



PARTICLE

watsco

How Watsco is Building a New Business Model With IoT

Case Study

particle.io

Executive Summary



Problem

Watsco wanted to create an “HVAC check engine light” that would let contractors and system owners diagnose and report on A/C system issues before an outage to reduce unnecessary truck rolls. Yet, building IoT capabilities in-house proved difficult, as connectivity was unreliable and the device certification process was too long.



Solution

Watsco Director Mario Cruz began building prototypes of A/C sensors on Particle’s platform, and quickly realized that the Particle platform made it much easier to bring a connected product to market at scale. Particle abstracted all the complexity of building an IoT product, and allowed Watsco to focus on solving customer problems, not fixing connectivity issues.



Results

Watsco is now able to help homeowners and HVAC contractors monitor their A/C systems 24/7 with their Sentree product, which Particle helped build. In just 16 months, Sentree has connected over 2000 A/C systems across the US with 600M data samples collected and over 500 A/C issues identified and fixed before service disruptions occurred. As Watsco continues to innovate with Particle, more contractors are signing up to use their connected products.

The Company: Watsco

Watsco is the largest distributor of air conditioning, heating and refrigeration equipment and related parts and supplies in the HVAC/R industry.

Watsco has built a national network of HVAC distribution businesses across North America. With over 560 locations, Watsco’s four subsidiaries bring a diverse product base of top-quality HVAC/R equipment and supplies to customers across the US, Canada, Mexico, and the Caribbean.

“We’ve been a Particle partner for four-and-a-half years now. Particle takes care of the cellular, the security, the infrastructure — all of it — it just works.”

Mario Cruz

Director at Watsco Ventures

2000+

Systems Online

600M+

Samples Collected

500+

HVAC Issues Caught

Problem

Building The 'Check Engine Light' For Hvac

A/C systems can run into several problems between service visits, such as refrigerant leaks, improper pressure, or electrical issues.

Six years ago, Watsco leadership was ready to address these issues proactively. The thesis was simple: If you can create a "check engine light" for an HVAC system that can diagnose and report issues remotely, can you replicate what a technician would do when he or she goes on-site, uses gauges to check system performance, and reports issues back to the manufacturer or contractor?

It had to be something that could monitor A/C and other HVAC systems' performance, send the data to the manufacturer and contractor, and make it easy to diagnose issues without requiring a truck roll.

That's when Watsco hired Mario Cruz as a Director in charge of creating IoT-enabled HVAC systems. Mario joined the team and began tackling the problem of adding IoT connectivity to Watsco's systems.

"When I took over, we built our first board and built prototypes on our own just to see what data we could get," Mario said. "From the start, we had nothing but problems with the modems. With the connectivity issues, I knew we couldn't sell what we had."

To solve the connectivity issues, Mario bought WiFi modules to replace the modems. This worked but created a new problem. If the system owner's WiFi went down or if they changed the password, Watsco would lose all ability to receive data from the system. Additionally, WiFi connectivity made the system susceptible to hackers or bad actors.

Another major issue was over-the-air software updates. When Watsco was trying to build its own IoT infrastructure, over-the-air software updates would consistently be a source of problems.

"Over-the-air updates were brutal for us before," Mario said. "Every once in a while, someone would send me a warning that a device was bricked and needed to be rebooted. Nobody wants to have to call a customer and ask them to go turn their air conditioner off and back on."

After several months of hitting roadblocks trying to build and scale an IoT deployment, Mario and his team found a solution.



Solution

Scaling an HVAC IoT Deployment With Particle

A technologist and hobbyist, Mario had been using Particle for personal projects. After finding the Particle platform easy to use and robust enough for different types of projects, he realized he could use it to solve some of the problems he was facing at Watsco.

Mario moved his code onto a Particle Electron and ran the device for a few weeks. Then he built a few more. With each additional device, he felt that he was onto something. His team wanted him to build 100 harnesses as a prototype. Since it took Mario three days to build one harness, it would take him almost a year to build 100. That's when he reached out to Particle.

Watsco partnered with [Particle Studios](#), Particle's in-house professional services team, to support the design, development and production of the harnesses. With the support of the Studios team, Watsco could get 100 harnesses built quickly.

This allowed Mario to test the original thesis: How much data could he get off these devices installed on his own personal HVAC system and how well did that data predict system breakdowns?

"We found that the data could actually predict when a breakdown was coming," Mario said. "The rest is history. We could build a business case around what we had with Particle."

The Particle Electron allowed Watsco's team to connect to the Internet over 3G. As the deployment scaled, they transitioned to the Particle E Series, an industrial-grade module, that allows them to connect to the Internet over an LTE cellular network, significantly improving performance.

The power of Particle as an integrated IoT platform made it easy to get hardware, connectivity, an operating system, and software right out of the box, without having to build it in-house or make multiple microservices and vendors work together.

Watsco, an HVAC distributor, primarily sells equipment to contractors, who install the systems for residential and commercial end users. When Watsco showed the connected systems to their contractors, they loved the concept but were unsure about the business case at first. How could this help them?

As the early adopters of the connected systems rolled them out, the value became apparent. They realized that they would be able to diagnose customer issues remotely and send the right technician for each job while reducing unnecessary truck rolls.

Now, contractors don't have to send senior techs to handle minor issues that can be handled by junior ones. With the ability to track multiple error and failure states remotely, they don't have to use an expensive truck roll to handle a minor, unprofitable service call.

Additionally, the features offered by the Particle-enabled equipment unlocked new business models for the contractors. They could offer HVAC systems to their customers for an upfront cost, and then generate monthly recurring revenue by offering regular maintenance and data that helps users make better decisions about their systems and protect their assets.

Results

Fewer Truck Rolls, Smarter Resource Utilization, Happier Contractors

The initial success of the new products validated the business case for IoT, and led Watsco to acquire Alert Labs as an industrial/mechanical engineering firm that would design and manufacture the products.

Watsco is now able to help homeowners and HVAC contractors monitor their A/C systems 24/7 with their Sentree product. With the Particle platform, Alert Labs, a Watsco company, is connecting A/C systems to the Internet so homeowners and contractors can address maintenance issues before they result in an outage.

In just 16 months, Sentree has connected over 2000 A/C systems across the US with 600M data samples collected and over 500 A/C issues identified and fixed before service disruptions occurred.

2000+

Systems Online

600M+

Samples Collected

500+

HVAC Issues Caught

The success of Sentree has allowed contractors to improve customer satisfaction and develop new recurring revenue streams.

Easier Access to Remote System Data



Dashboards for system owners

The platform provides system owners 24-hour monitoring that shows information about A/C performance and status to keep their air conditioners running efficiently.

Dashboards for contractors

Historical data and analytics enable service teams to provide proactive maintenance and repairs which has led to fewer truck rolls, more efficient service dispatches, and increased customer satisfaction.

Results

Fewer Truck Rolls, Smarter Resource Utilization, Happier Contractors

Faster Time to Market

When asked how long the product development process would take without Particle, Mario estimated that it would take about **two years - instead of just a few months - to get the same products to market.**

But with IoT, it's not just about launching the product. Maintenance and support is an ongoing effort.

"Every time you spin up a new revision on a board, you have to spend another three to four months getting it re-approved," Mario said. "If the modem is messed up, or if an update comes out, you basically have to do it all again. We didn't want to spend all our time doing that. It's Particle's bread and butter to handle that."

Additionally, Particle's out-of-the-box integration between hardware, connectivity, and software allows Watsco to focus on what they're good at: Solving problems for HVAC contractors. Now, they don't have to worry about fixing connectivity issues and making different systems "talk to each other."

Particle as a Strategic Partner

Watsco's leadership team has come to see Particle as a key strategic partner for new product development. This has been a result of working together and forging a strong partnership where Particle's agile approach to product development has enabled Watsco to solve many of their specific business problems.

"When we first started working with Particle, our CTO and I sent the team a long list of things we needed that weren't in the platform at the time. Things like two-factor authentication and web hooks. Within a year, about 90 percent of the list was built into the product," Mario said.

"Whenever I've needed something, the Particle team has been incredibly helpful. I can pick up the phone and know that someone is going to help me if I have a problem or a new project," he added.



Work with Particle

Particle has helped market leaders and innovative new companies alike bring IoT projects to life for over a decade. What makes our platform different?

Secure and reliable

End-to-end encryption from hardware to connectivity to cloud, with SOC II and GDPR certifications, public/private key authentication, open event logging framework, encryption at REST, encrypted API messages, and firewall protection.

Scalable

We've helped connect and launch hundreds of thousands of devices, with a fully managed cloud infrastructure processing billions of messages a month and zero planned downtime.

Upgradable

Wirelessly reprogram your fleet of vehicles in the field with our over-the-air (OTA) software updates without any hardware or software scalability issues, and add product features, improve bugs, and avoid vehicle disruption with the push of a button.

Open

Use our APIs and open, referenceable system architecture to access and share vehicle data to multiple different stakeholders of your choosing or integrate seamlessly into existing software architecture without any security hassles.

Global Connectivity

Our IoT-specific SIM card is built into our hardware and is powered by over 350 carriers around the world that automatically connect to the best networks across 2G, 3G, and LTE technologies, designed to make IoT cellular management simple and unified.



All-in-one

A pre-configured network and applications so devices remain online



Secure by Default

End-to-end encryption, limited attack vectors, a firewall-protected cloud, and more



Scalable Infrastructure

Sensor hardware are cloud platform that works the same from your first prototype to your millionth unit



Domain Experts

Developer community, support, & engineering services ready to assist



Data Autonomy

Put your data where you want - integrate with AWS, Azure or anything with a REST API





About Particle

We love helping game-changing HVAC companies build better connected products, get to market faster, and win in competitive markets.

Speak to an expert today



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