



ACT

*ADVANCED CHARGING
TECHNOLOGIES*

Advanced Charging Technologies

Advanced Charging Technologies (ACT)

- Founded in 2008 in CA
- Initially offered private labeled battery chargers and monitors
- I Partnered with ACT in 2014
 - Established the engineering team in Orlando, FL
 - Software team in Jordan
 - Developed an IIoT product strategy
 - Designed and developed IIoT products and services
 - Developed the new EaaS business model

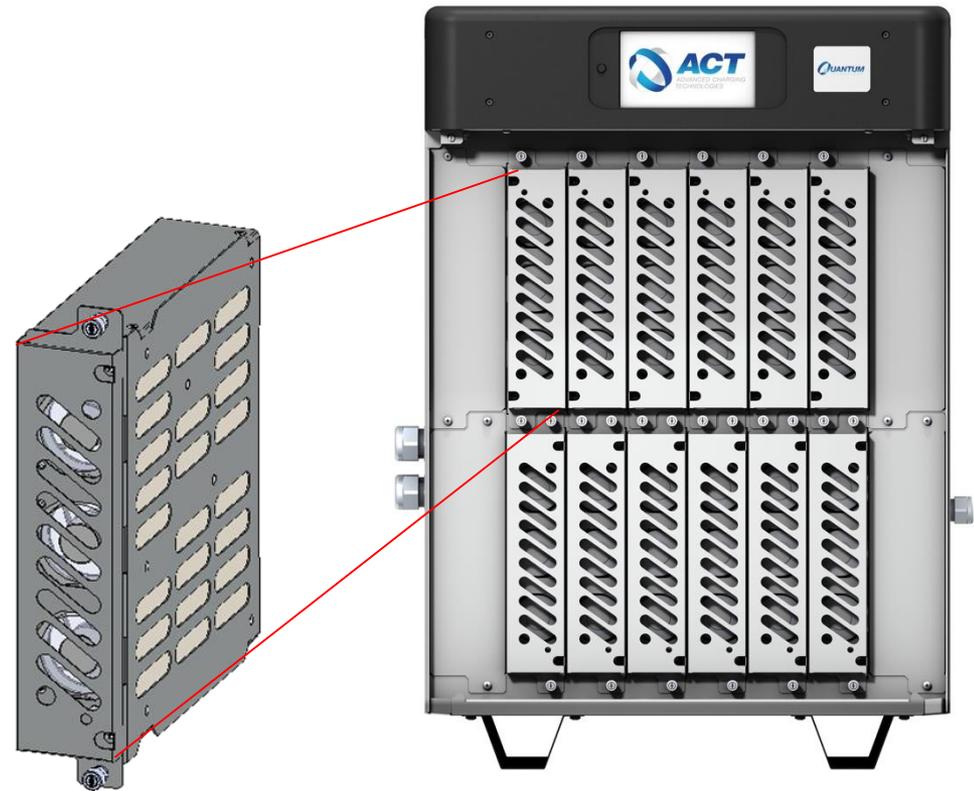
Product Innovation: Highly Intelligent Battery Chargers

- **Industrial IoT (IIoT) Battery Chargers**
 - Modular charger technology
 - Integrated two-way **wireless communications**
 - Machine-to-machine (**M2M**) communication
 - Remote command & control
 - Continuous data capture & upload
 - Real-time firmware updates



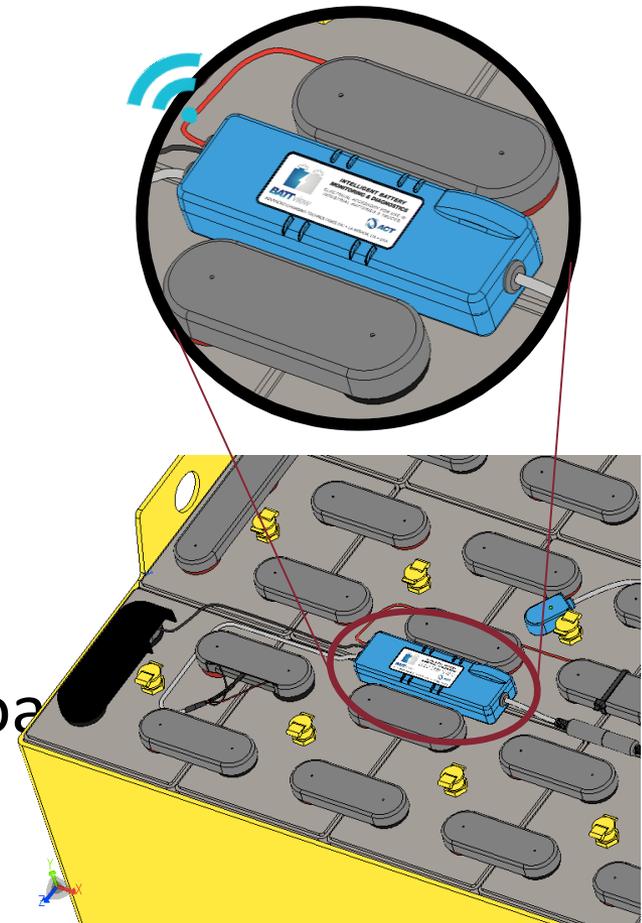
Modular Charger Technology

- Modular Technology
 - Uses a 2kW building block
 - Plug-N-Play operation
- Simplified service
- Leverages high volume & low cost manufacturing
- Sequencing control strategy that maximizes charging efficiency

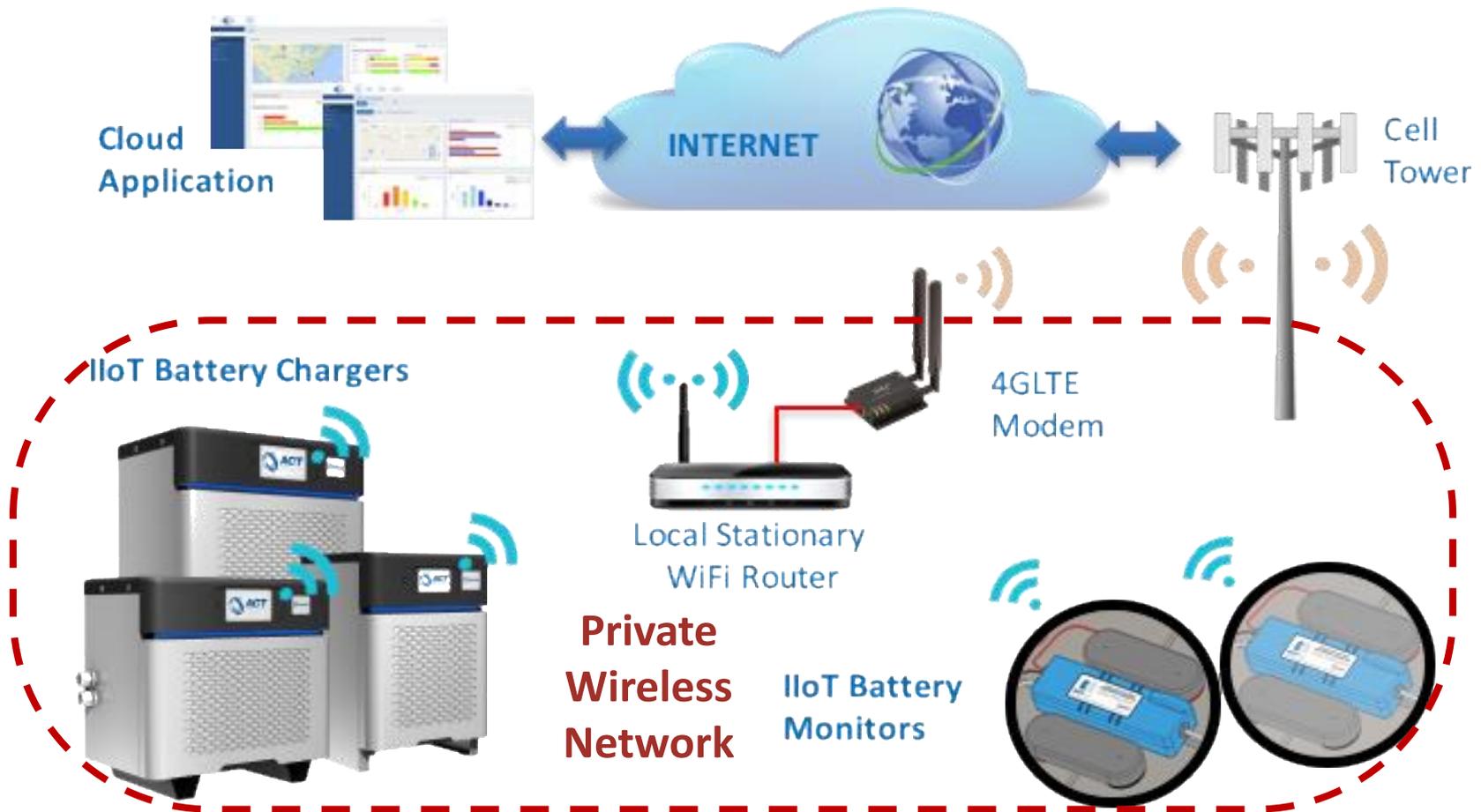


Product Innovation: Highly Intelligent Battery Monitors

- **Industrial IoT (IIoT) Battery Monitors**
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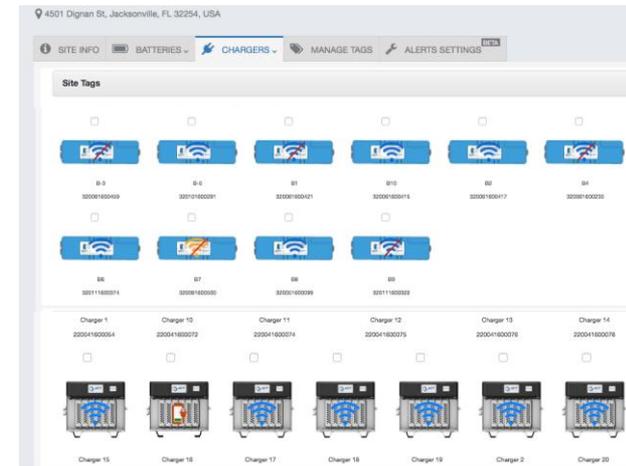


Wireless Remote Monitoring & Control / Cloud Application



Cloud Based Monitoring & Asset Management

- Web-browser based cloud application
- Centralized command & control
- Centralized data warehousing
- Centralized dashboard view & management
- Centralized reporting & analytics

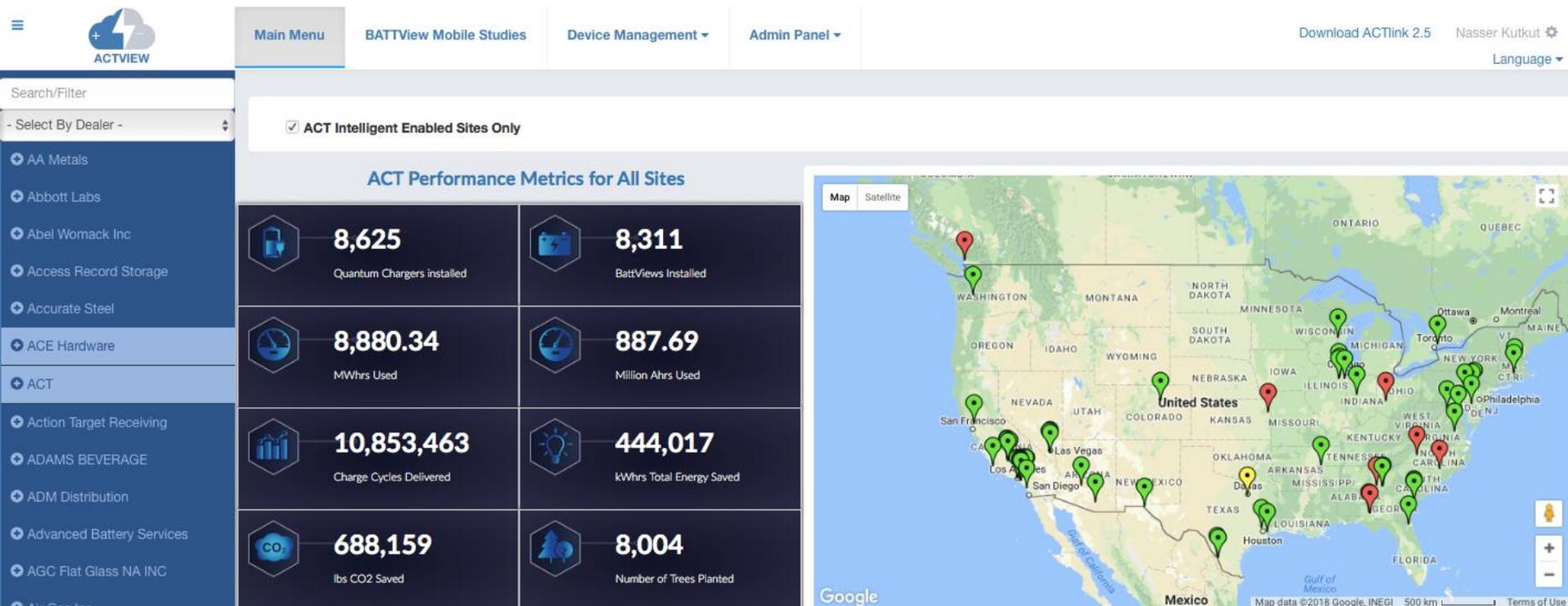


Network Operation Centers (NOCs)

- Fully managed asset monitoring
- Application engineering staffed NOCs
- Remote troubleshooting and service dispatch



ACTview Cloud Application



11,000+ chargers & 11,000+ monitors deployed to date



IloT Smart Sensors

Smart Sensors

- A smart sensor is a **device** that integrates:
 - A **transducer** → Converts physical to electrical measurement
 - **Analog electronics** → Amplify / filter electrical measurement
 - Analog to digital converters (**ADC**)
 - **Digital electronics**
 - **Microprocessor**
 - **On board memory**
 - **Wired / Wireless communication**

Smart Sensors: Examples

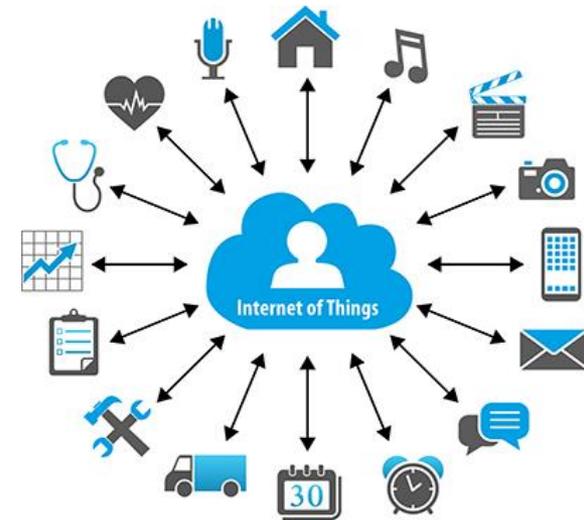


Smart Sensors: Capabilities

- Built-in self-test
- Self / Auto calibration
- Local data processing → Make decisions
- Local data storage
 - Historical & diagnostic data
- Two-way communication
 - Remote command and control

The Internet of Things (IoT)

- Making **'dumb'** objects **'smart'**
 - **Connecting** them to the **internet**
 - Improving their **functionality**
- **Software & Big Data** analytics are used to analyze data and generate **actionable insights**
- Tens of billions of devices are expected to connect to the internet
 - Ex: cars, appliances, light bulbs, ...
- **Goal:** Improve efficiencies, serve customers better



Industrial IoT Smart Sensors

- **Embedding** smart sensors into **products**
 - Making products **smarter**
 - Improving product **functionality** & **effectiveness**
- **Machine-to-Machine (M2M)** communications



Why IIoT Smart Sensors?

- **Improved products performance** (accuracy)
- **Self-diagnostics**
 - Reduces maintenance costs
 - Increases overall equipment uptime
- Better understanding of **customers' needs**
 - Understand how their products **are used**
- **Solve customers' problems**
- Explore **new value propositions**
 - Ex: Providing solutions enabled by data and insights

Questions

Nasser Kutkut, PhD, DBA

CTO

Advanced Charging Technologies Inc.

nkutkut@act-chargers.com

(407) 982-3452