



Not only is the R80XL the world's largest transportable Ferris wheel, but it also sets entirely new standards when it comes to safety, efficiency, and comfort

Maurer German Wheels GmbH, Germany

Strong momentum for steel giants

It is possible to hang 80 m above the ground with the world's largest transportable Ferris wheels, designed by Bussink Design and built and tested by Maurer German Wheels in Munich. Modern automation and integrated drive systems ensure not only a high level of safety but also greater energy efficiency during operation.

Many people from Munich are already familiar with it – the world's largest transportable Ferris wheel, with a height of 80 m, a diameter of 74 m, a weight of 750 t, and 27 passenger cabins. The venue is the premises of Maurer German

operators. Siemens provided all the electronic components as well as the drive systems and the integrated automation based on TIA Portal.

Intelligent redundancy concept for maximum safety

When it comes to safety, the R80XL meets the highest standards. It is equipped with a fail-safe S7-300F which has been designed in a redundant manner. It has one active Simatic S7-300F, and another is available as a backup and can be activated at any time. Furthermore, all the switching technology has been distributed in two redundant, spatially separate electrical containers. Even in the event of a full power failure, the Ferris wheel is well equipped: it has an emergency generator, but it can also resort to gravity itself. Due to the high quality of the bearings, the mass center of the wheel automatically shifts downward until the last cabin has been emptied. This makes it possible to completely evacuate the wheel at any time.



Technology at a glance

- Fail-safe Simatic S7-300F for the wheel's entire control system
- TIA Portal to monitor and control the functions in the 27 cabins
- 8 Simotics GP motors monitored by a condition monitoring system
- Sinamics G120 frequency inverter for application-specific rotational speed regulation
- Industrial Wireless LAN

Each of the eight drive motors of the R80XL has its own final control device that perfectly regulates contact pressure. Motors from the Simotics GP series are integrated

Wheels GmbH at Frankfurter Ring. In the past two years, the model R80XL steel giant has been assembled twice for testing. After undergoing intense technical testing, its market can be found in the large metropolises of the world, where the Ferris wheel will be a tourist attraction for a limited period of time. The first version, for example, is currently turning under the name "Star of Puebla" in Mexico. Such a giant poses an enormous technical challenge to the

Integrated drive concept with high energy efficiency

For the drives, the R80XL is equipped with eight motors from the Simotics GP series, whose supply systems are intelligently networked via Profinet and are constantly monitored using a condition monitoring system. The force is transmitted indirectly via the drive gears that drive the wheel at different ▶▶



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The application was implemented using a modular Sinamics G120 inverter

points along its outer ring and that are always pressed against the wheel with optimum contact pressure by using intelligent final control devices. In addition, each of the eight motors has its own Sinamics G120 inverter. This extremely compact frequency inverter controls the rotational speed in a targeted, application-specific manner; reduces wear and tear; and enables braking energy to be recovered and fed back into the local power supply grid. "Thanks to Integrated Drive Systems, all the components of the drive system are seamlessly integrated not only horizontally but also vertically during the entire lifecycle. This leads to increased efficiency and long-term availability," explains Wolfgang Sanders, specialist for fairground rides at Siemens in Bremen. Furthermore, combining automation and inverter technology eliminates cost-intensive load peaks when the wheel starts up. Marcel Moesler, Technical Flying Doctor at Bussink Services, adds: "In reality, it is possible for us to store the maximum load in the system, and the automation takes care of everything else." The engineers have also created energy-efficient solutions for the lighting and have equipped the wheel exclusively with LED lights. Compared to traditional lighting, this can result in up to 90% energy savings. It also reduces the daily amount of work involved in changing countless burned-out lightbulbs.

Everything under control

The wheel is controlled and driven from a central operator's platform from which the operator has a complete visual and technical overview of the equipment. Automation with TIA Portal also contributes to loading the wheel smoothly. Since all 27 cabins con-

stantly transmit information on their status via Industrial Wireless LAN and the ticketing system on the front continuously communicates the number of passengers standing in line, the Ferris wheel's loading program can load the cabins in an ideal manner and distribute the weight statically correct, which is an enormous advantage, especially when the wheel is starting up. The functions of the fully air-conditioned cabins equipped with information and communications technology, as well as the lighting, are controlled and monitored via TIA Portal. Sanders sums up the advantages: "The wheel is gigantic. With intense monitoring, we can diagnose errors immediately and take the appropriate countermeasures."

Implementation with plug and play

With TIA Portal and networking via Profinet and IWLAN, integrating new elements is extremely easy. "In both wheels we have built thus far, it was no problem to add extensions. We ordered a part at Siemens, it was delivered, we plugged it in, and it worked – so it's basically plug and play," reports Moesler enthusiastically. Another advantage for future operators of the Ferris wheel: all the wheel's components fit into standard sea containers, and all the required Siemens components are available worldwide. Moesler is certain that the success story won't end here: "Interest in the wheel is huge." ■

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