



## Case Study:

### Temperature Monitoring and Control for Fridges and Freezers

## Executive Summary

A business imperative for all stores that sell pre-cooked, frozen and refrigerated food products and cold beverages is to **ensure that products are stored in optimal environmental conditions to preserve quality and ensure customer satisfaction**. For products subject to formal regulation, it may also be a required that historical temperature **data is logged and stored for compliance reasons**.

Argility is able to ensure that this goal is achieved by deploying our IoT management solution, Skydata. The Skydata platform will:



Constantly monitor the fridge and freezer temperatures



Log historical data



Alert when thresholds are breached



Generate reports and dashboards available to authorised users

## Business Challenges

As stores move to introduce new refrigerated and frozen food products to meet the growing demand, they need to **ensure that environmental conditions are monitored and kept at optimal ranges**. They must also ensure that they **comply with any regulations** specifying temperature ranges at which different food products must be stored and **keep a record of the temperature readings**.

If the specified storage temperature range is breached, the relevant stakeholder must be informed immediately by a SMS message. This will allow for **corrective action to be taken immediately** and **prevent products from being damaged or compromised**. This will also **prevent the loss of the stock or risk to the health of the customers**.

Generally, fridges should operate in a range of 0°C and 5°C, and freezers in a range of -18°C and -25°C. However, each fridge and freezer is registered on the Skydata platform individually, and **anyone can have its own unique temperature range settings if required**.



## Proposed Solution

Argility will supply the **IoT remote monitoring devices** for installation into all the designated fridges and freezers that require monitoring.

The device is about the size of a smart cell phone and is usually **securely attached to the top of the fridge or freezer**. It has a temperature probe connected, which goes into the fridge to monitor the internal fridge temperature. The device is powered by three internal batteries that should last for five years or more. It **provides constant, uninterrupted monitoring, '24/7/365'**, without any human intervention.

The IoT monitoring devices will communicate temperatures to Argility's Skydata IoT cloud platform, every 15 minutes, using the Sigfox communications network. Utilising the Sigfox network means that **there is no requirement for GSM sim cards**.

Once data is communicated from the IoT devices, the **Skydata IoT platform** will take care of **device management, business rules, security, alerts, notifications** and **storing and managing of historical data**.

Given the device-agnostic nature of the Skydata IoT platform, **any future monitoring business needs** can be satisfied by **deploying additional IoT devices and sensors** into the physical environment, which can then **feed additional data points** into the platform without requiring another software platform. For example, these could be humidity, pressure, CO2/air quality, water or electricity usage, GPS location and more.

## Business Rules

Based on the general business case and goals, the following business rules can be implemented. Rules are configured on the Skydata IoT backend application and can be set to suit specific requirements.

### General rules

- Battery low alert (*high severity*)
- Not reporting for two hours alert (*high severity*)

### Freezer rules

- Temperature under -25°C for more than one hour (*high severity*)
- Temperature over -15°C for more than one hour (*high severity*)

### Fridge rules

- Temperature above 5°C for more than one hour (*high severity*)
- Temperature under 0°C for more than one hour (*high severity*)
- Temperature above 5°C for more than two hours (*critical severity*)
- Temperature under 0°C for more than two hours (*critical severity*)



**Critical severity** - rules to send notifications via SMS and email



**High severity** - rules to send notification via email



**Medium severity** - rules to send notification via email

## Reporting

Access to real-time dashboard and daily/monthly exception reports will be made available to designated people.

Three reports will be sent by email daily:

- **Exception summary report** – provides a summary of min, max, and average temperature per asset, including any recent alarms raised.
- **Alarm report** – provides a list of any threshold breaches as per the threshold rules defined.
- **Daily temperature report** – provides a list of the temperature readings for the preceding 24 hours – compliance report for inspectors.

The three reports will be scheduled and emailed every morning to each store. If appropriate, also to each regional. They will contain data about any stores or devices under the regional management.

All data will be kept on Skydata for a period of three years and will be made available if and when required.

## Key Features and Benefits

- Web-based administration, configuration dashboard and third party device management
- Secure user and role based authentication and notifications
- Scheduled and automated extracts and reports
- Multiple pre-integrated wireless and wired devices and sensors
- Communicate wirelessly via long range battery powered device
- No connection is required to electrical circuit – fridge can be moved without affecting the device
- Sigfox network means there is no requirement for GSM sim cards, so network and connectivity costs can be kept to a minimum
- Cross platform mobile friendly data visualisation dashboards (Android and iOS)
  - Dashboard summaries and drill down features
  - Ability to view data across multiple stores
  - Ability to view detailed data points within a specified store/location

## Use Cases

Supermarkets and specialty food stores

Liquor stores, taverns, bars

Restaurants

Individual -, chain -, mall - and hyper stores



## Value Adding Services

At Argility we are positioned to support our customer's every business need. Please talk to us if you need additional services like the ones listed below.

- Customised Solution
- Development and Support
- System and 3rd Party Application Integration
- Infrastructure and Middleware Management
- Service Delivery Management and Helpdesk
- Professional Services
- Procurement and Configuration
- Technology Consulting (Virtual CTO/CIO)

For further information - [www.argility.com/skydata-iot/](http://www.argility.com/skydata-iot/)

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