

Media Information.  
28 March 2018

## **Autonomous helpers in production logistics: Driverless tugging trains reach next level**

Intelligent avoidance of obstacles +++ Dynamic route guidance according to delivery priorities +++ Interaction via smart watch

**Dingolfing.** Production logistics at BMW Group Plant Dingolfing is using driverless transport systems alongside manual tugging trains for the complex process of supplying its assembly lines with more than 20,000 numbered parts. Driverless tugging trains have been employed to cover the long distances between warehouses since 2016. Using a newly-developed automation kit, existing manual tugging trains, regardless of manufacturer, can be upgraded with the intelligence needed to deliver parts directly to the portioning zones in the assembly hall – taking autonomous driving in production logistics at the BMW Group to the next level.

The new technical solution stems from a development cooperation with Schiller Automatisierungstechnik, a firm based in Osterhofen in Lower Bavaria. Dr. Andreas Wendt, head of Plant Dingolfing, explains: “BMW Group Plant Dingolfing is at the forefront of digitalization. We are the lead plant piloting autonomous navigation of floor conveyors in logistics. Working with our partner, we have been able to upgrade the conventional tugging trains we already have for autonomous driving within just a few months. This technology of the future will enable us to organise logistics within the plant even more efficiently and secure the success of our plant going forward.”

### **Dynamic route guidance**

The capabilities of the driverless tugging trains go far beyond automation of earlier solutions. New and more intelligent logistics helpers enable dynamic route guidance according to delivery priority, with active negotiation of obstacles. From a technical viewpoint, autonomous control and navigation of tugging trains relies on laser signals, in a process known as laser multilateration. The hall environment is scanned several times per second with lasers and the reflections are displayed as a 2D spatial profile. In this way, the tugging train is able to navigate its way through the halls with a positional accuracy of +/- 10 mm, and without requiring any infrastructure modifications in the assembly halls and logistics areas.

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**Open interfaces and smart watch integration**

Keeping all the interfaces open allows the autonomous tugger trains to be integrated into the BMW Group's existing control and fault reporting systems and ensures that autonomous transport systems from different manufacturers can be used at the same time in the BMW production environment and are able to work together.

Plant Dingolfing is also piloting another future technology in conjunction with the autonomous tugger trains. A smart watch helps logistics staff with switching out containers and alerts them to approaching tugger trains with a vibration alarm. The employee can also read off which containers need to be emptied and send the tugger train on to its next destination by touching the display.

**From pilot operation to series maturity**

"As part of our future logistics strategy, we are working with the lead plants to roll out innovative technologies in a structured process. In the case of the autonomous tugger train, it was only a few months from the initial concept idea to successful pilot operation at the vehicle plant," explains Jürgen Maidl, head of Production Network and Logistics at the BMW Group. Once the pilot phase has been successfully completed, from summer of this year, Plant Dingolfing will deploy two autonomous tugger trains in series production to supply the sequencing zones for door pre-assembly with parts from the neighbouring logistics hall. Other BMW Group plants have already announced that they will also consider using autonomous tugger trains.

**Logistics of the future**

BMW Group logistics ensure that 30 million parts are delivered to the right place at the right time every day, so that around 9,500 new vehicles can be produced at 30 manufacturing locations. Innovative and digital technologies have become a key factor in managing the enormous complexity. The BMW Group is therefore already testing the technologies of tomorrow in a whole range of pilot projects today. In addition to the use of autonomous transport systems, a number of robotics solutions and big data applications are already on the road to series maturity.

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**Captions**

Photo 01: An autonomous tugger train supplies the portioning zone of door pre-assembly at BMW Group Plant Dingolfing with parts from the warehouse.

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Telephone: +49 8731 76 22020, Email: [Birgit.Hiller@bmw.de](mailto:Birgit.Hiller@bmw.de)**The BMW Group Plant Dingolfing**

Plant Dingolfing is one of the BMW Group's 30 global production sites. At Plant 02.40, about 1,600 cars of the BMW 3, 4, 5, 6, 7 and 8 Series roll off the assembly lines every day. In total, the plant manufactured more than 376,000 cars in 2017. At present, a total of approx. 18,000 people and 800 apprentices work at the BMW Group's site in Dingolfing.

In addition to the automotive core production, BMW Group Plant Dingolfing is also home to production facilities for vehicle components such as pressed parts, seats as well as chassis and drive components. Due to the plant's aluminium expertise in vehicle construction and longstanding experience in producing alternative drives, BMW Group Plant Dingolfing furthermore provides crucial components for the BMW i models – such as high-voltage battery, e-transmission and the drive structure – to the production site in Leipzig. In addition, Dingolfing produces both high voltage batteries and electric engines for the BMW Group's plug-in hybrid models.

The car bodies for all Rolls-Royce models are also manufactured at the site. The Dynamics Centre, a large storage and transshipment facility, provides the global BMW and MINI dealership organization with original parts and equipment.

**The BMW Group**

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises 30 production and assembly facilities in 14 countries; the company has a global sales network in more than 140 countries.

In 2017, the BMW Group sold over 2,463,500 passenger vehicles and more than 164,000 motorcycles worldwide. The profit before tax in the financial year 2017 was € 10.655 billion on revenues amounting to € 98.678 billion. As of 31 December 2017, the BMW Group had a workforce of 129,932 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.



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