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Press

Siemens Mobility GmbH

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Siemens Mobility highlights connected mobility at the InnoTrans 2018

- **Motto of the company's show: "Shaping connected mobility"**
- **Fair highlights: Digital Station, Interlocking in the Cloud and new Velaro Novo high-speed train with 30 percent lower energy consumption**
- **Digital solutions make infrastructures intelligent, improve passenger experience, guarantee availability and increase sustainability over the entire lifecycle**

Under the motto "Shaping connected mobility" at the InnoTrans, Siemens Mobility is presenting digital innovations in an increasingly networked "total mobility system." The solutions will make rail transport even more efficient, safer and reliable.

Digitalization is fundamentally transforming the mobility industry: It is improving the availability of vehicles and infrastructures, optimizing operations and reducing complexity, efforts and costs. It is providing travelers attractive and seamless mobility from A to B, and is helping rail operators make their infrastructures intelligent, improve passenger experience, guarantee availability and increase sustainability over the entire lifecycle of their investments.

MindConnect Rail – secure and robust transmission of system and diagnostic data for rail vehicles and infrastructure assets

MindConnect Rail, also based on the MindSphere IoT operating system, is a modular and flexible software and hardware solution for ensuring secure data transmissions from safety-critical infrastructures and rail vehicles. MindConnect Rail enables full and secure access to data in security-critical rail networks ranging from signaling systems to rolling stock and rail electrification systems. MindConnect Rail

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uses, among other things, all functions provided by the new Data Capture Unit (DCU) in order to ensure complete access to data as well as effectively prevent cyberattacks. The MindConnect Rail solution from Siemens Mobility is a central component of the intelligent transport infrastructure needed for the digital integration of rail and road transport and tomorrow's networked "total mobility system."

MindSphere, the IoT operating system from Siemens, enables new digital solutions for the rail industry through comprehensive data management

Each train generates large amounts of data that provides information on the train's condition and functionality of its components and systems. The same is true for rail infrastructures. Siemens' open IoT operating system MindSphere uses artificial intelligence to comprehensively manage this data, making possible completely new solutions for the rail industry.

Railigent, the open digital ecosystem is now providing 3rd-party applications

The Railigent application suite from Siemens Mobility enables operators to intelligently use rail data, optimize their maintenance and operations, and guarantee hundred-percent availability. Railigent is based on MindSphere, the IoT operating system from Siemens. In the past, Railigent could primarily be used to analyze Siemens systems. With its cooperations with partner companies and the integration of partner applications, Siemens can now provide customers with comprehensive asset management of their vehicle fleets and rail infrastructures. Siemens Mobility has already integrated applications from eleven partners, including SKF GmbH, Voith GmbH & Co. KGaA, Strukton Rail b.v., Konux GmbH and voestalpine Signaling Zeltweg GmbH. All of these companies have specialized competencies for the digitalized condition monitoring of vehicle components and rail infrastructures. On the basis of measurement data supplied by these applications, the maintenance of rail systems can be optimized and made more cost-efficient. The benefits include, for example, reduced lifecycle costs, extended service and maintenance intervals, and prevention of accidents or unplanned service downtimes.

New cloud-based solutions reduce the need for hardware installations

The "interlocking in the cloud" will revolutionize long-distance rail transport. With this system, interlockings as well as operator control logic can in the future be centralized at one location, free of spatial limitations. This will give operators unprecedented flexibility and generate cost savings for their infrastructure and

operations – naturally without any compromises in safety and security. Siemens Mobility is already working with partners on implementing this advanced technology.

Digital Station – interaction between integrated mobility offerings

Railway stations are vital hubs for intermodal urban transport. Only by ensuring that transfers between various transport modes are reliable, seamless, convenient and time-saving, will growing numbers of people use the most efficient and eco-friendly transport mode – public transport systems. Siemens Mobility's Digital Station solutions cover a broad spectrum of functions, ranging from infrastructure management and universal intermodal travel information to data analytics needed to continuously optimize operations. This helps operators achieve 100-percent availability, increases passenger throughput and improves travel comfort – important prerequisites for providing attractive public transport.

Digital twin provides full transparency for rail infrastructure projects

In cooperation with software partners like Bentley Systems, Siemens Mobility is using "Building Information Modeling" – a digital twin for the planning, design and construction of complex rail infrastructure projects. This computer-generated model provides an object-oriented, parametric and digital 3D depiction of the planned system. The database provides the prerequisites for extensive simulations that ensure system conflicts are avoided, risks of delays are reduced, and project implementation can be expedited.

Siemens Mobility is presenting another innovation in the sector of rail electrification at the InnoTrans: For the first time, the company can depict a rail system's electrical network and energy flows in a data-based real-time simulation. This functions by combining the SCADA network control system (Sitras RSC) with the intelligent energy management system Sitras iEMS together with Sitras Sidytrac RT. This enables peak loads to be predicted and avoided, makes critical network conditions transparent, enables train timetables to be optimized by energy demand and consumption, and ultimately reduces energy consumption by up to 15 percent.

Modular vehicle platform meets growing demands for flexibility, lower lifecycle costs and improved comfort

The new Velaro Novo from Siemens Mobility is a systematic further development of the three preceding generations of Velaros. Numerous innovations in details make

the new high-speed train a unique, highly efficient concept that consumes 30 percent less energy and substantially reduces investment and maintenance costs while at the same time providing a ten-percent increase in capacity. With its empty tube concept and numerous configuration possibilities, the Velaro Novo is future-proof and can be flexibly adapted to meet new design concepts and operator needs even after years in operation.

The new Vectron Dual Mode can be operated as both a diesel and electric locomotive. On electrified sections of track, the new locomotive is powered by electricity to save fuel and reduce maintenance costs. The locomotive can be switched to diesel mode on non-electrified sections. The Vectron Dual Mode concept enables operators to increase their sustainable value throughout the locomotive's lifecycle. The locomotive has been designed for freight transport in Germany and can be ordered from the end of September 2018.

This year, Siemens Mobility is again showcasing its products and solutions in Hall 4.2 and in the outdoor exhibition area. In addition to the highlights mentioned above, the company will also be showing the following vehicles outside:

- **Avenio M Ulm**: For its new Line 2, SWU Verkehr GmbH, a subsidiary of the municipal utility in Ulm, Germany, has ordered twelve Avenio M articulated trams that have been optimized for the Ulm tram routes with their steep grades. The Avenio M sets standards for safety: The “Siemens Tram Assistant” collision warning system helps the driver avoid accidents.
- **Metro Sofia:** Siemens Mobility is supplying the new metro Line 3 in Sofia, Bulgaria, with 20 Inspiro metro trains equipped with energy management and a train control system for automated operation including automatic platform doors.
- **Cityval Rennes B:** 25 Cityval Automated People Mover systems (APM) will begin operating on the second metro Line B in Rennes, France, as of 2020.
- **Rhine-Ruhr Express (RRX):** With its innovative design and digital networking, the RRX sets new standards for passenger comfort and convenience and operating availability in Germany’s most heavily populated Rhine and Ruhr region. The first of a total of 82 Desiro HC electric multiple-unit trains will be delivered starting at the end of 2018.

- **Desiro City Moorgate**: The Desiro City is the successful platform offering maximum flexibility, perfect passenger comfort and convenience, and low energy consumption for the British market. The trains being built for customer Govia Thameslink Railway (GTR) are the third order for this train platform. The first of the 25 ordered trains will begin service on London's Great Northern Line beginning late in 2018.
- **Desiro ML ÖBB cityjet prototype for battery operation:** Alternative drive systems are becoming increasingly important for operations on non-electrified rail routes. Working together with customer Austrian Federal Railways (ÖBB), a series-production Desiro ML ÖBB cityjet was equipped with a battery for operating without an overhead power line.
- **Vectron MS:** The Vectron is the universal locomotive for Europe; the multiple-system version enables it to provide cross-border freight and passenger service throughout Europe. The exhibited ÖBB Vectron can be operated in nine countries and also used in multiple-unit operation with other ÖBB locomotives, enabling it to be flexibly integrated into the customer's existing fleet.
- **Smartron:** The Smartron, the new locomotive from Siemens Mobility, is tailored to a specifically defined transport task and combines the advantages of a standard product with the proven platform technology of the Vectron. The Smartron was conceived as a preconfigured locomotive for freight transport in Germany and offers customers cost-efficient operation with high operational safety.

Siemens Mobility, together with ViP Verkehrsbetrieb Potsdam GmbH, will also be presenting their research project on the world's first autonomous tram at InnoTrans 2018. On a six-kilometer section of the tram network in Potsdam, Germany, Siemens Mobility will be demonstrating a test tram driving autonomously in real traffic on September 18 through 21.

This press release and additional material are available at:
www.siemens.com/press/innotrans2018

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Siemens Mobility is a separately managed company of Siemens AG. As a leader in transport solutions for more than 160 years, Siemens Mobility is constantly innovating its portfolio in its core areas of rolling stock, rail automation and electrification, turnkey systems, intelligent traffic systems as well as related services. With digitalization, Siemens Mobility is enabling mobility operators worldwide to make infrastructure intelligent, increase value sustainably over the entire lifecycle, enhance passenger experience and guarantee availability. In fiscal year 2017, which ended on September 30, 2017, the former Siemens Mobility Division posted revenue of €8.1billion and had around 28,400 employees worldwide. Further information is available at: www.siemens.com/mobility