SX2000SM control rack in the FCC

An EN-54 compliant TOA SX2000 SM matrix controls the audio in Exchange 106

Exchange 106 has risen majestically above the TRX site

Rising to the challenge

TOA has installed Malaysia's highest new-build tower with an extensive PA system. **Richard Lawn** reports from 106 floors up

SURPASSING KUALA LUMPUR'S ICONIC PETRONAS Twin Towers, Exchange 106 has become Malaysia's tallest skyscraper to date. Located at the heart of the new Tun Razak Exchange (TRX) financial and business hub, the 106-storey steel structure is the latest addition to the Malaysian capital's impressive cityscape. Constructed and managed by Indonesian commercial property developer Mulia Group, the 245,000m² of lettable space includes 93 column-free office floors. TOA Malaysia was called upon to provide an extensive public address system comprising some 5,000 loudspeaker outputs that stretches the 452m from the ground-level car park to the observation deck.

The project drew on strong teamwork between TOA Asia Pacific members, predominantly TOA Indonesia and TOA Malaysia. TOA Malaysia's project sales team, led by Alan Chung, collaborated with Mulia Group's Ibu Maryland Theresya and Ir Kenneth Lin for the design and compliance of the five-star building.

Design elements of the Green Building Index (GBI)-certified building include provisions for energy and water savings, connectivity to public transport and the adoption of extensive greenery around the building. Similarly, the New Zealand-based consultant for the project opted for the fire and safety international standard-compliant speaker system to fulfil its client's requirements. Specified for its reliability and ease of operation, an SX-2000SM System Manager lies at the heart of the TOA matrix for all the public address paging, BGM and voice evacuation requirements, providing an EN54-compliant, network-enabled concept.

Operating over the building's fibre backbone infrastructure, the decentralised concept was conceived by the engineering teams from TOA Singapore and TOA Malaysia, led by Kenny Chang. The teams also carried out special PAS software customisation for the fire evacuation announcement and mode of broadcast. Providing the operator with a simplified overview of Exchange 106, a customised SX-2000 software interface connects any of the 16 audio inputs to any of the zones on all the levels. System settings have been created into the GUI of the PCs' surveillance, priority and level tabs.

Announcements in the FCC can be made from the RM-200SA, IP and RM-200SF microphones

The SX-2000SM assigns audio feeds including five EV-700 digital announcers and a TOA CD-2011R player connected to two SX-2100AI audio input units. More traditional paging announcements can be conducted from an RM-200IP remote microphone. However, the inclusion of an N-8600MS multifunctional master station connected to the IP LAN network promotes hands-free conversation between the FCC and the various intercom stations connected to the IP Intercom Exchange. An RM-200SF fireman's microphone takes priority status should an emergency evacuation announcement need to be made.

The resultant signals are distributed from the racked SX-2000 system to a distributed network of 13 SX-2100AO audio output units that can detect faults and monitor amplifier malfunctions. In the event of a power cut, 13 VX-2000DS emergency power supplies ensure the audio system operates for a further two hours or until the power returns to normal. The entire speaker system is powered by a total of 26 VP-3154, VP-3304 and VP-3504 four-channel digital amplifiers. To minimise speaker cable distances, the amplifiers are located approximately six levels apart together with 13 VX-3000DS emergency power supply manager units in the event of a power outage.

The extensive ceiling speaker solution consists largely of 3,714 PC-648R 5-inch models, which are integrated with a resin panel and speaker frame, feature a spring clamp mechanism that can be mounted to the ceiling and input impedance that can be switched by changing the tap position on the transformer. A total of 181 SC-615M paging horn speakers have been wall-mounted in back of house areas such as the car park, while a further 841 BS-634 wall-mount speakers provide coverage for zones where ceiling speakers could not be installed, including the fire escape staircases. Selected for their discreet design and long-throw capabilities, a number of SR-H2L line array speakers have been installed above the reception areas and walls of the lower levels.

Currently under construction at ground level, the wide surface area of the TRX shopping mall contrasts markedly with this overshadowing apex. However, the challenge to integrate intelligible audio into the architectural blueprints remains paramount across a wide horizontal area as it does vertically in Exchange 106. Fortunately, the tried-and-trusted SX-2000SM matrix provides a flexible basis to create such loudspeaker designs.

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