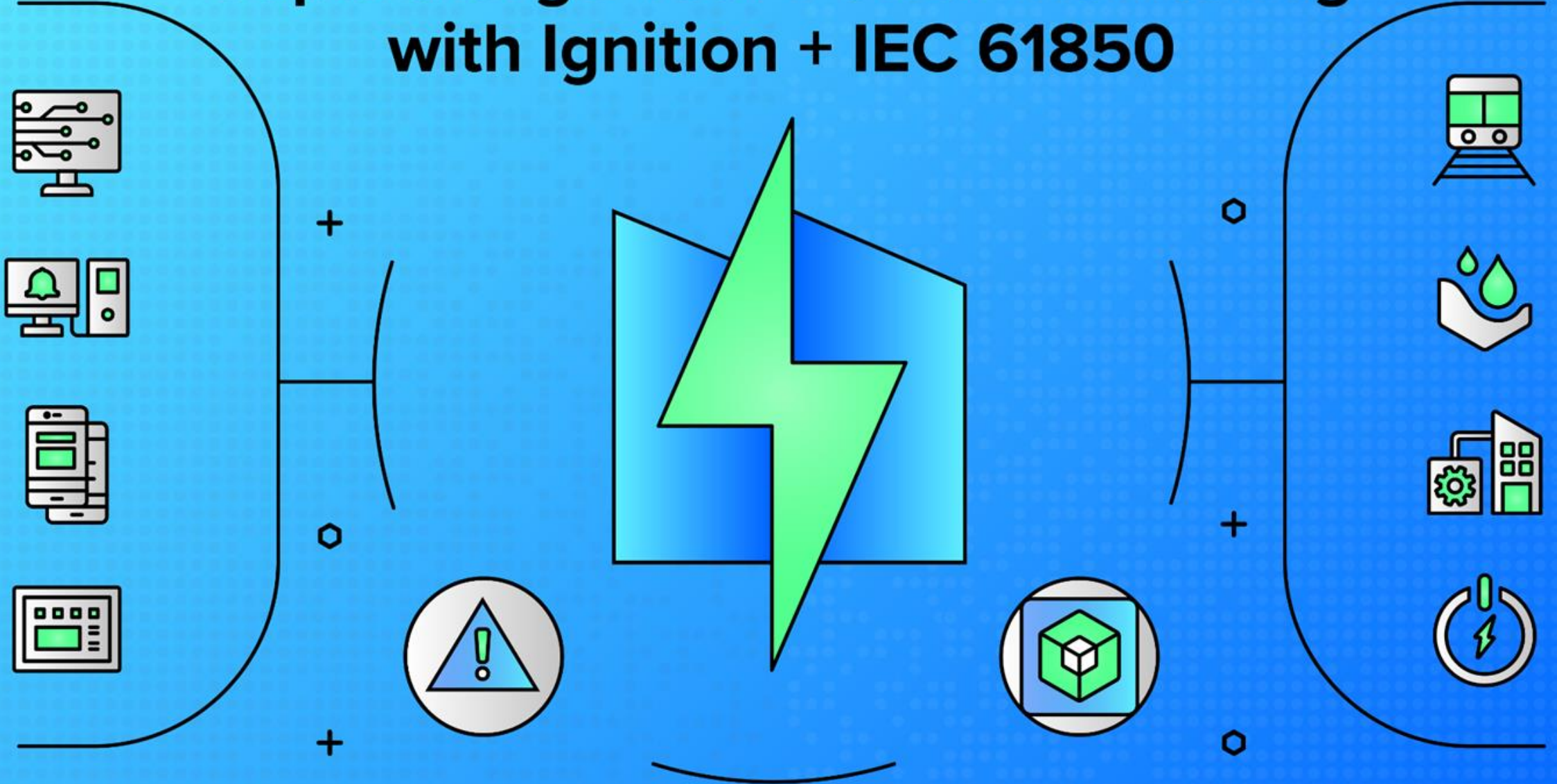


# Supercharge Your Power Monitoring with Ignition + IEC 61850



# Presenters



**Don Pearson**

*Chief Strategy Officer  
Inductive Automation*



**Travis Cox**

*Chief Technology Evangelist  
Inductive Automation*



**Dereck Saunders**

*Application Engineering Manager  
Inductive Automation*



# Ignition!

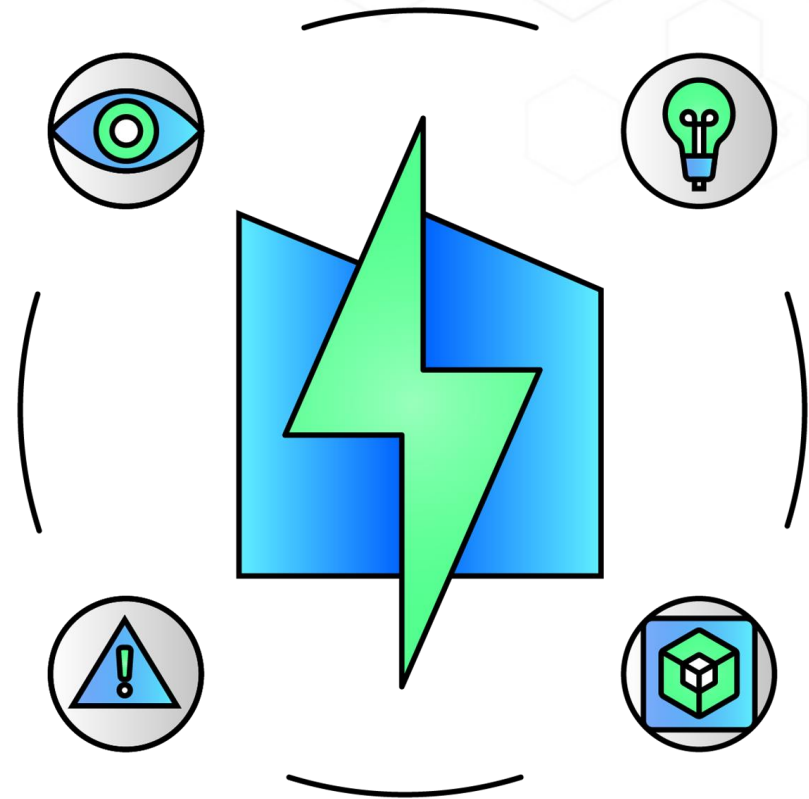
by inductive automation

**The Unlimited Platform for  
SCADA and So Much More**

- **Connect, Design, Deploy Without Limits:**
  - One central hub for everything on the plant floor
  - Create any kind of industrial application
  - Web-deploy clients to desktops, industrial displays & mobile devices
- **Unlimited licensing**
- **Industrial-strength security and stability**
- **Trusted by thousands of companies worldwide**

# Agenda

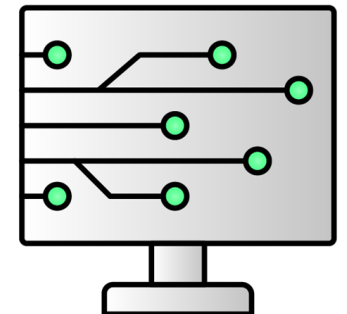
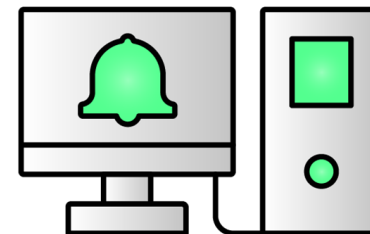
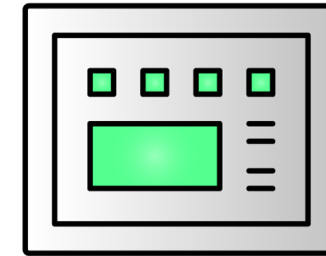
- **Obstacles to a Smart Substation**
- **IEC 61850**
- **Ignition as a Power Monitoring Solution**
- **Use Cases**
- **Audience Q&A**



# Obstacles to a Smart Substation

## Three Areas to Improve:

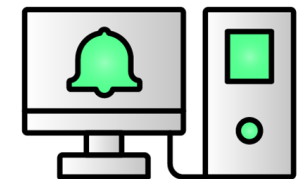
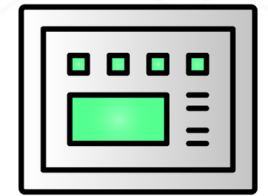
- Interoperability
- Hardware and Software
- Data Availability



# Obstacles to a Smart Substation

## Hardware and Software

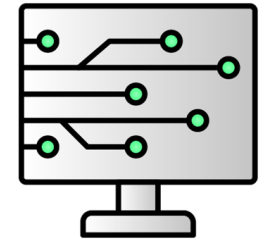
- Devices are not interoperable
  - Over time, most organizations acquire a variety of devices from different manufacturers
- Software is not compatible with all devices
- Many pre-built solutions are “black boxes”
- Results in islands of operation



# Obstacles to a Smart Substation

## Data Availability

- Non-standardized data
  - Different communication languages and protocols
- Data not accessible on all devices
- Unable to get data where it needs to go and to the people who need it
- Results in expensive, isolated data silos





## The IEC 61850 Standard

# IEC 61850

**to act as a buffer between  
the obstacles and the solutions.**



# The IEC 61850 Standard

## **The Basics of the IEC 61850 Standard:**

- Internationally accepted standard for communication protocols in power systems.
- A better way for IEC-compliant devices to read and write data.
- Builds a network of disparate, multi-manufacturer equipment.

# The IEC 61850 Standard

## **The Basics of the IEC 61850 Standard:**

- Upgrades data transmission speeds.
  - Replaces legacy systems like DNP3 and Modbus.
- Improves data transfer with:
  - Data modeling
  - Object structures

# The IEC 61850 Standard

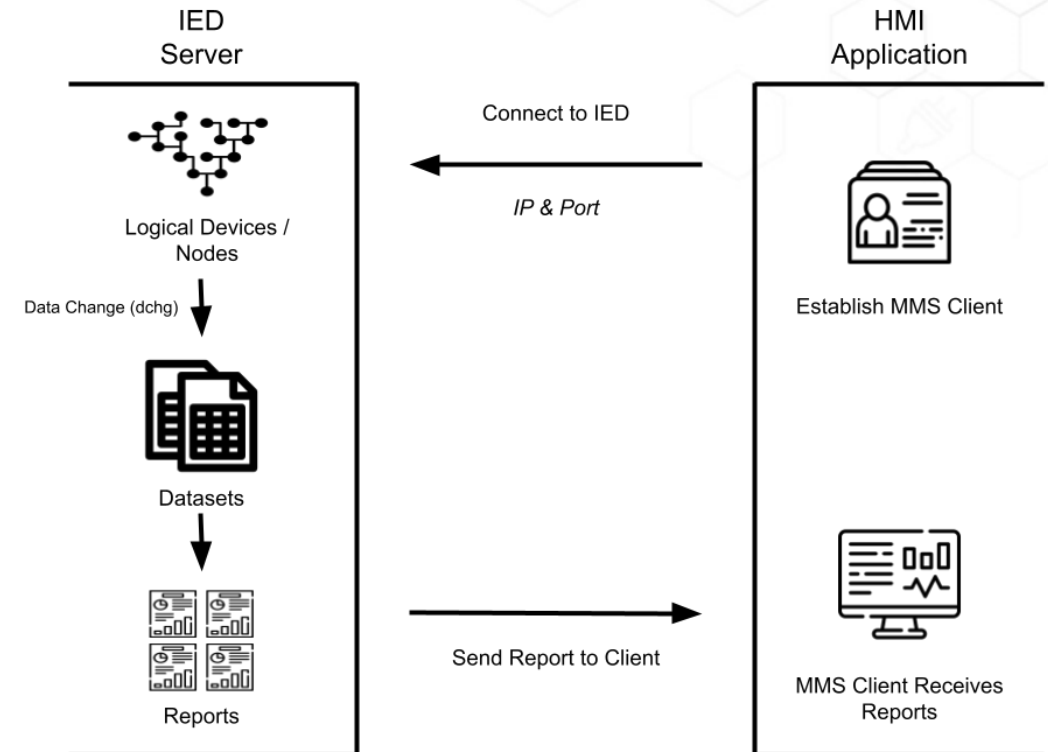
## **The Basics of the IEC 61850 Standard:**

- Related benefits:
  - Remote Management
  - Security & Safety
  - Costs
  - Modernization

# Ignition's IEC 61850 Driver

## Ignition IEC 61850 Driver Details:

- Can connect to any device that supports IEC 61850
- Acts as an MMS client for fast data and command transmission
- Leverages XML-based System Configuration Language (SCL) files to interact with equipment



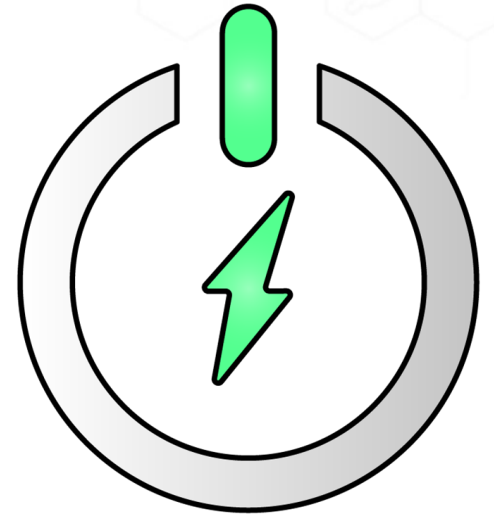


# Ignition + IEC 61850: A Powerful Pairing

## Monitor, Control & Optimize Your Power Supply

Ignition with IEC 61850 provides a clear picture of your operation or project's power. The benefits include:

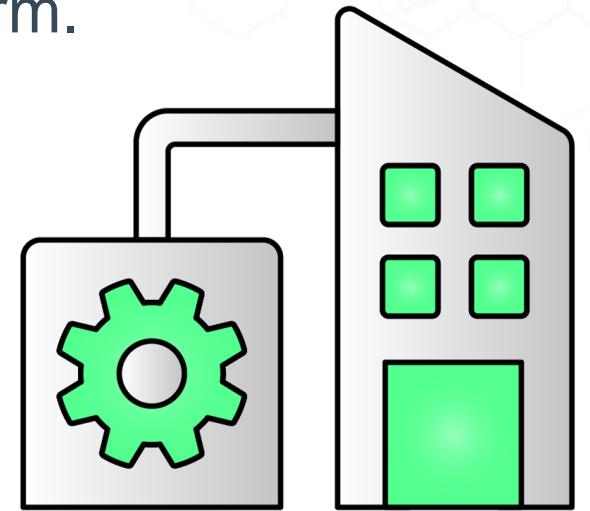
- Build a Network of Interoperable Devices
- Monitor Power Usage
- Control Power Distribution
- Expand Your Data
- Boost Productivity, Reduce Costs



# Benefit: Interoperability

## Build a Network of Interoperable Devices

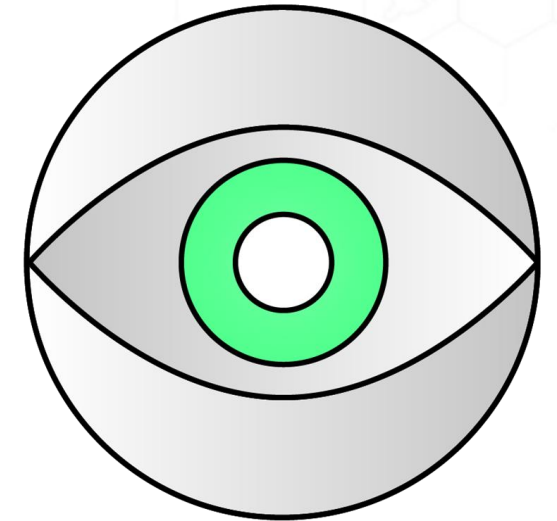
- Create a network of multi-manufacturer devices connected through a single vendor-neutral platform.
- Ignition's IEC 61850 driver can help you unlock proprietary restrictions on devices and tame complicated integrations.



# Benefit: Power Monitoring

## Monitor Power Usage

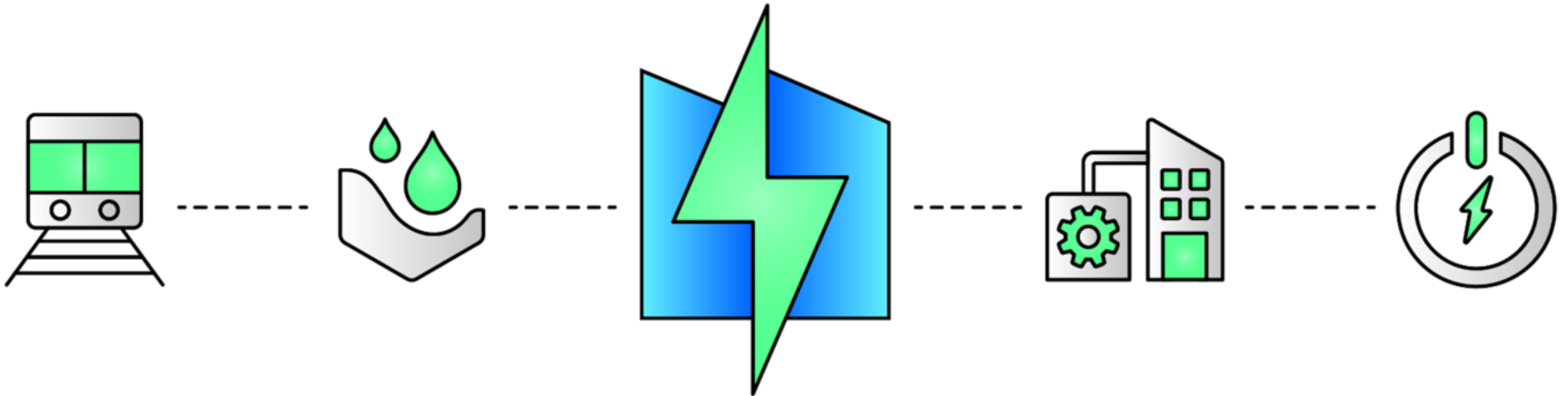
- Gain visibility over power systems with real-time data & custom dashboards.
- Configure alarms & notifications to get ahead of issues.
- View from anywhere, anytime — including remotely



# Benefit: Control & Manage Your Power

## Control Power Distribution

- Proactively manage power distribution.
- Make the most of your energy resources.
- Minimize power interruptions and reduce energy waste.

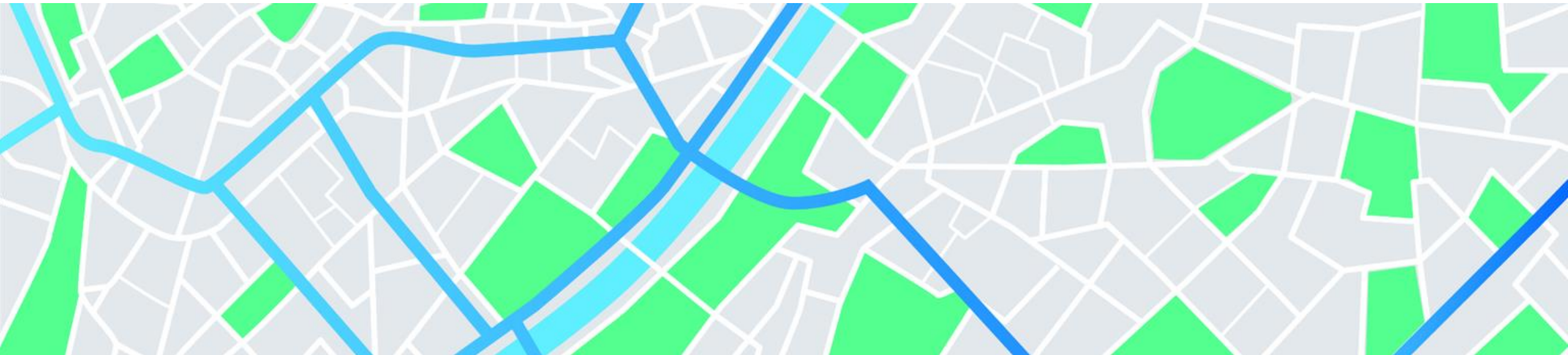




# Benefit: Data Modeling

## Expand Your Data

- Establish clear data standards and data object structures.
- Use Ignition's object-oriented design and user-defined data types for reusable parameterized templates in visualization projects
- Share data types across systems to standardize your processes.



# Benefit: Boost Efficiency

## **Boost Productivity, Reduce Cost**

- Interoperable devices lead to better data, which leads to more informed decisions & more efficient operations.
  - More accurate data from interconnected devices
  - Improve data security measures
  - Identify issues fast & address them immediately

# Ignition as a Power Monitoring Solution

## **Ignition Provides:**

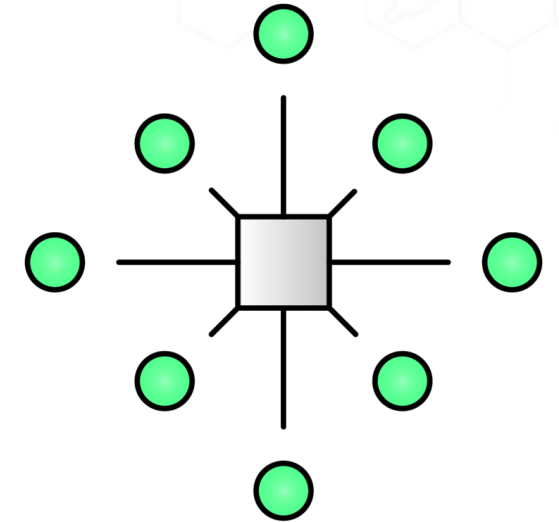
- Unlimited Licensing
- Universal Platform
- Customizable Development
- Rapid Deployment
- Streamlined Data Pipeline
- Industry-Leading Support
- Communication Protocol Drivers



# Benefit: Unlimited Licensing

## Focus on the Big Picture

- Ignition is server-based and allows you to add as many tags, clients, devices, and database connections as you need at no extra charge.
- Expand at your own speed

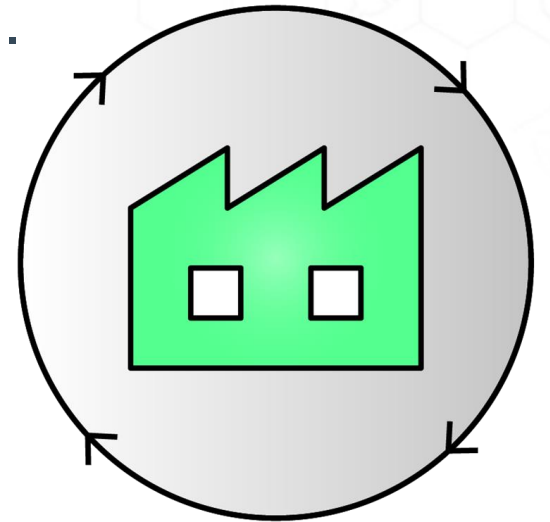




# Benefit: Universal Platform

## Control Equipment & Operations From One Place

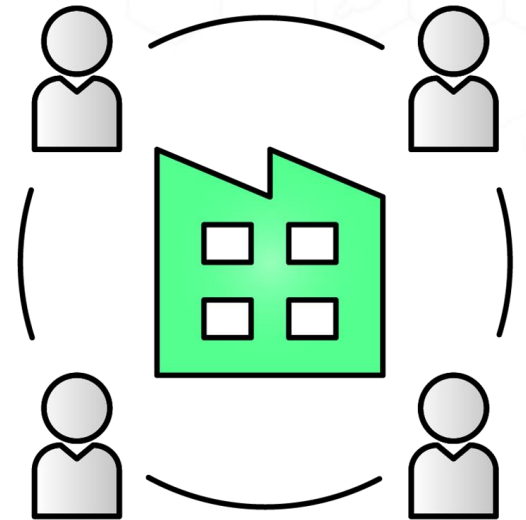
- Run it on any operating system, use it on any device or interface, and leverage it across any IT standard.
- Ignition is more than just a power monitoring solution, it encompasses:
  - HMI/SCADA
  - MES
  - IIoT
  - Historian
  - And more



# Benefit: Customizable Development

## Build Scalable Solutions With Flexible Architectures

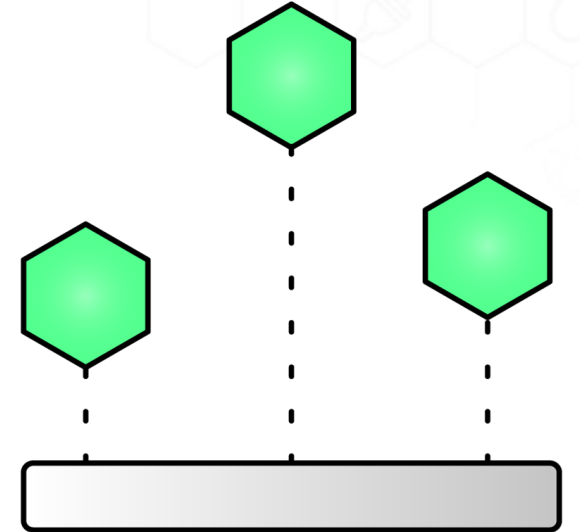
- Use the free, low-code Designer to build custom modules for your unique functions.
- Ignition gives you the ability to customize your application to an incredible degree
  - Architectures
  - Screen layout & styling
  - Functionality
  - Security
  - Alarms



# Benefit: Rapid Deployment

## Spin Up New Clients Whenever You Need to

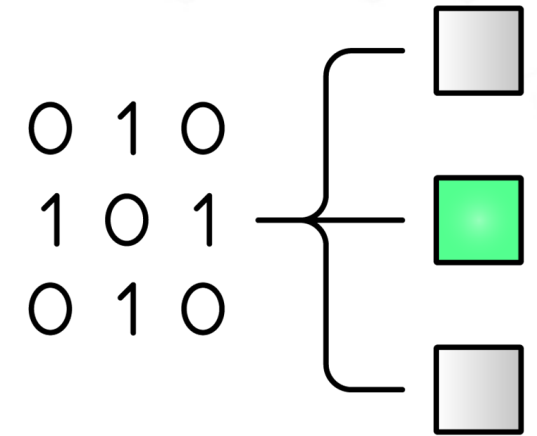
- It only takes 3 minutes to download Ignition
- Combined with unlimited licensing, Ignition lets you have clients when and where you need them
- Configure, manage, and launch clients instantly from anywhere on any device that has a web browser.



# Benefit: Streamlined Data Pipeline

## Elevate Data Collection

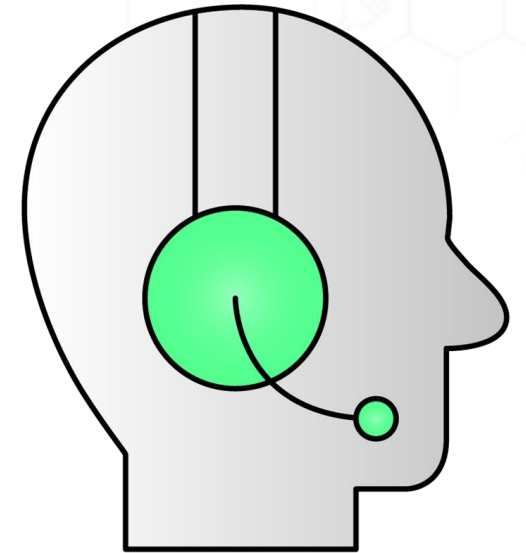
- Create a Single Source of Truth to seamlessly collect and spread data across an entire enterprise in real time.
- IEC 61850 makes data available, MQTT elevates it.
- MQTT's pub/sub data-transfer protocol is designed for constrained devices in low-bandwidth, high-latency networks.
- Define topic namespace to specify what data is collected.



# Benefit: Industry-Leading Support

## Get the Help You Need

- Tiered support system lets you choose your care
- Free support for integrators
- Learn directly from the people behind the software with in-person classes
- Inductive University has hundreds of tutorial videos





# Benefit: Communication Protocol Drivers

## Bringing it Back to IEC 61850

- Gain device interoperability and data modeling with drivers for IEC 61850, DNP3, Modbus, BACnet, and more.

# IEC 61850

# Demo



**Thomas Goetz**  
*Application Engineer II*



**Mitchell McPartland**  
*Application Engineer II*

**Vertech**  TM



# Use Case #1: SB Energy

## Problem

- SB Energy wanted to monitor and control a newly acquired portfolio of PV Solar Plants from their remote operations center in Redwood City, California.
- SB requested that the Ignition platform be used at both the Enterprise and Site levels.
- It was critical that the new software's performance would stand up to the sheer amount of data coming in from power plants in the field, while also providing a modern and beautiful UI that end users would appreciate.



# Use Case #1: SB Energy

## **Solution**

- Vertech created a single-platform, multi-site management tool that allows full access to view and optimize performance at each remote site.
- This solution integrated six solar sites with
  - Real-time data acquisition
  - Data validation & consolidation
  - Site monitoring
  - Performance analysis with clear industry relevance

# Use Case #1: SB Energy

## **Solution**

- SB Energy now has complete visibility of its fleet of sites, assets, and energy production performance.
- Now they can more easily maximize energy production and resolve maintenance issues with less time and resources.
- The dynamic, highly scalable new system also gives SB Energy a strong base for the future.





Location: Titan

OVERCAST CLOUDS



TEMPERATURE

23.1 C

593 W/sq m

POA SOLAR NOON

LocalTime CDT: 03:32 PM



50 Aug 07:47 AM 00 Aug 06:40 PM

WIND SPEED

2.57mph

52C11

Closed

52C12

Open

52C21

Open

52C22

Open

52F1

Closed

52F2

Closed

52F3

52F4

Grayscale



☒ External



1,708

Number of Inverters  
Online



1693.82

DC Capacity  
[MW]



2,380,702

MWh Delivered  
[MWh][YEARLY]



1.9

SO2 Avoided  
[Million lbs]



366,939

Cars Driven  
[Yearly]



203,364

Homes' Energy  
[Yearly]



1.67

NOx Avoided  
[Million lbs]



6

Total AE/EE  
[kWh]

JUNO B



JUNO A



TITAN



ATHOS I



# Use Case #1: SB Energy

## Project Scope

- Tags: 386,000
- Screens: 39 + 10 popups
- Clients: Remote operations center with 6 monitors in control room (30+ users)
- Alarms: 650
- Devices used: 6 Sites (1.7 GW), 6 Substations, 47 Breakers, 351 Blocks, 1720 Inverters, 611 Trackers, 27 MET Stations
- Architectures used: Hub & Spoke
- Databases used: Postgres SQL Server
- Historical data logged: 10K Updates per Second, 6.38B Updates per Month, 10K+ Calculations, 1.2 TB of Data

# Use Case #2: Ultimate Service Associates

## Problem

- Ultimate Services Associates was using a variety of third-party monitoring systems.
- None interfaced with the local offices, the national fleet office, or even the customers' staff.
- Needed was a USA name-brand solution that worked across all of their customer accounts.



# Use Case #2: Ultimate Service Associates

## **Solution**

- Brown Engineers leveraged Ignition's IIoT toolset to build a cloud-based monitoring system.
- State-of-the-art industry standards
- Security certificates to keep our customers secure
- Bi-directional communications for command and control
- Works on any generator, anywhere in the USA
- Perspective displays data on any web-based smartphone, tablet, or computer using
- Alerting systems to notify the appropriate people



# Use Case #2: Ultimate Service Associates

## Project Scope

- Tags: 6,000
- Screens: 10-20
- Clients: 50+
- Alarms: 200 alarm tags
- Architectures used: AWS cloud-based single gateway
- Databases used: 1 MariaDB
- Historical data logged: 150,000 rows/month, 400 historical tags



# Ignition + IEC 61850

## **Supercharge Your Solution with Ignition and IEC 61850**

- IEC 61850 delivers the interoperability needed to connect hardware, software, people, and data.
- Ignition future-proofs your system and removes the “black boxes” that make upgrades difficult and expensive.



## Ready to Try Ignition for Yourself?

Download the full version for free at:  
[inductiveautomation.com](https://www.inductiveautomation.com)



**[inductiveuniversity.com](https://inductiveuniversity.com)**

*Ignition User Manual also available at:  
[docs.inductiveautomation.com](https://docs.inductiveautomation.com)*



# THE DISCOVER GALLERY

**ICC 2023 SUBMISSIONS NOW OPEN!**

*Questions? Email us at: [ICC@inductiveautomation.com](mailto:ICC@inductiveautomation.com)*

**Submission Deadline: April 28, 2023**

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Contact International Distribution Manager Yegor Karnaukhov at: [ykarnaukhov@inductiveautomation.com](mailto:ykarnaukhov@inductiveautomation.com)

# Questions & Comments



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