

HEIDELBERG CONGRESS CENTER: STRONG WI-FI FOR STRONG EVENTS



Photo: Andreas Gieser

High-density Wi-Fi and central orchestration via the cloud | The new Heidelberg Congress Center views space as performance: With visionary architecture, creative space solutions and holistic concepts for hybrid events, the venue enables forward-looking opportunities for sustainable community building. At its core is a light-filled hall with a height of 14 meters and capacity for up to 1,800 people – complemented by the largest permanently installed LED wall in Germany, a flexible hall for up to 800 visitors, various forums, and a green-screen studio for live streaming, recording, and video production. Across a total of around 6,600 square meters of event space, one principle applies: the technology must work – no exceptions.

Requirements: thousands of guests. High ceilings. Flexible setups.

As the operator of the HCC, Heidelberger Kultur- und Kongressgesellschaft mbH (HKK) is responsible for planning and continuously developing the digital infrastructure. The goal was to provide comprehensive, high-performance Wi-Fi throughout the entire building – designed to support more than 5,000 users online simultaneously. In addition, a separate internal network was required to provide a robust foundation for building operations and numerous digital systems beyond media technology.

At the HCC, a wide range of usage scenarios come together: traditional conferences, hybrid formats, live-streaming setups, and large visitor flows. Particularly demanding was the large hall, which was to be designed to support up to 3,000 Wi-Fi users simultaneously. The architecture posed clear constraints: access points could not be installed on the side walls and instead had to be mounted on the 14-meter-high ceiling. This installation height increases overlap in the radio field – creating risks such as interference, unstable handoffs, and connection drops. A solution was therefore

required that precisely aligns access point density and antenna selection with the specific conditions, ensuring reliable coverage and stable connections even under heavy load.

Solution: Orchestrated from the cloud: precise coverage for every event format

Together with R&S®NC partner Heidelberg iT Management GmbH & Co. KG, a network infrastructure was created that consistently integrates Wi-Fi, switching, and centralized management – designed for high user numbers, fluctuating loads, and stable operation in day-to-day event use. For the guest Wi-Fi, the HCC relies on Wi-Fi 6 and WPA3 – ensuring strong performance with a high density of devices and modern security in an open event environment. A key component is the R&S®LANCOM Management Cloud (R&S®LMC): it is used to centrally deploy, manage, and monitor the network components. New devices can be provisioned automatically via zero-touch provisioning – particularly beneficial for expansions or adjustments during ongoing operations.

“Professional network management is essential for a modern event venue such as the Heidelberg Congress Center. The R&S®LANCOM Management Cloud (R&S®LMC) provides valuable tools to optimally manage the administrative processes of the complex network infrastructure while enhancing its stability and security. In addition to security, delivering an excellent user experience for guests, organizers, and staff is a top priority.”

Burkhard von Dewitz, Project Manager, Heidelberg iT

For wireless coverage in demanding areas such as the large hall, the Wi-Fi design was tailored to the structural requirements, particularly ceiling mounting. Access points with external antenna connectors are used in combination with a comprehensive antenna portfolio, allowing radiation



Photo: Andreas Gieser

patterns and radio cells to be precisely adapted to the spatial conditions in order to minimize overlap and interference.

To ensure that the Wi-Fi does not require manual readjustment even with strongly fluctuating loads, R&S®LANCOM Active Radio Control™ 2.0 enhances the environment – as a feature of the R&S®LANCOM Management Cloud (R&S®LMC). Especially in the day-to-day operations of a congress center – with peak loads, parallel sessions, and hybrid productions – ARC 2.0 analyzes actual usage patterns and continuously calculates the optimal configuration: channels are distributed efficiently, transmission power is dynamically adjusted, and capacity is allocated where it is needed most. The result is a continuously optimized radio field – with consistently high user experience and significantly reduced administrative effort. In addition, specialized outdoor access points ensure reliable Wi-Fi connections in the outdoor areas of the congress center as well.

Implementation: Right on time for the opening: rollout from a single source

The implementation was carried out in close coordination between HKK and Heidelberg iT. Heidelberg iT handled the full implementation of the network from a single source – from planning and deployment through to operational hand-over. As an experienced IT service provider for large Wi-Fi environments, Heidelberg iT contributed the necessary expertise to meet the requirements of modern conference

operations. The project was completed as planned and on schedule for the opening of the HCC in April 2024.

Customer benefits: Stable event operations and securely segregated internal use

During events, the Wi-Fi at the HCC demonstrates its strength: even with rapidly changing loads and large visitor volumes, coverage remains stable and adaptable. Guests, organizers, and staff benefit from a stable connection and consistently high-quality user experience – even when thousands of devices are connected simultaneously. Heidelberg iT supports operations with a dedicated service

„The Heidelberg iT team works seamlessly and with complete reliability. The IT experts respond quickly, flexibly, and always in a solution-oriented manner to our requirements – whether it involves camera surveillance, the IT and Wi-Fi network, or special customer requests for events. Everything runs reliably, allowing us to focus fully on our customers.“

Thomas-W. Sante, Managing Director,
Heidelberger Kultur- und Kongressgesellschaft mbH

team that continuously monitors the environment and responds quickly when needed – even during ongoing events. This creates security in day-to-day business and takes pressure off live operations.

In addition, clearly separated internal usage ensures structure and protection: the media technology operates on its own network, while Heidelberg iT has established a separate internal network for software-based online applications. This network supports office and operational applications as well as building management and facility systems and security-relevant systems – including access control and networked components ranging from the doorbell to studio technology. This ensures that event operations remain high-performing, while internal systems are cleanly separated, reliably supported, and future-proof.

Looking ahead

After its use in the Heidelberg Congress Center, HKK is also relying on network solutions from Rohde & Schwarz Networks and Cybersecurity and the expertise of Heidelberg iT for the equipment of the Stadthalle Heidelberg concert hall.

The customer

Heidelberger Kultur- und Kongressgesellschaft mbH (HKK) operates the Heidelberg Congress Center (HCC) and the Stadthalle Heidelberg concert hall, and continuously develops the HCC as a modern platform for congresses, conferences, and hybrid formats. Its focus is on professional, reliable event operations, supported by a digital infrastructure that ensures smooth processes and effectively supports a wide range of event scenarios.

The partner

As a R&S[®]NC partner, Heidelberg iT Management GmbH & Co. KG specializes in network technology and Wi-Fi solutions. The IT systems integrator has extensive experience in planning, deploying, and operating large-scale Wi-Fi environments, as well as complex network infrastructures for clients across industry, academia, and the public sector. For the Heidelberg Congress Center project, Heidelberg iT was responsible for the end-to-end implementation and continues to support operations with comprehensive services, ensuring that organizers, staff, and guests can rely on a stable, professionally managed network.

AT A GLANCE

The customer

HEIDELBERG[®] CONGRESS

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The partner

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The requirements

- Comprehensive high-density Wi-Fi
- Designed to support more than 5,000 simultaneous users
- Specialized radio planning for the main hall (ceiling mounting at a height of 14 m)
- Separate internal network for digital systems beyond media technology

Components used

- Switches:
R&S[®]LANCOM GS-4530XP
R&S[®]LANCOM GS-4554XUP
- Access points and antennas:
R&S[®]LANCOM LX-6400
R&S[®]LANCOM LX-6402
R&S[®]LANCOM OX-6400
R&S[®]LANCOM OX-6402
R&S[®]AirLancer ON-Q360ag
R&S[®]AirLancer ON-QT60
- Network management:
R&S[®]LANCOM Management Cloud with Wi-Fi optimization
R&S[®]LANCOM Active Radio Control™ 2.0



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