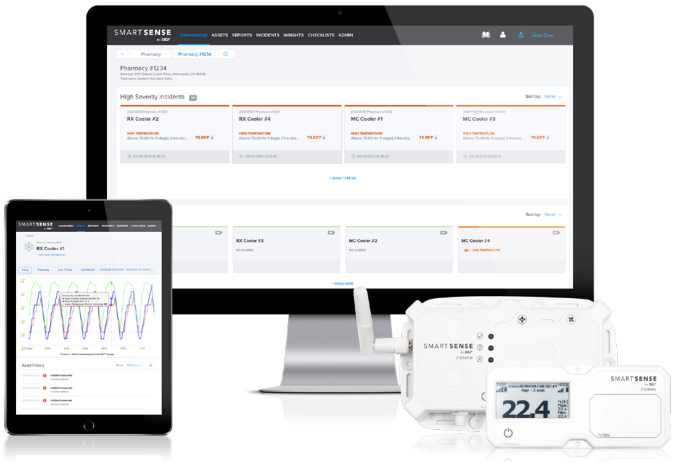
Photo Credits: NASA/Dominic Hart

SmartSense

Real-Time Temperature and Humidity Monitoring

NASA redirects more than 30 minutes of labor per day to critical research by leveraging SmartSense condition monitoring.



NASA's Ames Research Center conducts biomedical research for rodents in microgravity conditions, using proprietary food to provide comprehensive nutrients for mice.

The Challenge

The NASA Ames Research Center facility has many significant responsibilities as it relates to research and development in aeronautics, exploration technology, and science. Among these responsibilities is analyzing the effects of weightlessness on the human body. An effective way to understand these conditions is to run tests on rodents, due to their genetic similarity to humans. Like humans, rodents require food, which presents a unique problem in microgravity. Standard kibble is not suitable, as it will float around and potentially damage sensitive filters and equipment. To combat this issue, Kevin Stube, Project Management Specialist at NASA, and his team has developed a food substitute that requires special storage and handling prior to consumption.

NASA partnered with SmartSense, a leading IoT condition monitoring company, to implement two key capabilities that enable scientists to spend more time working on their research:

- Real-time monitoring to identify temperature and humidity excursions
- Proactive alerting with advanced customization logic

The Solution

Real-Time Temperature and Humidity Monitoring

The Ames Research Center runs tests on rodents to investigate how microgravity affects biological systems, such as bones, the heart, blood flow, and the immune system, in order to better understand how humans can adapt to the long-term effects of space. All variables must be reduced, which includes the diets that the rodents are subject to. If they are not receiving the comprehensive nutrition they need, it can negatively impact testing, which means the research center must control the rodents' diets carefully. The specialized foods are perishable and must be stored in a refrigerated climate for long periods of time.

Before Kevin's team had implemented real-time monitoring, researchers would spend 15 minutes manually logging temperature twice a day, five days a week. Additionally, some refrigerators weren't being monitored at all, exposing the specialty foods to unnecessary risk. With real-time monitoring retrofitted to each of their fridges, researchers are assured that the specialized foods are being held at appropriate temperatures for use in their critical research. As is the case with many research facilities, the Ames Research Center can benefit from any additional time gained for their researchers to perform experiments.

Real-Time, Customizable Alerts

In addition to real-time monitoring, the project management team needed a solution that had a more robust alerting system that includes advanced decision logic. The alerting structure that was previously in place relied on a switch board with a call tree, which offered little customization for determining who would receive specific alerts and alarms. Additionally, their previous solution had a simple alerting structure and lacked multiple levels of alerts.

The Ames Research Center was limited in their ability to respond to temperature excursions immediately in order to prevent compromising their specialty food. Real-time notifications enable the Ames Research Center teams to react promptly to temperature excursions and maintain food integrity.

The Results

Now that the Ames Research Center has a real-time, digital monitoring solution, their researchers have access to capabilities not previously available:

- Access to precise, up to the minute temperature and humidity data
- Proactive alerting with a high-degree of customization that prevents problems before they occur

Thanks to SmartSense, Kevin and the Ames Research Center scientists have peace of mind knowing that their time is being spent on research, not worrying about temperature or humidity excursions. Their specialized food is being monitoring 24 hours a day, 365 days a year.

> *"Thanks to SmartSense, we spend less time worrying about maintaining food quality, enabling us to focus on our core mission: conducting research to ensure that our astronauts are safe from the effects of microgravity."*
>
> *Kevin Stube,*
> *Project Management Specialist,*
> *NASA*

They are confident in their temperature monitoring strategy knowing they have trusted a leading IoT provider. With over 30 years of experience, SmartSense by Digi provides real-time insights to customers who value operational excellence, a top priority at NASA.

1-866-806-2653
www.smartsense.co

SMARTSENSE BY DIGI