

Media Information
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All BMW Group vehicle plants to be digitalised using 3D laser scanning by early 2023

+++ Digital twin leverages vast efficiency potential in planning process +++ Highly innovative 3D scanning creates photorealistic images of all building structures, facilities and outdoor areas +++ "New dimension of factory planning"

Munich. By early 2023, the BMW Group will have a digital scan of every one of its vehicle plants worldwide. In this way, the company is systematically merging the real and virtual worlds and tapping into the enormous potential for highly efficient planning of future plant structures and production facilities. "This opens up entirely new possibilities for us to implement both extensive new planning and smaller-scale remodelling of existing structures in a highly efficient, precise and flexible manner," says Michele Melchiorre, head of Production System, Planning, Tool Shop, Plant Construction at the BMW Group.

Alongside data science and artificial intelligence, virtual planning is a core element of digitalisation within the strategic vision of BMW production: the BMW iFACTORY. The aim is to make planning and simulation of all processes and the entire production system 100 percent virtual. Virtualisation takes planning for all processes to a new level, by enabling collaboration in real time between different locations and across different time zones. "Production planning can integrate the virtual product into the virtual factory at an early stage. This reduces planning effort and capital expenditure and, at the same time, ensures processes are more efficient and more stable during ramp-up," explains Melchiorre.

For completely new future production structures, the BMW Group will rely on cooperation with NVIDIA and its Omniverse software platform. "We are entering a new dimension of factory planning," underlines Melchiorre. This means planners can conduct a virtual walk-through of BMW Group plants at any



time, from anywhere. They can develop production systems together in the simulated world, compare best practices and share information quickly and easily within the network. "This forms the basis for planning and developing our new vehicle plant in Debrecen in Hungary," continues Melchiorre: "Today, around three years before the series launch, we are already able to simulate core processes at our future plant virtually."

The BMW Group is digitalising its existing plants in cooperation with NavVis. The Munich startup is considered one of the world's leading providers of technology in the field of reality capture and digital twins. Mobile 3D laser scanners will be used to create photorealistic panoramic images, floor plans and scatter plots for all BMW Group vehicle plants, by early 2023, that are accurate down to the last detail, including all building structures, facilities and outdoor areas.

Since November 2020, around four million square metres of indoor space and nine million square metres of outdoor space at BMW Group plants have been scanned using portable mobile scanning systems and drone systems. As a result, digital twins are already available for the US plant in Spartanburg, the main plant in Munich and Plant Regensburg. Plants Dingolfing, Leipzig and Tiexi in China will also be captured by September of this year. By spring of 2023, digital data will also be available for the BMW Group plants in Mexico, South Africa, the UK and Dadong, China. The NavVis IVION Enterprise platform will then create a digital image of reality – the Digital Twin – from these huge data volumes.

Around 15,000 BMW employees are already working with this data, using a cloud- and web-browser-based software called the BMW Factory Viewer. With the help of this software and with just a few clicks, existing plants can be virtually inspected, specific points in production found via points of interest (POIs) and highly precise measurements carried out.



The system also allows individual sections of the 3D scans to be cut out and made available to external suppliers, for instance. This saves time and effort during production planning, improves collaboration with internal and external interfaces and eliminates planning errors.

3D scanning technology also allows both smaller and larger-scale remodeling projects at BMW plants to be transferred quickly and easily to the digital world, using the so-called re-scan process. The company is working in this area on developing its own autonomous scanning robots to keep the digital master data current in the long term, without requiring additional personnel effort. For this purpose, the BMW Group is using in-house solutions, such as the Smart Transport Robot (STR) developed by BMW Group subsidiary IDE-ALWORKS. Michele Melchiorre: "Partnerships like those with NVidia and Nav-Vis allow us to combine our pioneering spirit and process know-how with cutting-edge technologies."

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The BMW Group production network

The BMW Group has regarded itself for decades as the benchmark for production technology and operational excellence in vehicle construction. BMW iFACTORY. LEAN. GREEN. DIGITAL. represents the strategic vision of the worldwide production network. It provides answers to the challenges of the transformation towards e-mobility, with a global approach.

Lean stands for efficiency, precision and the highest level of flexibility, as well as outstanding integration capability. Green means using state-of-the-art technologies to establish production with minimal use of resources. The aim is to reduce CO2 emissions per vehicle from production by 80% from 2019 levels by

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2030. Digital focuses on data science, artificial intelligence and virtual planning and development. In this way, BMW Group production is able to make a decisive contribution to the company's profitability.

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 31 production and assembly facilities in 15 countries; the company has a global sales network in more than 140 countries.

In 2021, the BMW Group sold over 2.5 million passenger vehicles and more than 194,000 motorcycles worldwide. The profit before tax in the financial year 2021 was € 16.1 billion on revenues amounting to € 111.2 billion. As of 31 December 2021, the BMW Group had a workforce of 118,909 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company set its course for the future early on and is making sustainability and resource efficiency the focus of the company's strategic direction – from the supply chain, through production, to the end of the use phase, for all its products.

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