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Merck KGaA, Darmstadt, Germany, and p-Chip Successfully Implement Joint Solution to Bridge Gap Between Physical and Digital Trust Layers

- **In collaboration, Merck KGaA, Darmstadt, Germany, and p-Chip Corporation are advancing a digital platform combining software and hardware components that allows customers to create digital twins of single physical products and prove their authenticity throughout the product life cycle**
- **The combined solution enables the usage of p-Chip microtransponders as crypto-anchors and facilitates the seamless integration of corresponding reader devices into customers' existing processes, ensuring digital authenticity and trust**

Darmstadt, Germany, November 28, 2023– Merck KGaA, Darmstadt, Germany, a leading science and technology company, today announced the successful integration of p-Chip Corp's, Chicago, U.S.A., microtransponder technology as a crypto-anchor into a cyber-physical trust framework solution that is currently being developed by Merck KGaA, Darmstadt, Germany. This achievement marks an important milestone in enabling the creation of secure digital twins of physical products while ensuring their authenticity throughout their lifecycle.

"We are committed to empowering companies to fully leverage the advantages of the Industrial Internet of Things and develop digital twins of single objects they can really trust. Our solution, in collaboration with p-Chip Corporation, comprises a comprehensive combination of both software and hardware elements. This integrated approach enables our customers to effortlessly develop their individual digital applications, tailored to their unique requirements," explained Thomas

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Endress, Executive Director of EMD Digital at Merck KGaA, Darmstadt, Germany. "By offering a secure and user-friendly platform, our solution ensures seamless interoperability while providing the flexibility and ease of integration that our customers demand."

With its extensive expertise in highly regulated industries such as healthcare, life science, and electronics that require best product quality, Merck KGaA, Darmstadt, Germany, is uniquely positioned to deliver a solution that addresses complex application needs. Joe Wagner, CEO at p-Chip Corporation, added: "We are pleased that the powerful innovations planned through this strategic cooperation are coming to fruition. p-Chip microtransponders play an integral role in the robust digital solution of Merck KGaA, Darmstadt, Germany. As industries leverage blockchain, artificial intelligence, and machine learning to solve complex challenges, p-Chip's digital twin enabling technology delivers the breakthrough levels of visibility, traceability, and security needed for companies to achieve dramatic operational efficiencies and brand security."

The cyber-physical trust framework solution aims to empower companies to harness the advantages of the Industrial Internet of Things (IIoT) with utmost confidence. It securely anchors physical objects to their digital identities, providing a reliable platform for product authentication and trust. The solution combines software and hardware components and seamlessly integrates into existing workflows and processes.

Companies can build their applications on the robust software foundation of the solution which utilizes multiple blockchain layers, crypto anchors, digital certificates, and smart contracts. By establishing a "single source of truth", the cyber-physical trust framework facilitates seamless machine-to-machine communication, empowering ecosystem partners to achieve full traceability and digital trust while retaining control of their data.

Crypto anchors play a crucial role in securely identifying and authenticating physical objects within the cyber-physical trust framework. As a crypto-anchor agnostic solution, various types of crypto anchors are deployed, from conventional QR codes to RFID and high-security options such as the Securalic® security pigments of Merck

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KGaA, Darmstadt, Germany. The latter are of particular importance in highly regulated industries where errors due to incorrect product attribution are a problem. The addition of p-Chip microtransponders offers a highly secure and durable option to address increased security needs. Designed with a remarkably small footprint of only 500x500x100 µm, p-Chip microtransponders utilize a photocell for power and clock pulses, eliminating the need for induction coils or oscillators.

Moreover, the p-Chip microtransponders offer the added advantage of usability in challenging environments where other solutions may be impractical, such as harsh environments that would damage or decompose other taggant solutions. These microtransponders can be directly applied to products including metal, circumventing issues related to label detachment.

Together with p-Chip Corporation, wireless handheld readers have been developed that are designed for seamless integration into existing processes via Bluetooth connectivity enabling portable and hassle-free scanning. The integration of these readers represents a significant milestone, demonstrating that different crypto anchors with their respective advantages can be unified on a single technical platform, offering a harmonized user experience. As a result, customers can choose a combination of technologies that best suits their products and processes.

About p-Chip Corporation
Since 2017, p-Chip Corporation has revolutionized the tracking of physical products and materials with its breakthrough microtransponder technology. Highly durable and small as a grain of salt, its uniquely traceable, light-activated p-Chip crypto anchor functions like a digital twin for physical items. This silicon microchip authenticates goods across the supply chain and enables secure tracking of data through web, cloud, or blockchain applications. From life sciences and healthcare to electronics, automotive components, food ingredients, and more, organizations worldwide look to patented p-Chip microtransponders to securely track chain-of-custody, unlock business intelligence, protect brand and product integrity, and enhance revenue. To learn more, visit www.p-Chip.com.

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About Merck KGaA, Darmstadt, Germany
Merck KGaA, Darmstadt, Germany, a leading science and technology company, operates across life science, healthcare and electronics. More than 64,000 employees work to make a positive difference to millions of people's lives every day by creating more joyful and sustainable ways to live. From providing products and services that accelerate drug development and manufacturing as well as discovering unique ways to treat the most challenging diseases to enabling the intelligence of devices – the company is everywhere. In 2022, Merck KGaA, Darmstadt, Germany, generated sales of € 22.2 billion in 66 countries.
The company holds the global rights to the name and trademark "Merck" internationally. The only exceptions are the United States and Canada, where the business sectors of Merck KGaA, Darmstadt, Germany, operate as MilliporeSigma in life science, EMD Serono in healthcare and EMD Electronics in electronics. Since its founding in 1668, scientific exploration and responsible entrepreneurship have been key to the company's technological and scientific advances. To this day, the founding family remains the majority owner of the publicly listed company.