

# Case Study

## Dortmund Stadium, Germany



**SOLiD**, in partnership with **1&1** and **Rakuten**, are delivering a step change in the football experience at **Signal Iduna Park, Dortmund, Germany** the famous home of the mighty Borussia Dortmund and their ‘Yellow Wall’ of support. The solution leverages OpenRAN technology and mMIMO antennas to create a unique 4G and 5G environment at Germany’s largest football stadium. Fans at the 81,000 to 82,000 - capacity ground can now experience an outstanding mobile experience at every seat. This landmark project was successfully implemented ahead of the stadium's 50th anniversary in 2024.

Signal Iduna Park is now the world’s first Open Radio Access Network (O-RAN) stadium. Developed by the O-RAN Alliance, this open standards-based solution enables the hardware and software within the network to interoperate both seamlessly and securely regardless of its originating vendor. This innovative technology enables high data transfer rates and high levels of stability for all stadium attendees. In addition, the O-RAN solution achieves all of this while requiring less power and taking up significantly less space with its lightweight components.

The stadium is one of the most famous in the world, known for its outstanding atmosphere and passionate supporters. It holds the European average attendance record set in the 2011-12 season with 1.37M fans over just 17 games. The south bank houses the largest standing terrace in European football (capacity of 24,454) and is nicknamed “Die Gelbe Wand” (the yellow wall).





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Not only did the stadium play host to games in the 1974 and 2006 World Cups but it also hosted the final of the UEFA Cup Final in 2001 and was used in the 2024 European Championships. A stadium of this size and reputation demands the very best in terms of fan experience and this extends to mobile coverage.

However, stadiums such as Signal Iduna Park provide a unique set of challenges when it comes to providing cutting-edge mobile connectivity. The stadium covers a large area and coverage needs to extend to the indoor areas as well as the seating and terraces. The solution has to be robust enough to support tens of thousands of users with a variety of needs from voice traffic to live streaming video.

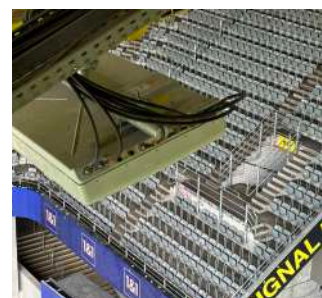
The finished solution has addressed these concerns by delivering 30 network sectors within the stands and a further 4 in the indoor areas, an additional 2 sectors are serving the north and west entrance & parking areas of the stadium. In the stands, the network consists of 48 radio units and 128 antennas with a further 60 radio units for 4G and 5G coverage and 21 antennas in the indoor areas. The total solution encompasses more than 10 km of fibre optic cable and another 30 km of cable to provide optimal performance. This provides outstanding connectivity not only for 1&1 customers but also for those on other networks as well.





“Our new Digital Antenna System at Signal Iduna Park sets a new standard for connectivity in stadiums. By integrating cutting-edge 4G and 5G capabilities with O-RAN technology, we’re delivering unmatched, seamless coverage to fans, staff, and operations at one of the world’s most iconic sports venues. This installation demonstrates SOLiD’s commitment to advancing mobile connectivity and enhancing the fan experience through innovative, high-performance solutions.”

- Steven Gallagher, Managing Director EMEA, SOLiD



For its part, **SOLiD** has provided its GENESIS Distributed Antenna System (DAS) as part of this cutting-edge solution. This fully digital DAS enables the transmission of signals from all the major mobile operators at the same time, helping to improve the mobile signal quality in all areas of the stadium. This is achieved over multiple sectors and the use of 150+ slim line, low power consumption radio units at strategic points through the stadium. This has enabled the provision of both 4G and 5G connectivity to all users of Germany’s 4 main network providers.

**SOLiD**, in partnership with **1&1** and **Rakuten**, is proud to be able to deliver this mobile connectivity solution at the iconic Signal Iduna Park that highlights the amazing potential of OpenRAN technology.



“**SOLiD** is proud to participate in this game-changing project, combining both extremely high capacity for all operators and the latest technology ORAN feeding. As a result, ORAN in combination with GENESIS digital DAS makes a true difference and drastically reduces power consumption, space and weight of the system. Clearly a forward-looking approach observed by all European operators! ”

- Ingo Flömer, VP Business Development Europe