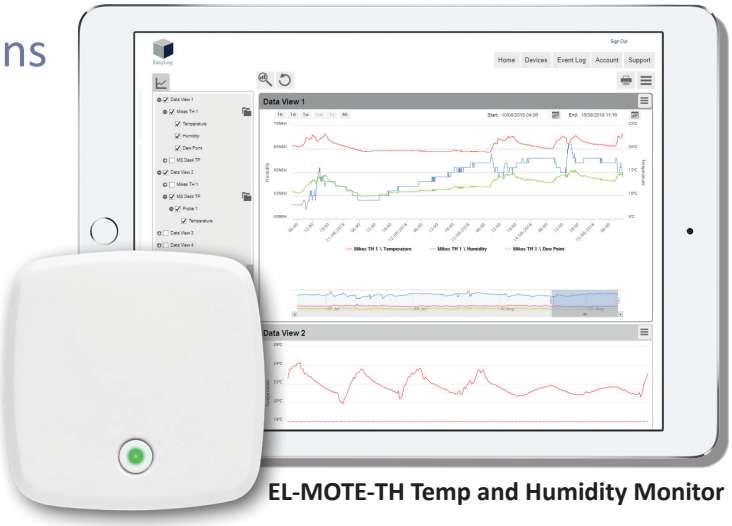
The Power Networks Demonstration Centre

Temperature and Humidity Monitoring in Electricity Substations

The University of Strathclyde Power Networks Demonstration Centre (PNDC) is a research, demonstration and deployment centre for emerging electrical power system technologies and accelerating smart grid implementations. Founded by government, industrial and academic partners, the facility provides a realistic electrical network test system, and plays a leading role in the development of a smart electricity grid and the acceleration of low carbon technology.

To realise the transformation towards a smart grid, they have introduced a next generation communications platform which makes use of sensor technologies, and addresses the challenges of security, resilience and efficiency in electricity supply. Their work includes modelling of electricity grids and naval ship power systems, as well as testing new technology with a view to it reaching commercial deployment.

The PNDC research facility



EL-MOTE-TH Temp and Humidity Monitor

As part of this brief, the way in which temperature and humidity is measured inside a primary substation was looked at.

Dr Edward Corr, Asset Management Theme Lead, explains. *"Substation temperature and humidity levels can affect the lifetime and performance of utility assets. The obtained data could be used to assess the potential threats to asset health for a range of equipment and building designs, in particular their vulnerability to environmental conditions."*

Currently, the power utility companies use sensors which require a technician to visit the site to collect data, with associated cost and scheduling implications. Kinan Ghanem, at the PNDC, decided to test, compare and validate temperature and humidity sensors that use various wireless communication technologies, to show how much easier they made collecting this data.

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Kinan explains, *"I was searching for relevant WiFi products that could be mains or battery powered, that would monitor temperature and humidity data remotely, and had threshold alarm functionality. The Lascar EL-MOTE-TH ticked all of those boxes."*

The EL-MOTE-TH connects via the local WiFi network to the EasyLog Cloud service, where it can be managed and monitored remotely from any internet-enabled device. The service offers alarms and acknowledgment, set up of event notifications via e-mail, data analysis and graphical reports. Multiple sensors can be added to the account, and with individual user log-ins, rights and permissions, it's easy to manage and monitor large quantities of sensors across multiple locations.

For test purposes the EL-MOTE-TH was installed in the secondary substation at the PNDC facility.

Set-up was done using a mobile phone, using the EasyLog Cloud app for Android and iOS, and Kinan found this process easy.

He concludes, *"The device's ease of use clearly demonstrated to the Distribution Network Operators that WiFi sensors are a viable alternative to the current data collection methods and we plan to use the EL-MOTE-TH in upcoming tests and demonstrations."*

The EL-MOTE-TH being tested in the secondary substation

"I feel the EL-MOTE-TH provides a clear demonstration of the benefits that the latest cloud-connected IoT sensor technology can bring to the electricity industry."

Dr Kinan Ghanem, Communications and Systems Integration Theme Lead, Power Networks Demonstration Centre, University of Strathclyde