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Interlinked emergency sound and public address solution for Shenzhen World Exhibition & Convention Center

Customer story

How to ensure reliable voice announcements and background music without echoing?

With an exhibition space of over 500,000 square meters, Shenzhen World Exhibition & Convention Center is the largest trade fair and congress center in the world. Bosch succeeded in equipping this huge venue with a customized communication and security solution in record time.

From a fishing village to a megacity – within just 40 years, Shenzhen has managed to transform itself from a small community to China's Silicon Valley. The metropolis on the Pearl River Delta lives up to this claim with the Shenzhen World Exhibition & Convention Center. The world's largest trade fair center is spread out across a total area of 1.6 million square meters. The venue offers about 500,000 square meters of exhibition space across 19 halls. This attracts a huge number of visitors, but

also presents significant challenges in terms of security, safety and communication technology. For example, in the event of an evacuation, the loudspeakers in the building would have to be powerful enough for the emergency messages to be heard clearly by each visitor across the over 20,000 square meter trade fair hall. During normal operation, the public address system has to provide high-quality and reliable voice announcements and background music without echoing.



Bosch could meet these acoustical challenges of the Shenzhen World Exhibition & Convention Center with an ideal solution for large, elevated ceiling areas: The Hemi-directional Loudspeaker. It contains 14 loudspeaker drivers which ensure sound is radiated equally in all directions under the loudspeaker and reduce sound reflection from the ceiling. Due to its large opening angle and high sound pressure level, the loudspeaker guarantees sound and speech intelligibility over an area of least 700 square meters. To avoid echo, the system uses a “delay” principle, where the second speaker starts right after the first speaker once its sound has travelled the distance of 700 meters. The third speaker then starts with twice the “delay” after the first speaker, and so on. In total, 425 of the innovative devices were installed in the exhibition halls.



“We managed to reduce the number of loudspeakers needed by using these Hemi-directional Loudspeakers. Energy and operational costs for the operator were cut as a result.”

Kevin XU, Product Marketing Manager at Bosch Security Systems China

The loudspeakers are connected to a Bosch public address and voice evacuation system with professional sound quality. This system is particularly suitable for the trade fair center’s requirements. The flexible system architecture and IP connections guarantee that music and information is transmitted selectively throughout the different halls. “The system has to facilitate both building-specific audio signals and system-wide announcements so that visitors feel safe and comfortable in the huge building. For example, an announcement in Hall 1 shouldn’t interfere with the music in Hall 2 – except in case of an emergency,” says Kevin XU, Product Marketing Manager at Bosch Security Systems China. An integrated hardware and software with intelligent energy management reduces system use, not to mention energy consumption and the building’s carbon footprint.



Taking these special building requirements as its basis, the project team developed an integrated and fully networked solution. It consists of 200 amplifiers, the aforementioned 425 hemi-directional loudspeakers, exclusively designed for large complexes like exhibition halls, and nearly 9,000 different types of loudspeaker, including column speakers, cabinet speakers and ceiling speakers. 27 public address and voice evacuation systems are distributed in five control rooms and are connected via IP networks, for each hall must be able to broadcast separately while being managed centrally for joint broadcasts. In addition, Bosch also equipped the facility with an intrusion alarm system and 1,000 detectors, as protection from potential intruders.



But it wasn't just the architecture and acoustics at the Shenzhen World Exhibition & Convention Center that represented challenges when it came to the communication solution. The experts from Bosch only had two months to carry out this complex project. "Supplying this huge volume of products within such a short timeframe was a major challenge. But despite the tight schedule, the Bosch team came together, from global supply chain to production and other sales regions, as a whole to shorten the original eight-month delivery period to two months," says Kevin XU. The system performance and huge space sound of the loudspeakers has since provided crystal clear sound quality throughout the 19 trade fair halls, while also guaranteeing that the thousands of visitors to the venue are kept safe.