The ROI of IoT in Refrigeration

Leveraging the power of IoT connectivity for Refrigeration and Ice Machines

The Internet of Things (IoT) technology has grown so rapidly that it has already eclipsed conventional technology systems in terms of features and functionalities.

IoT's applications are revolutionizing businesses, especially in the Food Service, Health Care and Cold Storage sectors. One such application of IoT is remote temperature monitoring, specifically in refrigeration.

When a refrigerator is exposed as an IoT object, it interacts with the items stored within, gathers information about them, smartly processes this information into relevant data and later conveys this data through an IoT platform to its owners. In other words, it transforms a refrigerator from just a simple piece of equipment into a smart one.

For many industries, monitoring of cold storage is an absolute necessity. Often, the contents held in cold storage can be worth quite a bit, and it is vital that these contents remain at a sufficiently low temperature to avoid being rendered unusable or causing any kind of contamination.

Quality systems and in particular certain government and or federal regulations often demand that the temperature in a cold storage facility, no matter how big or small, be fully monitored and documented.

Looking at refrigeration systems alone as a common denominator in the industry, you already need to deal with many different variants in refrigerants such as ammonia, CO_2, freon, natural refrigerants (propane/isobutane), glycol and even water and ice banks, all of which require different solutions in measuring and monitoring.

To ensure consistent monitoring and management of any refrigerated equipment, an IoT Solution will ultimately assist in managing this more effectively, not to mention more smartly.

There are 3 main methods currently used to monitor refrigeration temperatures, namely:

- Manual thermometers
- Data Loggers
- Wireless IoT devices

Thermometers

Thermometers have been utilized for many years and are the simplest way to monitor fridge and freezer temperatures.

Typically, it would require a technician to inspect each fridge or freezer a minimum of twice per day and then log the recorded reading from the thermometer in a logbook.

Although the task of taking and recording the temperature measurement is a simple one, other drawbacks can make this method a less desirable option. While the upfront outlay for a thermometer is low, often the personnel costs of paying employees to measure and record this information on a regular basis can become quite costly and time consuming, especially if a facility has several cold storage facilities that require monitoring. Ultimately this task could take up several hours per day, and result in a higher than usual operational cost.

Furthermore, while storing logbooks for record keeping is entirely viable, this method is the most vulnerable to human error. The reliability of data logged can be affected by factors as simple as whether the instruments are positioned in a manner that allows for easy reading, or whether the lighting in each area is adequate to view the instruments clearly.

Finally, manual recordings have lower levels of reliability than other types, as they could easily be tampered with in the instance of a regulatory or liability action.

Data Loggers

A Data Logger is a simple instrument that measures and records temperature readings digitally. These instruments offer continuous monitoring of freezer or fridge temperatures and can sound an alert when temperatures are out of specification.

Data loggers are quite often, more expensive than the traditional manual thermometers, but they do offer a significant advantage in that they provide continuous

monitoring and storage of data. They can also be configured to sound an alarm for out-of-range temperatures. The data saved by a data logger can also be downloaded and stored using an external memory device, or they can be connected to a local area network.

These electronic instruments can store a lot of information and information can easily be retrieved for any regulatory compliance requirements. What data loggers typically aren't set up to do is to send an alert to users remotely for out of temperature conditions. They are also not usually set up to make data available in the cloud for easy access.

Wireless IoT Monitoring

With no wires or connections required, wireless IoT monitoring is simple to set up. Each element runs on battery power and can connect directly to the internet, and to a bespoke data portal in the cloud.

Through the portal, the user can view and monitor equipment in real-time as well as receive immediate email or SMS alerts for out of spec temperatures.

This method circumvents the risk of human error, is able to store data for lengthy periods, continuously monitors equipment and immediately alerts users when out of spec conditions are detected.

Data is stored securely in the cloud and is simple to access for regulatory requirements. Where battery power is low or connectivity issues occur, users receive alerts, ensuring no data is lost. IoT technology is fast becoming an integral part of commercial refrigeration, providing powerful new capabilities.

The applications of an IoT remote temperature monitoring system are extensive, which is why they are fast becoming the more preferred method when it comes to monitoring temperatures in refrigeration. Here are some benefits that remote temperature monitoring systems offer:

- Instant Notifications and Alerts
- Predictive maintenance
- Remote Diagnostics
- Real-time monitoring
- Increased Efficiency
- Inherent Connectivity
- Maintain Regulatory Compliance

Conclusion

The Internet of Things is shaping the way we interact with objects daily. Its impact spans a wide range of business sectors.

For the Refrigeration sector, IoT means better managed, maintained, connected and efficient equipment. Ultimately it is about more than just a connected system – it means a smarter environment engaged in constant communication. All of which reduces operational down time and inefficiencies.

Fastcomm's IoT Solution

Fastcomm's IoT solution is intuitive, reliable, and cost-effective. All equipment fitted with our IoT sensors can be monitored and managed from anywhere, at any time, which frees up manpower and time, allowing employees to focus on more important job responsibilities.

In addition, making use of our innovative remote monitoring solution will provide an improvement in real-time control for businesses of all sizes, from commercial kitchens, to health care labs. Our IoT solution provides visibility of temperature-controlled environments and assets, so managers can make more informed decisions and react to problems before they happen.

The Fastcomm solution consists of wireless sensors, gateways and monitoring software that offer a complete remote monitoring solution. Wireless sensors can be used for refrigeration monitoring as well as integrate with existing equipment to provide real-time visibility of the health and performance of refrigeration systems. The Fastcomm wireless gateway acts as a communication bridge between the wireless sensors and Fastcomm's cloud based remote monitoring platform known as **Hellothing**.

Through the Hellothing platform you can view sensor information from anywhere, at any time via a computer, tablet, or smart phone. The platform can also alert you immediately by email and/or text message if conditions that you set are met or exceeded. The wireless sensor network (WSN) can be expandable from a single local area to a multi-site network with sensors anywhere in the world. The gateway will then transmit the data to the Hellothing platform which allows you to configure, monitor, and manage all your locations, and invariably all your equipment, from one network.

Smart Connected Refrigeration Monitoring

Our solution enables you to optimize your refrigeration efficiency. Save energy without compromising food safety, prevent financial loss due to refrigeration failure, prevent food contamination due to temperature spikes, and comply with required HACCP regulations.

In addition, these units can function as full retrofit installation with temperature probes installed, or interface with Danfoss refrigeration controllers.

How it Works
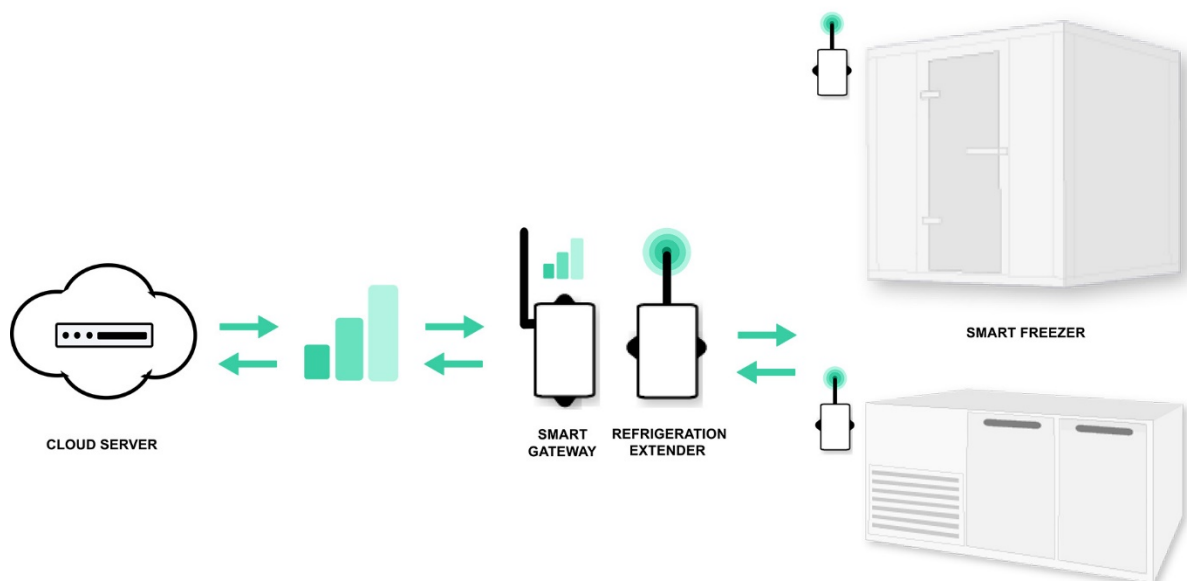
Smart Features

- Real-time monitoring and diagnosis
- Immediate notifications
- Reduce or eliminate operational downtime
- Dashboard views
- Enables proactive servicing
- Time-to-clean scheduling
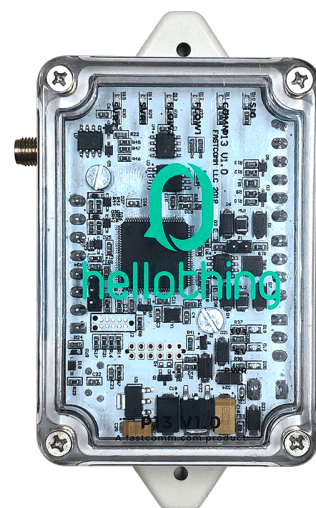
The Fastcomm Advantage

Fastcomm's business is to build technology platforms that empower its clients to digitally transform their businesses and therefore to understand and address the growing needs of their customers. Our mission is to build long-term technology partnerships that help transform companies, allowing them to concentrate on their core business.

We have a proven track record of understanding disruptive technologies and the effect that they have on businesses. We have built platforms in the IoT and OTT technology domains that allow us to connect people, places and things successfully.

The Fastcomm group of companies have been providing solutions to its partners, since 2002. We have offices in the USA, Europe and South Africa, allowing us to produce innovative solutions, utilizing know-how and skills acquired worldwide. Our skilled engineering teams have, over many years, created platforms and building blocks that allow for rapid development and deployment of solutions.

References

East West

Cold Link