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IoT and 5G – The perfect combination

The IoT (Internet of Things) has been around in business for a long time. But now, thanks to the new 5G mobile communications standard, it is able to tap into its full potential. You can find out what opportunities this opens up for the electronics manufacturing industry "live" at productronica 2021 from November 16-19 in Munich. VDMA Productronic acts as an ideal partner for the event.

The Internet of Things (IoT) can't be slowed down – not even by the coronavirus pandemic. IoT remains one of the fastest growing technology sectors. The market research firm Statista therefore expects that there will be nearly 31 billion IoT devices online by 2025. Other estimates predict more than double that amount.

According to Market Research Future, the global market for IoT in manufacturing alone is to grow to USD 751.3 billion by 2023, with a compound annual growth rate (CAGR) of 24 percent. Grand View Research predicts a global market volume of USD 1.11 trillion in the sector by 2028. The reasons for the analysts' optimistic outlook include advancing automation, predictive maintenance and supply chain management.

The IoT study from Computerwoche and CIO highlights this trend: 44 percent of the industrial businesses surveyed stated that they had increased their IoT budget during the pandemic. The funds primarily went toward quality control and logistics, followed by networked production systems and intelligent products.

More IoT thanks to 5G and 6G
Thanks to the new 5G mobile communications standard, there is now a significant expansion to the range of applications, not just in the industrial

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setting, but also in the areas of energy, health, science and consumers. With high bandwidth, strong transmission performance and low latency, in many areas 5G represents the technical foundation for the next stage in the development of IoT.

However, this basis is not perfect. Researchers and companies are already beginning to prepare the next 6G mobile communications standard. This appears to achieve the things that were promised by 5G, according to an interview by Ivan Ndip from the Fraunhofer Institut IZM. 6G is to once again significantly increase the performance of mobile communications in terms of peak throughput, users' data rates, reliability, latency, as well as energy efficiency and precision of localization. The use of terahertz frequencies from 100 GHz therefore allows for data rates up to a terabit per second and latencies of around 100 microseconds – fifty times the data rates of 5G and a tenth of the latency. All with a much higher concentration of connections (devices per square kilometer). Here, 5G can "only" support up to one million networked IoT devices in an area of one square kilometer. 6G increases this tenfold.

Semiconductor market benefits from IoT and 5G
The rapid growth of networked IoT devices therefore demands not only more and more semiconductors, but also increasingly high-quality components for them. This applies to all industry segments and IoT relatives (IIoT, IoMT, AIoT, etc.).

As such, IoT analytics expects the IoT semiconductor market to increase from USD 33 billion (2020) to USD 80 billion by 2025. The focus is on IoT microcontrollers (MCUs), as well as chipsets for IoT connectivity, IoT AI and IoT security.

However, the lion's share goes to IoT connectivity chipsets, with 35 percent. Here, cellular IoT chipsets are now playing a leading role. For this segment, IoT analytics expects a CAGR of 37.5 percent between 2020 and 2025, driven by 5G and "Low Power Wide Area" (LPWA).

Yet, according to analysts, the IoT semiconductor market is still in its infancy. This is expected to change in the years to come. The share of IoT-specific semiconductors will increase from 7 to 12 percent between 2019 and 2025. The Internet of Things is starting to establish itself as a driving force for the semiconductor industry. However, this means that chip manufacturers also increasingly need to meet the typical requirements of IoT, such as ultra-low power, small form factors and integrated security.

productronica 2021, exhibitors on the topic of IoT/5G/6G

iTAC (Hall A3, Booth 161)
iTAC offers MES and IIoT solutions for transparent, automated production processes, and provides various services for the networking, automatization and analysis of manufacturing processes.

Cimetrix (Hall A3, Booth 437)
With the industrial IoT platform Sapience, manufacturers, software developers and OEMs gain access to devices that were previously difficult to connect.

Segger Microcontroller (Hall A1, Booth 174)
Segger delivers complete end-to-end solutions for every IoT scenario that cover all areas from development tools up to standard firmware components.

Orbotech (Hall B3, Booth 320)
The Israeli company distributes new technologies and solutions for manufacturing processes in the field of 5G.

Rohde & Schwarz (Hall A1, Booth 375)
A new family of test devices is tailored to 5G applications in development, type testing and production.

Fraunhofer IZM (Hall B1, Booth 228)
A new generation of thick film paste makes it possible to manufacture extremely high-resolution structures necessary for 5G applications.

Aurel (Hall A2, Booth 481)

The Italian company Aurel develops production systems that are precisely matched to the PI pastes from the Fraunhofer Institute for Ceramic Technologies and Systems.

More information: www.productronica.com

productronica
productronica is the world's leading trade fair for electronics development and production and is supported from a conceptual and technical perspective by the Productronics Association of the VDMA (German Mechanical Engineering Industry Association). 1,544 exhibitors from 44 countries and 44,000 visitors from 96 countries took part in and attended productronica 2019. The trade fair has been held in Munich every two years since 1975 and the next productronica is due to take place from November 16 to 19, 2021. For more information, visit www.productronica.com

productronica worldwide
In addition to productronica, Messe München organizes productronica China, productronica South China and productronica India. The network of electronics trade fairs also includes electronica in Munich, electronica China, electronica South China, electronica India, SmartCards Expo, electronicAsia and LOPEC.

Messe München
Messe München is one of the leading exhibition organizers worldwide with more than 50 of its own trade shows for capital goods, consumer goods and new technologies. Every year, a total of over 50,000 exhibitors and around three million visitors take part in more than 200 events at the exhibition center in Munich, at the ICM – Internationales Congress Center München, the Conference Center Nord and the MOC Veranstaltungscenter München as well as abroad. Together with its subsidiary companies, Messe München organizes trade shows in China, India, Brazil, Russia, Turkey, South Africa, Nigeria, Vietnam and Iran. With a network of associated companies in Europe, Asia, Africa and South America as well as around 70 representations abroad for over 100 countries, Messe München has a global presence.