

University Research Lab Centralizes Solar Field Data With Ignition

Ignition Connects Devices With Historian & Students With Industry

Up close, solar panels shimmer in the sunlight. And as the sun peeks through the morning clouds, there is plenty of shimmering happening on the solar field at the [Louisiana Regional Test Center for Emerging Solar Technologies \(LA RTC\)](#) at the University of Louisiana (UL) at Lafayette. This is one of the largest outdoor solar testing facilities in the Southeastern United States, boasting 4,200 solar panels across six acres, resulting in 1.1 MW of solar energy production. It's enough to power UL Lafayette's nearby stadium, with extra to spare.

Tracking all the data from such a sprawling setup required an equally robust solution. That's why LA RTC collaborated with [The Integration Group of Americas \(TIGA\)](#) to consolidate the data from their solar fields into a unified system, enabling better data management and demonstrating the magnitude of the lab's research. TIGA, with help from UL Lafayette students working at LA RTC, developed the system using [Ignition](#), the enterprise industrial integration platform for SCADA, HMI, IIoT, and more.

A Lack of Interoperability

Before implementing Ignition, RTC struggled to collect and process data due to the highly diverse set of devices, systems, and protocols used in the solar field. "It's been a little bit of a challenge with other vendors



The LA RTC leverages Ignition to monitor, visualize, and centralize the data coming from the field while maintaining complete in-house control and customization over the system.

because we have so many different types of systems here," said Dr. Terrence Chambers, Director of the LA RTC. "That's the nature of being a test lab. And every other vendor that we tried had trouble with that concept."

In addition to a lack of interoperability, the previous system offered limited visualization, storing all data in a cloud-based system without customization options. Not having the ability to monitor day-to-day production meant that LA RTC struggled to achieve the high level of data granularity necessary for completing research projects or quickly addressing maintenance issues.

Establishing an Internship Program

While many of the engineers at TIGA graduated from UL Lafayette, LA RTC personnel first became acquainted with the integration company during an Institute of

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Assistant Professor at UL Lafayette

Electrical and Electronics Engineers (IEEE) conference hosted on campus. “We actually came in to assist with some other electrical services and PLC programming services,” said Ben Gaspard, Manager of SCADA Services at TIGA. “We just so happened to see a cornerstone of like, ‘Hey, what's this? What's this visualization? What are we using?’ And then the explanation of, ‘It's over here and over here and over there,’ that kind of jogged our integrator brain to say, ‘We can help out with this.’ And then it turned into, ‘We should get someone from the university to help out with this.’”

The LA RTC and TIGA discussed the possibility of establishing a workforce training pipeline that would fulfill the test center’s needs for a robust data system while giving students real-world training to help transition to industry. “You rarely get out of school and do the exact thing you were hoping to do, or that you have exact experience in. And this is one of those cases,” said Gaspard. “And to provide that, I think, is very important.”

To establish this two-pronged initiative, TIGA recommended implementing Ignition for the SCADA system. However, funding is always a concern for educational institutions, so

TIGA reached out to Inductive Automation directly. Even though this request predated the launch of the [Educational Engagement Program](#), Inductive Automation responded quickly, offering the Ignition license for free. “They supported us,” said Gaspard. “They were all ears and extremely responsive. It made you feel like they actually cared about what was going on here. And you don't get that very often. It's refreshing.”

Progressing Through the Program

There is a parallel between the cyclical nature of renewable energy and the procession of students through an internship program. Before joining the program, Abigail Boggs, Systems Engineer Intern at TIGA and a student in computer science at UL Lafayette, had little exposure to control systems. “I had no idea what Ignition was or even what SCADA was,” she said. “I got introduced from a member of the lab and they're like, ‘We need somebody to work on the Ignition system, and they need to know some sort of coding.’”

When Boggs first entered the program, she started by working at the LA RTC, learning how the devices functioned in the field. Eventually, she was able to leverage that knowledge to use and improve the Ignition system, serving as the technical communicator who could translate solar panel nomenclature into SCADA data and vice versa.

As Boggs progressed through the program, she began training with TIGA, working alongside industry professionals, and utilizing the lessons at [Inductive University](#). “TIGA fully put me into Ignition and I was

able to directly work on it while having the knowledge of what the testing center needed, specifically,” Boggs said.

The internship program sets up an intentional and consistent pipeline of students, where the work of each graduating intern leads directly into the next. This pipeline also establishes a renewable source of talent for a variety of local industries such as solar and oil & gas. “That’s very valuable for our students, because ultimately, we’re trying to help them get good paying jobs in an industry that they enjoy,” said Chambers.

The benefits of the program extend beyond just what the students themselves are learning. “The best thing about them is that they have no preconceived notion of what a SCADA system should be. And, honestly, that is sometimes the best thing you can get,” said Gaspard.

A Centralized Ignition System

The LA RTC now leverages Ignition to monitor, visualize, and centralize the data coming from the field while maintaining complete in-house control and customization over the system. Using Ignition’s historian, the LA RTC migrated their data into a single MySQL database for easy access. The LA RTC’s inverters are able to collect data and translate it into a device called the datalogger, measuring power and voltage current, which can then be displayed through the Ignition HMI. Additionally, this dashboard features custom KPIs such as the amount of CO2 saved and the number of trees required to match the LA RTC’s production.

While the previous system had a low-frequency data measurement interval, Ignition collects and imports data every six seconds. The availability of real-time data along with the intuitive visualization has improved the LA RTC’s maintenance response time.

Crucial Scalability

Research projects typically evolve between initial funding and implementation, which can be frustrating, but Ignition’s flexibility has allowed researchers to pivot as needed. “Our projects are kind of always changing,” said Dr. Lelia Deville, Assistant Professor at UL Lafayette. “There’s no way to predict in any sort of extended time in the future what exactly our projects will look like. And so we know that we’ll be able to integrate Ignition with it regardless.”

For a solar field this size, Ignition’s scalability and unlimited licensing were crucial. Initially based on one inverter, the Ignition system is designed to easily incorporate additional inverters, enabling data cross-referencing from multiple sources. To standardize and organize the devices as tags, TIGA built UDTs for each device, which allow students at the LA RTC to easily add new devices in the future. This ensures that the system can grow and adapt to meet increasing demands and integrate new technologies.

“There’s always some plans to expand and add new features to our system, especially since we are a regional testing center,” said Boggs. “We’re constantly getting new equipment, new devices, to be able to test and monitor, whether it’s for research or industry.”

Research for a Reason

Beyond the twofold success of the Ignition system and internship program, the collaboration between TIGA and UL Lafayette has resulted in public-facing benefits as well. “Our university has a saying that we do ‘research for a reason.’ And with the tools that are provided to us by Ignition, it’s really easy for us to show the reason for our research, both in cost savings and energy and our impacts on the environment,” said Deville.

The LA RTC frequently gives tours to members of the public, from kindergarten students to local politicians and other members of the university. When tour groups see the Ignition dashboard, they are able to visually connect the data being measured in the field with what the LA RTC is accomplishing in their research.

“Before we had something like this, with the easy visualization, it was kind of hard to communicate exactly the magnitude of what we’re doing. It’s easy to tell somebody that we produce 1.1 MW, but a number without any sort of visualization or something that they can connect to doesn’t really resonate with most people,” said Deville. “Having the dashboard that we can share here, I think it’s very powerful. As researchers, sometimes we get lost in our own world, in what we do, and forget that we have to find a way to communicate that to people. And I think Ignition is helpful in doing that.”

Project Scope

- Start Date: March 2022
- Deploy Date: May 2022 (Ongoing)
- Tags: 4,172
- Screens: 4
- Clients: 1
- Devices: 4 Dataloggers
- Architecture: Standard
- Databases: 1 MySQL
- Historical Data Logged:
 - 7,656,902,941 Total Rows
 - 276 Tags
- Number of People on Team: 5

The LA RTC is one of the largest outdoor test facilities in the Southeast United States, and is used for performing long-term operational testing of various types of solar technologies, including different types of modules, inverters, and racking systems. Research is currently being conducted on solar module degradation, soiling, and solar forecasting. The LA RTC is also used for education, workforce development, and outreach. Learn more:

<https://eese.louisiana.edu/facilities/photovoltaic-applied-research-testing-part-lab>

The Integration Group of Americas Inc. (TIGA) is a US-based systems integration and engineering services company. TIGA believes that systems integration is fundamental to leveraging new and well-established technologies against operational problems that exist within industry verticals. TIGA’s objective is to be the trusted, first-choice service provider

experienced at integrating their clients' control and safety systems, SCADA systems, optimization, and analytical systems. TIGA's services range from field installations of I&E and controls to back-office SCADA systems and customized enterprise applications.

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