



Mecca Royal Clock Expands DTS Coverage with AP Sensing

The **Mecca Royal Clock Tower** (also known as the Abraj Al-Bait Towers) is an engineering and architectural marvel, and is located near the world's largest mosque, as well as Islam's most sacred site, the Masjid al Haram.

The Tower implemented a **Distributed Temperature Sensing (DTS) solution from AP Sensing originally to monitor the enormous media walls, which together contain some 2 million LED lights**. The walls generate about 1.8mW and need to work in very hot direct sunshine, during cool nights or in the shade, and high winds.

After years of issue-free operation it was decided to expand the DTS coverage beyond the media walls to include the crescent itself, as well as the technical rooms and loudspeaker amplifier rooms below. The crescent is **23 m high and weighs some 35 tons**, with a complex series of lighting inside. It is made of fiberglass-backed mosaic gold. The **massive loudspeakers and their power supply** are located in the minaret base and emit **calls to prayer that can be heard 7 km away**. Some **21,000 lamps illuminate the base, which can be seen 30 km away**.

To ensure the most modern and rugged system of heat detection and monitoring available, **AP Sensing's Linear Heat Series was selected. Four Distributed Temperature Sensing devices were installed** as explained below, to ensure continuous, fully-redundant monitoring in real-time.

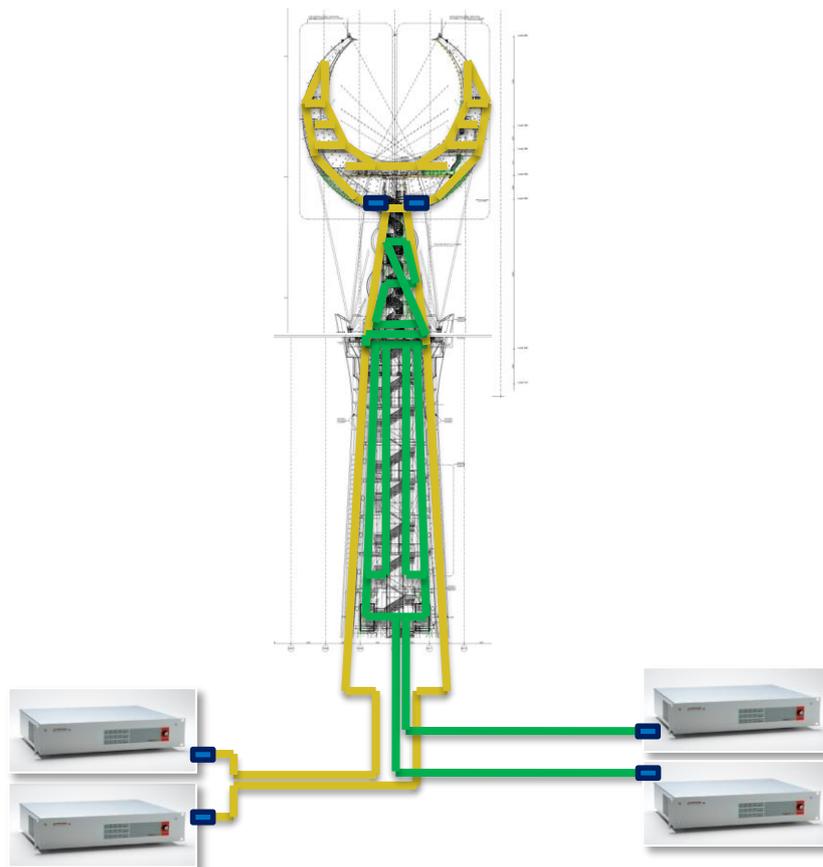


AP Sensing design concept

Planning together with local partners, it was decided to install **2 DTS devices to monitor the spire, amplifier room and the crescent base** (shown in green in the diagram below), and **an additional 2 devices to monitor the flashing lights along the cables in the crescent** (shown in yellow in the diagram).

The resulting setup is **fully redundant**: even in the unlikely event of a fiber break or system fault, monitoring continues uninterrupted. The ability to **configure up to 256 zones per section** means that, for example, individual loudspeaker rows, or the rising mains, or the flashing lights in the crescent can each be monitored according to their specific requirements.

Each DTS device has **19 configurable potential-free relay contacts** (relay #1 is reserved for system faults). And each is equipped with a **Modbus TCP interface** for temperature and alarm export.



The Royal Clock Tower crescent and technical rooms

Conclusion

The latest AP Sensing DTS Mecca project **reduced the overall complexity of the installation and the zone mapping**, thanks to the way the DTS units were separated from another. This setup also made it possible to use independent systems in the fire control panel areas. Extremely **valuable assets remain protected**.