Press release

Digital trains: Knorr-Bremse and Nexxiot present connectivity solutions for the rail industry

- **Knorr-Bremse and Nexxiot to launch a suite of smart products for improving connectivity throughout the rail industry**

- **Starting in 2024, Knorr-Bremse Node, Knorr-Bremse Hub and associated cloud services will be available for outfitting and retrofitting passenger and freight trains**

- **Smart analytics of operating data gathered from braking systems and other systems will improve train availability, operational efficiency and punctuality**

- **Key projects are already underway with customers in the UK and USA**

- **Knorr-Bremse expects digital solutions to generate steady growth, achieving Rail division revenues in the lower double-digit million-euro range by as soon as 2025**

Munich, December 11, 2023 – Knorr-Bremse is focused on driving forward the digitalization of the rail sector. Together with Swiss asset intelligence specialist Nexxiot, based in Zurich, Knorr-Bremse is about to bring a new suite of smart products for connected passenger and freight trains to market. With these solutions, Knorr-Bremse is creating the basis for high-growth digital business models in the areas of connectivity, cloud solutions and software as a service.

Dr. Nicolas Lange, Member of the Executive Board of Knorr-Bremse AG with global responsibility for the Rail division: "The rail industry is asking for solutions that will enhance cost efficiency, operational efficiency, and reliability. Digitalization and data management technologies offer enormous opportunities in this respect. With the smart solutions we're presenting with Nexxiot, we're creating a new level of connectivity for our braking and other systems that will help our customers to improve the productivity, availability and punctuality of their rail services."

Stefan Kalmund, CEO of Nexxiot AG: "Together, Knorr-Bremse and Nexxiot are shaping the future of the rail industry. Our partnership will help the industry to achieve the levels of efficiency and reliability that are already taken for granted in other transportation segments. As a key technology partner, Nexxiot is proud to be accompanying global market leader Knorr-Bremse on this pioneering journey."

Dr. Maximilian Eichhorn, Vice President Digital Products at Knorr-Bremse: "In less than 18 months, our focused collaboration with Nexxiot has seen the development of market-ready products for outfitting new train fleets and retrofitting existing fleets. Among other things, we'll be able to leverage the potential of real-time operating data to make precise statements about the condition, performance and maintenance requirements of our systems. This means more trains on tracks and fewer trains in workshops – a major benefit for our customers."

Three-pronged digital solution: new hardware plus smart cloud service
To develop the products, the two partners intelligently combined Knorr-Bremse's systems expertise with Nexxiot's proven competence in IoT. The innovative workflow, which involves collecting operating data, transferring it to the cloud and turning it into useful knowledge, is based on three products:

- **Knorr-Bremse Node:** The adapter is connected to the control units of systems such as braking, entrance, climate control and coupling systems, where it gathers data on parameters such as noise, geolocation, temperature, energy consumption, and shocks or vibrations. Each Knorr-Bremse Node then sends the data by Bluetooth to the second new piece of hardware, the Knorr-Bremse Hub.

- **Knorr-Bremse Hub:** The Hub aggregates the data streams from the Nodes attached to the various system controllers and sends them to the Nexxiot Cloud via the cellular network (in the future, via the rail vehicle's own bus). Thus the Knorr-Bremse Hub acts as the gateway between data nodes and the cloud.

- **Cloud Services:** Artificial intelligence and algorithms are used to analyze the data streams and turn them into specific insights. Customers can call up information on the location, condition, performance, maintenance requirements and potentially imminent malfunctions of vehicle systems and components via user-friendly dashboards – so they can more efficiently plan the operation and management of their train fleets.

Digital solutions for outfitting and retrofitting fleets

The large number of Knorr-Bremse systems installed worldwide is a source of huge business potential for the company. Over 130,000 units of the CubeControl brake control system alone are currently in operation around the world, as are more than 100,000 climate control systems produced by Knorr-Bremse brand Merak. A significant proportion of these systems are capable of being upgraded with the new solutions. When equipping new vehicles, this can be done directly via the systems' control unit software.

Attractive, high-growth business models

Knorr-Bremse will start rolling out the products in 2024, creating the basis for a range of digital business models. Alongside the Knorr-Bremse Node and Knorr-Bremse Hub hardware, customers will benefit from scalable data services enabled by the Nexxiot Cloud ecosystem. These will be provided via subscription models (software as a service) charging a monthly fee, or via pay-per-use models. With these digital solutions, Knorr-Bremse's Rail division aims to generate annual revenues in the lower double-digit million-euro range by 2025 – a figure expected to steadily grow in years to come.

Major customer projects already underway

The new technology is already being used in several customer projects involving predictive maintenance. Examples include the data interface between hardware and the Nexxiot Cloud, currently in use by rail freight operator VTG in the UK. Starting in 2024, 50 freight cars will be equipped with the technology. New York Air Brake (NYAB), Knorr-Bremse's rail freight subsidiary in the USA, has partnered with customers in the U.S. freight transportation sector to install Knorr-Bremse Nodes in brake control systems on freight trains, enabling them to communicate with pre-installed Nexxiot technology. These projects underscore both the innovative character and market maturity of the solutions, customized versions of which will be available starting in 2024.

In May 2022, Knorr-Bremse invested some EUR 60 million in the acquisition of a strategic minority stake in Nexxiot. The companies have also concluded a comprehensive cooperation agreement to rapidly progress digitalization and connectivity in the rail sector by creating advanced solutions – with the ultimate aim of contributing to sustainable, reliable and efficient rail mobility.

Captions:

Fig. 1: In spring 2022, Knorr-Bremse took a stake in asset intelligence specialist Nexxiot. The two partners also concluded a cooperation agreement and are now presenting market-ready products for the digital train. | © Nexxiot

Fig. 2: With smart hardware and a new cloud solution, Knorr-Bremse is creating the basis for promising digital business models with which the company intends to grow in the coming years. | © Nexxiot

Knorr-Bremse (ISIN: DE000KBX1006, ticker symbol: KBX) is the global market leader for braking systems and a leading provider of other systems for rail and commercial vehicles. Knorr-Bremse's products make a decisive contribution to improving safety and energy efficiency on rail tracks and roads around the world. Some 32,600 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2022, Knorr-Bremse's two divisions together generated global revenues of EUR 7.1 billion. For more than 115 years, the company has been the industry innovator, driving developments in mobility and transportation technologies with an edge in connected system solutions. Knorr-Bremse is one of Germany's most successful industrial companies and profits from the key global megatrends: Urbanization, Sustainability, Digitalization and Mobility.

Nexxiot is digitalizing freight asset management with technology that now oversees the world's most extensive network of connected shipping containers and railcars.

Clients gain access to unparalleled real-time data, which streamlines fleet management and automates logistics processes. Our devices, built for resilience, withstand extreme conditions and provide long-term, detailed insights into events affecting containers and railcars, including impacts, delays, security incidents, and loading activities.

Our Asset Intelligence technology significantly improves operational efficiency, enhances safety, enriches digital capabilities, and contributes to CO_2 reduction by encouraging a shift from road to rail freight.

Based in Zurich, Switzerland, Nexxiot's influence extends globally. Our team, comprised of industry experts, operates from offices in Europe and North America and maintains a presence in over 450 depots, ports, and rail yards.

To learn more about how Nexxiot is leading the digitalization and optimization of logistics and supply chain management, please visit www.nexxiot.com.

Media contacts:

Knorr-Bremse: Julian Ebert | Corporate Communications | Knorr-Bremse AG
T +49 (0)89 3547 1497; **E** julian.ebert@knorr-bremse.com

Nexxiot: Felix Zimmermann | Medienbüro am Reichstag GmbH
T +49 163 300 06 61; **E** felix.zimmermann@mar-berlin.de