

News Release

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EMD Electronics Announces Commercial Launch of Liquid Crystal-Based Solution for Smart Antennas

- **Energy- and cost-efficient solution for connectivity even in remote areas**
- **Antennas based on liquid crystal technology enable new era of communication systems**

Darmstadt, Germany, MARCH 29, 2021 – EMD Electronics, a business of Merck KGaA, Darmstadt, today announced the commercial launch of licriOn™, a liquid crystal-based solution for electronically beam-steered smart antennas. licriOn™ technology uses custom-designed molecules with optimized microwave properties to enable a new type of antenna that improves modern data communication. These antennas can easily connect with stationary and moving satellites. The energy and cost efficiency of the liquid crystal-based solution helps achieve extensive connectivity access, even in remote areas where fast Internet connections are unavailable or unaffordable today.

“Fast and reliable Internet access is a key driver for development and progress”, said Michael Heckmeier, Head of the Display Solutions business unit within the Electronics business sector of Merck KGaA, Darmstadt, Germany. “With the launch of licriOn™, we’re demonstrating our commitment to addressing the world’s greatest challenges with our science and technology. By leveraging our liquid crystals expertise in this exciting application field, we are creating new opportunities for those who still lack steady Internet access. We believe in the potential of our smart antenna technology to advance digital living for everyone.”

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licriOn™ based antennas will enable a new era of communication systems

High-performance antennas are an integral part of modern wireless communication systems. Higher frequencies often require antenna beam steering to enhance connection quality between transmitting and receiving stations. In some applications such as satellite broadband with non-geostationary satellites, such antennas are indispensable. The beam of licriOn™ based antennas can be electronically steered into the desired direction without physically realigning the antenna. This is achieved by combining an array of antenna elements with a thin layer of licriOn™ liquid crystal. The liquid crystals can be switched on a molecular level to allow powerful, precise and energy-efficient beam steering.

The advantages of licriOn™ based smart antennas are numerous. They deliver excellent performance while being more compact and requiring less energy. Manufacturing costs of these smart antennas are significantly lower compared to conventional solutions. Moreover, they do not need to be maintained, repaired, or replaced as frequently as their mechanical counterparts. These smart antennas are very flat, they are far more compact than previous antenna generations and they allow a modular design. Therefore, they can be easily integrated into ships, airplanes, and other vehicles almost seamlessly.

Advancing digital living with licriOn™ liquid crystal technology from EMD Electronics

Connecting vehicles, machines or mobile phones even in the remotest corners of the world is possible today thanks to new satellite constellations. However, a new generation of intelligent antennas is required in order to unleash the full potential of these networks. Ubiquitous connectivity calls for versatile, energy-efficient and affordable technology.

licriOn™ is powered by liquid crystals from EMD Electronics. The company has been exploring the possibilities of liquid crystals for over 110 years and is now providing a breakthrough innovation that enables the transmission of large amounts of data and high-speed connectivity. Liquid crystal technology is thus playing an important role in technological megatrends such as 5G, smart cities and future mobility.

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Thanks to its energy efficiency and affordability, it also has considerable potential to improve people's lives in remote areas and less developed regions as the Internet facilitates access to education, business opportunities and social interaction.

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About the Electronics business of Merck KGaA, Darmstadt, Germany

The Electronics business of Merck KGaA, Darmstadt, Germany, operates as EMD Electronics in the United States and Canada. EMD Electronics' portfolio covers a broad range of products and solutions, including high-tech materials and solutions for the semiconductor industry as well as liquid crystals and OLED materials for displays and effect pigments for coatings and cosmetics. Today, EMD Electronics has approximately 2,000 employees around the country with regional offices in Tempe (AZ) and Philadelphia (PA).

Merck KGaA, Darmstadt, Germany, a leading science and technology company, operates across healthcare, life science and electronics. Around 58,000 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 advancing gene editing technologies and discovering unique ways to treat the most challenging diseases to enabling the intelligence of devices – the company is everywhere. In 2020, Merck KGaA, Darmstadt, Germany, generated sales of € 17.5 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 EMD Serono in healthcare, MilliporeSigma in life science, and EMD 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.