



Topic

The Internet of Things and The Evolution of Refrigeration Plant Aftercare

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The Internet of Things and The Evolution of Refrigeration Plant Aftercare

Jeff Gurnett, Star Refrigeration Regional Manager –North, talks about the real benefits the Internet of Things bring to the efficient and safe provision of planned preventative maintenance of industrial refrigeration equipment through smart monitoring of live data, automated control over multiple plants across the country, and schedule works via the interconnection of smart devices.

engineering industry. Over the past decade, leading maintenance providers have embraced and invested in this rapidly evolving technology to stay ahead of the field and boost customer loyalty with predictive aftercare. In turn, this high tech data-centric service has enabled plant operators to achieve the best return on their investment by increasing efficiency and reducing whole lifecycle costs.

The Origins of The Internet of Things



The concept of 'The Internet of Things' has been described as the fourth industrial revolution after steam, mass production and the internet.

The Internet of Things (IoT) is essentially the interconnection of smart electronic devices via the internet. There are estimated to be over 26 billion IoT devices worldwide, exchanging data through online platforms and software systems.

Today the IoT has become a fundamental feature for companies leading the way in the refrigeration

The origins of the IoT revolution saw the development of smart engineering technology and the launch of new added value services to help customers improve efficiency and cut maintenance costs. Over the past decade, many aftercare providers introduced online digital control systems and electronic diagnostic tools designed to alert engineers to plant faults and failures. These modern tools have enabled maintenance companies to deliver more efficient aftercare, reducing downtime and repair costs for customers.

Predictive Maintenance and Asset Management

The IoT has undoubtedly shifted the focus of refrigeration engineering, transforming the service from preventative maintenance, to predictive asset management. Techniques such as remote monitoring and automatic, real-time data analysis are now used as part of a high tech predictive maintenance programme to boost energy efficiency, optimise plant performance and reduce equipment lifecycle costs.

In recent years the concept of predictive maintenance has expanded exponentially through the use of a diverse range of IoT devices and the development of faster, more reliable mobile networks. Predictive maintenance requires enhanced connectivity between IoT devices using sophisticated software systems and online data platforms that can be accessed from any location.

Data-Driven Aftercare Services

For forward-thinking maintenance providers, the IoT has become fundamental to day-to-day operations in supporting and protecting each customer's key business asset. Aftercare has evolved into a data-driven, software-centric service, with the capture and analysis of real-time, actionable data at its heart.

At a basic level, the field engineer's toolbox now features a wealth of IoT devices such as electronic gauges and diagnostic tools, which are essential features of modern maintenance programmes. These simple-to-use digital instruments linked to transducers, sensors and probes, accurately measure the required plant data and upload the information for automatic analysis via an app on the engineer's mobile phone.

This streamlined process enables maintenance engineers to survey each plant and submit key operational data direct to the CMMS database. Software automatically analyses the data and generates an instant alert if a pending component fault or failure is detected.

The system automatically creates a list of required actions and triggers a work order via email to the engineering team. Field engineers undertake the required work on site and submit the work order report via a mobile app on completion. The CMMS dashboard is instantly updated and shows whether any further action is required, whilst the customer is kept fully informed via email throughout the process.

24/7 Remote Monitoring

Remote monitoring is one of the key developments in IoT technology and has changed the face of industrial refrigeration maintenance as a service. This sophisticated technology provides refrigeration engineers with a phenomenal amount of information and leads to significant cost savings for customers. Central to plant maintenance, remote monitoring is conducted online and allows engineers to review every aspect of plant operation remotely and around the clock.

Fault alarms and alerts generate automated emails to engineers who can dial in to the plant's control system via smart phone or computer to address the issue through a technical adjustment or reset. This online access to plant controls enables engineers to deal with a large number of maintenance issues straightaway remotely, without the need for a site visit.

With 24/7 remote monitoring of alarms and alerts, many engineering issues can be resolved quickly and effectively online. Alarm and alert data is recorded, presenting the engineering team with all the information needed for effective decision-making to ensure the fastest route to resolution. This ensures minimal disturbance to customer operations on site and reduces the need for costly call outs.

Real-Time Data Analysis

The IoT has underpinned a further level of remote monitoring involving constant recording of key operational data and performance trends, with expert offsite analysis and reporting. IoT devices capture and record real-time data from connected equipment sensors. Specialist software automatically monitors and analyses plant performance data, quickly identifying failure patterns and recurring issues.

When the system highlights that operating conditions are trending outside the specified parameters, engineering experts are able to accurately identify component failures and operational issues. Data is reviewed and a remedial task list is created for field engineers to attend to during site visits. Task lists are focused on proactive maintenance activities such as technical adjustments, corrective actions and investigations to improve operation efficiency and minimise downtime.

Refrigeration engineering experts are also able to apply predictive analysis to real-time data captured through remote monitoring. Analysis of data on performance trends enables engineers to produce predictive analytic models, which forecast the future status and repair needs of components and equipment. This valuable insight leads to predictive maintenance planning to optimise plant performance and reduce running costs.

Refrigeration plant operators can now benefit from a further development in remote monitoring technology and asset management as part of a proactive and predictive maintenance programme. A highly sophisticated software system can be employed to analyse energy usage data and create algorithms, in order to optimise efficiency. This in turn helps operators of large cooling systems to achieve substantial energy savings.



Ethos Live Remote Monitoring Dashboard

The Ultimate in Aftercare

Combined with the development of modern tooling techniques, the IoT has revolutionised plant maintenance for the benefit of customers and service providers alike. For data-driven maintenance providers, the value of embracing the IoT is an ability to deliver streamlined predictive aftercare and software-centric asset management.

The future for the refrigeration engineering industry will see further investment in data analytics and the development of software and online portals to seamlessly interact with IoT devices in the field. This will shape the ultimate in aftercare, focused on maintaining refrigeration plant reliability, boosting energy efficiency, reducing running costs for customers and maximising the operational life of the plant.

Find out more about our [planned preventative maintenance](#) and [smart monitoring](#) services

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