



# Switchgear Busbar Monitoring

## Singapore

Supplying clean drinking water in Singapore has been a challenge for over a century, making the process of water desalination important. AP Sensing was selected to monitor several switchgears in a water desalination plant. While traditional temperature monitoring methods are not compatible with high voltage and high-density switchgear, our fiber optic-based Linear Heat Detection (LHD) solution constantly monitors the temperature of all busbars within each low-voltage switchgear.

The operators selected ten AP Sensing LHD devices with a 1 km range and either two or four channels each. The devices are distributed through the control rooms of the desalination plant and each monitors a suite of switchgear that comprises about ten smaller individual switchgear panels. A Modbus TCP interface, integrated into each LHD controller, is used to communicate with the SCADA system.

The passive sensor cable is immune to electromagnetic interference (EMI) and virtually maintenance free. In the event of a busbar overheating beyond its normal operating temperature of around 100 °C, information regarding the exact busbar within the switchgear is available to the plant operators. Up to 256 different zones can be defined and assigned different alarm criteria, thereby matching the detection requirements for the busbar operational characteristics. This can also include adjustments for differing busbar load fluctuations.



*Schematic diagram of the installation at one of the ten locations*



*Desalination plant in Tuas, Singapore*

A fiber optic-based LHD solution is highly reliable, even in the hostile interior of an electrical switchgear. More conventional systems tend to trigger unnecessary false alarms, an error that can result in expensive repairs, and in extreme cases could lead to a plant shut down. Traditional techniques use individual copper wires that conduct electricity when insulation degrades at high temperatures, leading to the activation of switchgear fault protection and potential plant outage.



*Testing the cable installation onto busbar of low-voltage switchgear*

This LHD solution provides real time monitoring of all low-voltage switchgear without the need for time-consuming personnel inspections.

Our regional partner tested this solution with the switchgear manufacturer and committed to providing the local installation and maintenance service. Operator training was also provided locally.

The system has been running without incident since installation which proves the reliability and robustness of the AP Sensing solutions.