CASE REFERENCE · HEALTH & LIFE SCIENCES

Capital Hospitals

FDX - Custom Electronics

Capital Hospitals	Health & Life Sciences	Design · Develop	• ESP32 • MQTT • InfluxDB • Grafana
CLIENT	INDUSTRY	DELIVERED AS	

FIRST DIGITAL IOT

Keeping pharmaceutical fridges in spec at Capital Hospitals

A bespoke, five-year-battery monitoring device that watches pharmaceutical fridge temperature and humidity, and reports breaches to the right people automatically.

01

THE CHALLENGE

Capital Hospitals store medicines in calibrated fridges at temperatures set by their suppliers, and they have to report any breach of those limits to regulators. Unplanned outages and prolonged loadshedding can push a fridge out of spec, and someone needs to know the moment it happens.

02

THE APPROACH

We designed a custom solution built around a bespoke ESP32 device with a five-year battery, so maintenance stays low. The device sits in a custom enclosure, takes regular temperature and humidity readings, and holds a deep-sleep, low-power state in between, with Bluetooth for firmware updates. Readings go securely to a local MQTT service that doubles as an edge buffer, then on to the cloud for processing and storage. InfluxDB holds the time-series data for configurable Grafana reports, and an event-driven design raises notifications from AWS Lambda whenever readings drift outside their limits.

03

THE OUTCOME

Capital Hospitals ended up with a low-maintenance, redundant monitoring solution. Temperature and humidity are watched around the clock, the local buffer means nothing is lost if the connection drops, and staff configure their own rules, limits and reports through a secure web interface.

04

SUMMARY & BENEFITS

- ✓ Low-maintenance temperature and humidity monitoring for pharmaceutical fridges.
- ✓ Configurable rules, limits and event notifications through a secure web interface.
- ✓ Local buffering for redundancy, with a performance-optimised time-series database.

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