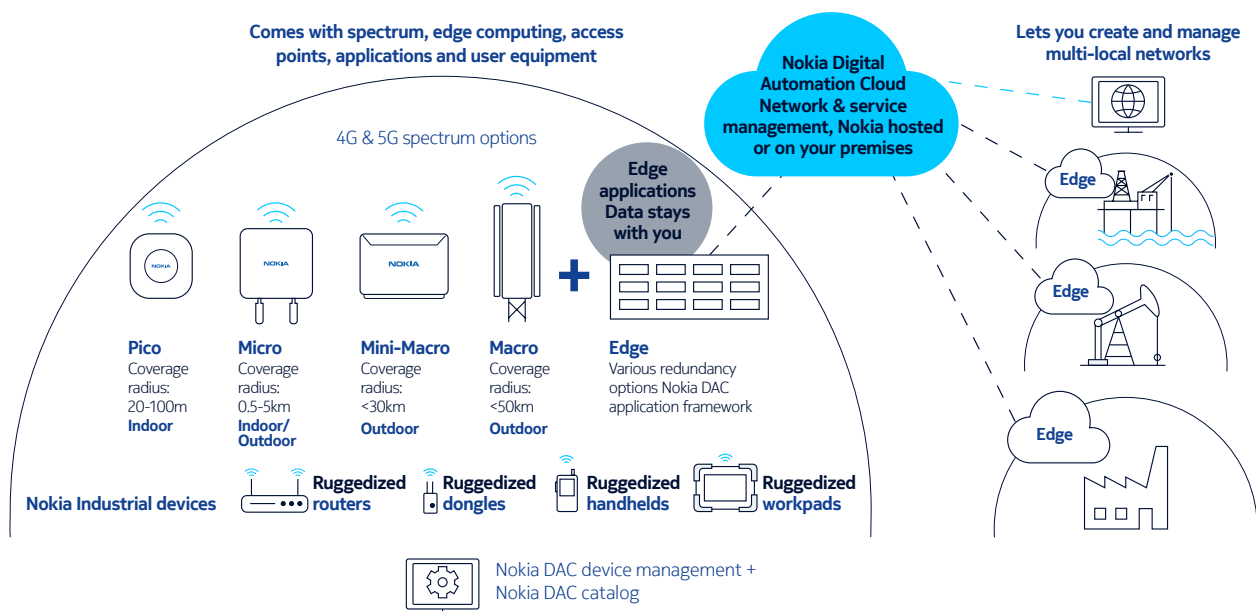
Nokia Digital Automation Cloud

Nokia Digital Automation Cloud (DAC) is a high-performance, end-to-end private wireless networking and edge computing platform designed to meet the mission-critical needs of the most asset-intensive industries with an easy to deploy campus-style network.

Offered as a service, Nokia DAC combines reliable high-bandwidth, low latency 4G/5G connectivity with local edge computing capabilities and a catalog of 'click and deploy' applications. Add in our portfolio of ruggedized Nokia Industrial user equipment and whatever your industry or use case, we've got you covered.

Nokia DAC comes with edge computing hardware, radio access points, add-on applications and user equipment. It also comes with spectrum options – unlicensed (MulteFire and Nokia DAC unlicensed), shared (CBRS) or licensed spectrum – giving you secure, pervasive indoor and outdoor connectivity.

Whether you prefer a planned migration starting with 4.9G/LTE, or go direct to 5G SA, we're happy to share and help you build on the experience of our many enterprise customers worldwide who are powering their digital transformation with Nokia DAC private wireless solutions.



Nokia DAC gives you:

- An easy to deploy industrial-grade private wireless network
- High reliability with proven 4G/LTE, 5G SA and MulteFire technology
- Simple plug-and-play connectivity for all your assets
- Full control over the creation and management of multi-local networks
- Low latency and strong security
- Wide and deep coverage
- Dependable QoS management
- Easy scalability, up and down
- A rich portfolio of ruggedized industrial devices
- A growing catalog of Nokia and partner applications
- An ecosystem of industry-leading companies, solution providers and other key players

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About Nokia

We create technology that helps the world act together.

As a trusted partner for critical networks, we are committed to innovation and technology leadership across mobile, fixed and cloud networks. At Nokia.com We create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Adhering to the highest standards of integrity and security, we help build the capabilities needed for a more productive, sustainable and inclusive world.

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