



Commercial Rooftop Chiller Monitoring

Air-Conditioning and Refrigeration Company

CASE STUDY

The Overview

A world leader in air-conditioning and refrigeration solutions partnered with [Exosite](#) to develop its remote monitoring system for rooftop chillers used in large commercial spaces. Working with Exosite, they were able to develop a highly secure solution that improved the efficiency of their service technicians, increased their share of service contracts, and generated valuable product data. For their customers, the solution helps reduce downtime and increase satisfaction.

The Opportunity

In the air-conditioning business, commercial rooftop chillers are often sold to customers with add-on service agreements to monitor and maintain the equipment when issues occur. However, for our customer, a high percentage of their customers were buying their equipment but engaging in service contracts with other lower-cost providers.

Fulfilling support contracts was also a fairly time-consuming and inefficient process for them. Customers had to call to report that a chiller wasn't working, and technicians entered a job site blind to the potential problem. Because of this, technicians might not have the appropriate tooling and parts to fix the issue, resulting in multiple visits and potentially lengthy downtimes for customers.

Our customer saw an opportunity to address these challenges with a solution that could monitor their commercial chillers remotely utilizing Internet of Things (IoT) technology. In order to be successful, they needed to develop a solution that was:

- **Highly secure.** As a critical part of building infrastructure, connected chillers would need to meet strict security requirements in order to protect customers and ensure safety.
- **Easy to integrate.** Our customer already had an IoT platform in place, so a remote monitoring solution would need to easily integrate with their existing technology.

The Solution

Our customer selected Exosite as an ideal software technology partner to help develop its remote chiller monitoring system. Exosite's [ExoSense® condition monitoring application](#) provided the highly secure software solution they needed, so they could feel confident about keeping their customers safe. It was also easy to set up and integrate with their existing technology, enabling them to quickly develop a new solution on top of the system they already had in place. And, the flexibility of ExoSense meant they could customize the solution to fit their unique mix of customers, business systems, and technologies.

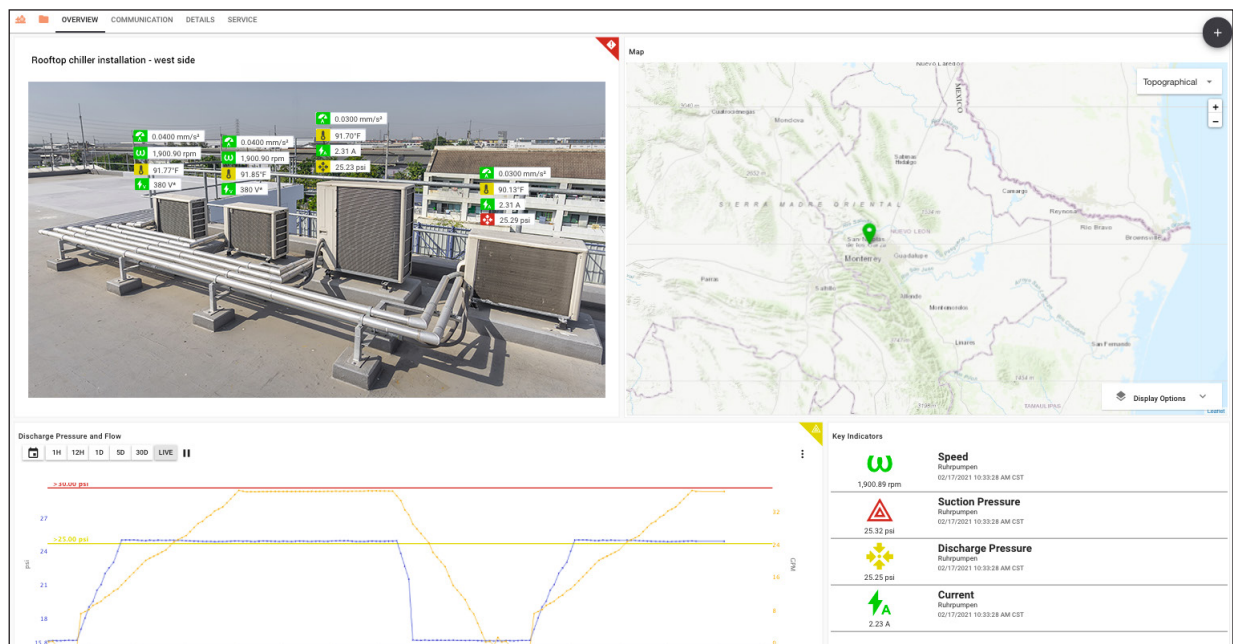
The remote chiller monitoring system includes sensors on rooftop chillers to collect data on temperature, vibration, current status, and failure modes. Sensor data is sent to a local controller and then to a gateway that is rated for temperature, shock, and vibration specifications to withstand the harsh environments these commercial chillers are subjected to.



The Solution (Cont.)

The gateway leverages a custom chiller application developed by Exosite to collect data from the controllers on each chiller and securely transmit it to Exosite's platform using TLS.

In the Exosite platform, the data is aggregated and visualized using the ExoSense® application, where technical experts can monitor the real-time status of each chiller. Pre-set thresholds can be set to identify when equipment metrics become out of spec, and alerts are proactively sent to technicians to help them schedule maintenance prior to a machine failure. Using the available real-time data, technicians can also complete root-cause analysis of issues to ensure they are prepared to fix issues on the first service call.



Leveraging the ExoSense device management capabilities, technicians are able to sort customers by name, location, type of chiller, and software version to help them determine the health of thousands of chillers in the field. The solution also has:

- **Message queueing capabilities** to retain the order and timestamps of messages in the event of power or connectivity outages to ensure data integrity.
- **Over-the-air (OTA) update capabilities** via SSH with a private key to ensure modem software can be updated securely without the need for a physical service visit.
- **An established provisioning process** with a pre-shared key and SSL encryption that is completed when devices are manufactured to ensure the utmost security.

The Results

For Our Customer

Customized a secure solution to meet their exact needs.

Based on Exosite's security capabilities, our customer was able to create a secure integration between the Exosite platform and Microsoft Azure's IoT Hub, where they could do stream analytics, storage, big data, and data analytics.

Improved share of service contract revenue on equipment.

Adding connectivity enabled our customer to develop service contracts with proactive monitoring and maintenance not available through other providers. As a result, customers are driven to engage with them, rather than with other low-cost service providers.

Enhanced technician-related efficiencies and remote-service capabilities.

Remote monitoring enables technicians to diagnose issues in advance, reducing the meantime to repair on equipment. They can also monitor more chillers with fewer people and complete OTA software updates remotely with no physical service visit at all.

Created a valuable engineering resource for data discovery.

Our customer can use the connected chillers as a test platform to collect engineering data on units and complete diagnostics on product function in the field. This information provides powerful insight that can be used to improve product performance and functionality..

For Their Customers

Reduced downtime.

Our customer's predictive maintenance capabilities allow them to reduce the amount of unexpected downtime for their customers. They can also select optimal times for maintenance, rather than waiting for equipment to break down.

Improved satisfaction.

Because technicians have a better understanding of equipment health, they can now engage with customers to better meet their needs. Customers have more confidence in the level of service they are receiving and, as a result, experience higher levels of satisfaction that relate to continued engagement in service contracts.

About Exosite

Since 2009, Exosite LLC, has pioneered IoT software solutions. Based in Minneapolis, with offices around the globe, the Exosite team possesses a wealth of experience and expertise in IoT technology and business strategy. Exosite engages with leading manufacturers, providing complete connected solutions, an enterprise software platform, and a rich ecosystem of tools and partnerships to quickly guide connected-product concepts to marketable IoT applications. Visit www.exosite.com to learn more about how Exosite powers digital transformation.

**Interested to see if Exosite can
expedite your IoT success
story?**

**Connect with our team of IoT experts
to learn more.**

exosite.com | info@exosite.com | +1 612.353.2161