

IoT Solution Leverages Real-Time Data to Monitor Concrete Quality

CiDRA's *SMARThatch*™ system optimizes processes and reduces costs

CUSTOMER

CiDRA Concrete Systems, Inc.

TECHNOLOGIES

CANect® Telematics

SERVICES

Over-the-Air transmission, collection, visualization & monitoring

PROJECT TYPE

IoT

INDUSTRIES

Concrete

Overview

CiDRA Concrete Systems has developed the *SMARThatch*™ System featuring AIRtrac technology for real-time information from batch plant to job site. CiDRA partnered with both [HED](#) and [Exosite](#) to develop a connected solution that helps their customers leverage real-time data to enhance concrete quality, optimize processes, and reduce costs.



CASE STUDY



To optimize their operations, concrete producers and truck operators need greater visibility into these key metrics throughout the mixing process in order to identify issues earlier, adjust loads proactively, and provide real-time feedback about concrete quality to the plant.

The Opportunity

Concrete is one of the most widely used materials in the world and is a constant presence in our daily lives. From parking garages and bridges to roads and buildings, concrete forms the infrastructure and foundation for much of our commercial, residential and transportation structures. Given its many critical uses, the quality of the concrete is of the utmost importance.

In order to achieve optimal strength and long-term durability, the perfect combination of aggregate, cement, water, and air must be created for each application. CiDRA Concrete Systems understands the challenges involved with producing concrete and is why they developed the SMARThatch™ system, which features AIRtrac™ technology, giving their customers the ability to monitor the entrained air content in real-time while being transported from batch plant to job site.

Other methods used to monitor air content involve a highly manual process that requires on-site technicians to complete. Testing can only be completed once a truck arrives on the job site, resulting in costly downtime if air content adjustments are required. Test results only provide insight into the quality of a single sample, rather than the entire load, and give no indication about when or how changes in quality may have occurred.

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The Solution

CiDRA partnered with HED and Exosite to develop their *SMARThatch* monitoring system, which is installed on the mixing drum of concrete trucks. As the drum rotates to agitate the concrete, the sensor unit collects data on air content, temperature, drum rotation speed, and volume.

Sensor data is sent to the [HED CANect® Telematics](#) unit, along with an in-cab display for truck operators that provides real-time air content and temperature data that they can access during transit from the batch plant to the job site. The Telematics unit then transmits the sensor data, along with GPS and other key metrics, over the 4G LTE cellular interface to the back office for visualization by remote users. In addition to the collection/transmission functionality, over-the-air reprogramming enables field-based software updates into the future.

The HED Telematics back office utilizes Exosite's platform, where data is aggregated and visualized using the [ExoSense® condition monitoring application](#). From this tool, business owners, quality control personnel and truck operators can view truck-specific dashboards with real-time and historical information that can be used to identify batch issues, enhance quality control coverage, and test new mix designs. Users can also export historical data, receive notifications, see fleet-wide data views, leverage hierarchies to manage customers, and more.

Real-Time Data Monitoring



The *SMARThatch* system can easily be retrofitted to any style of concrete truck and is available for a flexible subscription fee that includes hardware at no additional cost. For concrete producers and truck operators, this solution translates into increased productivity, reduced waste, lower costs, and enhanced competitiveness.



The Results

For CiDRA Concrete Systems:

- Provided speedy deployment
 - By partnering with both HED and Exosite, CiDRA Concrete was able to leverage a pre-integrated hardware and software solution that streamlined their path to the cloud. Rather than struggling with connectivity, they quickly had a fully functioning proof of concept to test with customers, allowing them to focus on marketing and business development for their new product.
- Enabled new recurring revenue stream
 - CiDRA Concrete transformed itself from a traditional product development company into a software-as-a-service (SaaS) company. Rather than a one-time, hardware-based sale every few years, CiDRA Concrete now benefits from recurring software subscription fees.

For CiDRA's customers:

- Reduces downtime and waste
 - Access to real-time air content and temperature data helps operators catch issues early, so they can make adjustments to loads prior to arriving on a job site. Key personnel can also be notified so that subsequent batches are modified to remain within specification.
- Lowers costs and variability
 - With less manual testing, operators save valuable time and additional costs. Also, by continuously monitoring the entire load, rather than random samples, operators experience more accurate test results and less variability.
- Enhances quality control
 - Continuous monitoring provides insight about precisely when, and under what conditions, air content began to change. This can be compared with changes in the production process that may have triggered air content changes. When extended over multiple projects and multiple concrete mixtures, this becomes a powerful tool to help producers enhance quality and consistency.

Solution Benefits



Speedy deployment

by streamlining the path to the cloud with fast connectivity.



Recurring revenue stream

Transformation to SaaS company through subscription services.



Reduced downtime and waste

By catching issues before they happen.



Lowers costs and variability

Through less manual testing and continuous monitoring.



Enhances quality control

Insights can be compared to changes for enhanced product quality.

About CiDRA

CiDRA Concrete Systems has developed the SMART*hatch*™ System featuring AIRtrac technology for real-time information from batch plant to job site. This information includes concrete air content and temperature, volume of concrete returning from a job, hydraulic pressure for slump correlation, revolution counter and timer and drum rotation sensor. Information is available on an in-cab display as well as a cloud-based web portal. It allows producers to reduce rejected loads, improve concrete quality and consistency, reduce costs and better understand their mix designs. Visit <https://www.cidra.com/concrete> to learn more.

About HED

Located in Hartford, Wisconsin, HED, Inc. is a leading designer and manufacturer of electronic controls and telematics solutions for mobile equipment applications. Incorporated in 1986 and privately held, the company maintains a broad, comprehensive line of products to meet the growing and changing needs of the off-highway heavy equipment markets it serves. Whether a simple on-off control for a hydraulic valve or a complex distributed intelligence system for total machine control, HED's mission is to help vehicle designers engineer optimized solutions to challenging vehicle control and monitoring applications. Visit www.hedonline.com to learn more.

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.

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