



CASE STUDY

ADS Modernizes a Data Acquisition System for an Environmental Test Facility

OVERVIEW

ADS was hired by a government agency to design, deploy and test an upgraded Data Acquisition (DAC) system for their environmental test facility. This effort was crucial for ensuring that the client’s engineers and operators could access and manipulate their test data, and deliver a suite of new features and capabilities that will assist in their mission through the next decade.

THE CHALLENGE

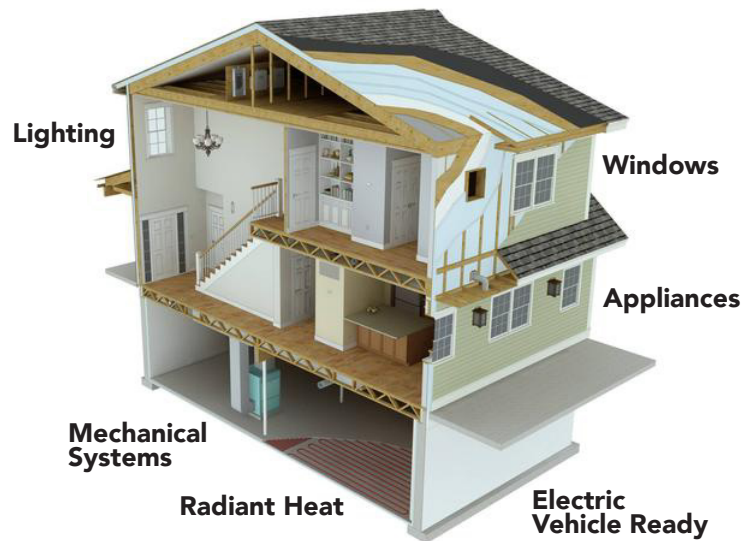
The environmental test facility consists of over 500 sensors and devices, and is designed to simulate a carbon-neutral house and test climate friendly technologies. The system records test data via a Data Acquisition (DAC) system, which consists of a PXIe chassis, an embedded controller, and multiple modules for data acquisition and control.

Due to an obsolete OS and overly complex system architecture, the DAC system had become unstable prior to ADS’ consultation. The client approached ADS to upgrade the DAC system, with the goals of ensuring stable operation of the facility for the next decade and adding new functionalities to improve operator control.

THE SOLUTION

ADS took a phased approach which consisted of planning, designing, developing, integration & testing, deployment & verification and maintenance. For this project, the following phases are required:

- ✓ **Planning Phase:** gathered detailed requirements.
- ✓ **Design Phase:** Designed a new data acquisition system (DAC) architecture.
- ✓ **Development Phase:**
 - Migrating to a supported OS.
 - Upgrading the LabVIEW software.
 - Adding new Open Platform Communications (OPC) server features.
 - Upgrading hardware components.
 - Enabling remote development testing.
 - Implementing cybersecurity standards to enhance network security.
 - Improving the handling of the Domestic Hot Water subsystem.
- ✓ **Integration & Testing Phase:** Integrated and installed the upgraded DAC system and conducted thorough on-site testing.
- ✓ **Verification Phase:** Verified system operation and made adjustments as-needed based on test results.



CONCLUSIONS

By following a phased approach and incorporating feedback from the client at every stage of development, ADS designed and developed a robust DAC system that exceeded the client’s requirements, allowing their engineers to focus on evaluating emerging energy-efficient technologies.

