BUZZWORD DEMYSTIFIER

5G

5G is the buzzword on everyone's lips. This new technology promises great things – but what are these things? And is 5G not just 4G made a little speedier? No, it is quite definitely not. In fact, it is hard to overstate the impact 5G will have on the industries with which ABB is involved.

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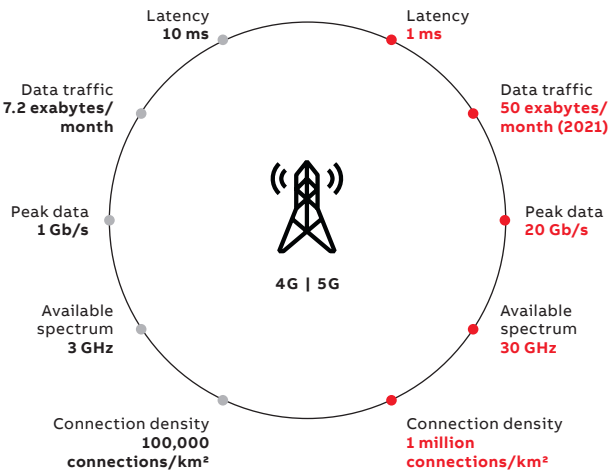
With the world depending ever more on connectivity and the exchange of data, the communications industry is moving to provide an entirely new type of wireless network: 5G, the fifth generation of cellular communication technology. With, for example, the ability to serve many devices nearly simultaneously and even run different logical networks for autonomous driving, voice and industrial applications on one physical infrastructure, 5G is a key ingredient for the digital transformation of industries.

This performance improvement is needed to accommodate the current megatrend of digitalization. Apart from the consumer applications of 5G, the technology is vital for vertical industries looking to improve competitiveness by deeper integration of value networks, operations processes and production equipment. More than ever, automation systems are expected to enable flexibility, increase productivity and decrease operational risk for their owners. There are three key aspects of 5G performance that make it able to do this:

- Enhanced mobile broadband (eMBB) increases bandwidth by an order of magnitude over 4G – ideal for, say, high-definition (HD) video-streaming or augmented reality (AR).
- Ultra-reliable low-latency communication (URLLC) reduces latency and enhances the reliability of communication. URLLC targets process- and safety-critical applications like closed-loop process and motion control, safe communication and autonomous logistics with automated guided vehicles (AGVs).
- Massive machine-type communication (mMTC) aims to increase the number of devices in a given area by orders of magnitude. This aspect of 5G is primarily aimed at sensor applications with low data rates but high spatial density.

In practice, applications demand a combination of these performance features. A good example is the streaming of augmented-reality content, which requires both high bandwidth for content itself but also low latency to prevent motion lag – if the delay between head-motion and the AR image is too great, the technology becomes unusable in the field. Similarly, closed-loop control applications require both a high density of sensors and high reliability (but rather low data rates).

Beyond the mere improvement of protocol performance described above, 5G cellular ecosystems offer automated industrial systems scalability, sharing of networks between applications (eg, autonomous driving and autonomous plants could share a 5G network) and wide-area precision time synchronization. 5G will incorporate low-power and low-data-rate protocol variants



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01 5G has a performance about 10 times better than that of 4G. 5G can address the needs of a converged digital ecosystem of verticals, from distributing power to automating smart cities with their plants, factories, utilities, roads, commercial and residential buildings.

that support vastly increased device densities and flexible positioning of sensors, machines, or production modules.

5G also helps to improve productivity. The ability to reliably add and connect sensors without added infrastructure cost delivers added insight into processes and products that can be used by machine-learning algorithms to predict and prevent system downtime and quality issues.

Making 5G a reality

5G is a complex yet versatile communications ecosystem that incorporates a range of different radio technologies, wire-bound wide-area networks, powerful computers and a significant amount of intelligent software functions. 5G surpasses by far the performance of existing communication technologies for industrial applications.

Today, cellular technology is already a part of many ABB products. To exploit the 5G opportunities ahead, ABB partners with world-leading companies to drive standardization, regulation and technology development of 5G. The new products emerging from that work will radically change the face of industrial automation. •

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