



EISS™ — Energy Interop™ Server & System, Release 1.0

EISS™ is a unique business solution integrating a Software as a Service (“SaaS”) cloud-based computing platform with facility-based end point devices that interoperate with a variety of building management and energy control systems. EISS™ is open standards based and uses the new OASIS Energy Interop™ (EI) standard. This standard was created in alignment with federal Smart Grid efforts to provide a single, open standard for energy related communications.

Key Features

- Open standard encourages rapid and widespread adoption
- Web services allow rapid customer integration
- Machine to machine interactions provide rapid and dependable response
- Flexible, state of the art security model, based on our DoD experience
- User interface may be custom branded

Unique Business Value

- “Physical Hedge” technology mitigates risk, increases margins, and permits implementation of provider demand response (DR) programs based on energy price or as a means of reducing risks associated with peak pricing
- Unique notification feature allows energy providers to know when an endpoint is in price responsive or economic DR state
- First in industry variable sampling rate meter system – wherein the sampling rate

varies depending on DR event status

What is EISS™?

IPKeys’ EISS™ is a business solution that allows energy providers to exchange market based signals with their customers. This system is based on a new open standard – EI – that was developed as part of our national Smart Grid effort to promote interoperability between energy providers and consumers. This standard specifies a common interface and method of exchange so that energy providers and

consumers can interoperate. EISS provides an alternative to current vendor proprietary methods.

EISS™ consists of a cloud based server and a client end point. This system typically uses the internet to communicate, but can run over any IP based network.

What does EISS™ do?

EISS™ uniquely integrates Software as a Service (“SaaS”) cloud-based computing platform with facility-based integration that interoperates with a variety of building

The screenshot shows the 'EISS Web Administration' interface. At the top right, it says 'Logged in to System: Administrator' and 'Logout'. The main navigation bar includes 'Accounts', 'DR Programs', 'DR Resources', 'DR Events', 'Pricing', and 'Service Provider'. The 'DR Events' tab is active. On the left, there is a sidebar with 'Create New Event', 'Sent Events', 'Received Events', and 'View Event Log'. The main content area is titled 'Select Event Criteria' and contains several input fields: 'DR Program', 'City', 'State', 'ZIP Code', 'Pricing Provider', 'Zone', 'Grid Location', 'Level', 'Start Date', 'Start Time', 'End Date', and 'End Time'. There are also 'Search', 'Reset Form', and 'Send Event' buttons. Below the form is a 'Matching Assets' table with columns for 'Account', 'Resource', 'Asset', and 'Load'. The table is currently empty, with a message 'Select event criteria and click Search'.

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management and energy control system protocols, including BACnet, MODBUS®, etc. EISS™ also conveys pricing and a range of program information signals from Independent System Operators in an EI/OpenADR 2.0 format, further enabling interoperability.

EISS™ allows an energy service provider (ESP) to automate and scale secure real time communications with their customers that include distribution of price signals, demand response events and provider information and programs; reception of DR event confirmation and verification signals; and near real time monitoring of load.

How does EISS™ work?

The system provides three communications methods:

- 1) A web based portal for the provider to configure their programs and customers. The provider can provide real time price feeds, send demand response events, receive confirmations and monitor meter data to ensure compliance.
- 2) A web based user portal. This portal allows a consumer to schedule their availability, select programs, monitor pricing and review consumption data.
- 3) Machine to machine web services enables a direct interaction between the energy provider and end point equipment. This capability dramatically improves the speed and reliability of the end point

equipment's response to demand response and price based behaviors.

Machine to machine

interactions are the core of EISS™. Many systems exist to communicate with your customers – like telephone and email. EISS™ uses web services to communicate information directly to your customer's equipment. Once integrated, these web services eliminate the delay and uncertainty of "human in the loop"-based systems.

What is an EISSBox?

EISS™ uses two way web services to create a loosely coupled system to enable rapid and scalable customer integration. Web services are designed to be directly integrated into the end point equipment. Where a customer's equipment is not able to receive these web services IPKeys provides an **EISSBox**. This device enables legacy equipment to connect to EISS™ web services. It contains business rules and control logic to translate the web service input into control signals that are compatible with facility equipment. This functionality allows the machine to machine response to be integrated into current premise equipment without costly retrofits or replacement.

Is EISS™ secure?

EISS™ implements a flexible security model that includes such technologies as SSL and PKI. IPKeys leverages the expertise of its DoD Information Assurance practice to make EISS™ secure. Our cyber security

specialists are experienced in supporting the rapid development and implementation of security standards. Our SME's experience stems in part from providing lead engineering services to the U. S. Department of Defense for rolling out various framework technologies identified in the Army Digitization Master Plan, Battlefield Information Transmission System and the Defense Message System (DMS).

Typical uses of EISS™?

To mitigate risk in the wholesale energy market, energy providers use bulk power purchase agreements, essentially financial hedge agreements. These energy and financial hedges are expensive.

EISS™ is a system that implements next generation demand response technology for energy providers. It enables highly granular conveyance of current market prices in conjunction with machine to machine two way communications to self regulate demand and maintain grid stability. EISS™ provides a "physical hedge" that automatically reduces energy consumption according to preset policy during periods of high prices.

The IPKeys physical hedge technology complements existing paper financial hedge agreements and enables energy providers to signal predictable behavior changes based on real time energy prices to their client facilities. This is done using machine to machine two-

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way communications and program logic to transmit predetermined changes in electricity consumption in response to price signal information to the building energy management and lighting control systems of energy provider clients.

The IPKeys physical hedge provides a layer of assurance to wholesale market sellers and buyers by ensuring execution of a pre-agreed upon load curtailment during high price periods. By reducing demand during periods of high prices, overall energy expenditures are kept under control. This new capability can reduce the amount of financial hedge required. Load curtailment is confirmed and verified in near real-time.

EISS™ also provides the ability to enable emergency override of predetermined load curtailment settings for grid

stability.

The bottom line savings obtained by realizing a portion of the spread between wholesale and retail tariff prices available to retail consumers from moving to wholesale markets are increased by the IPKeys physical hedge by reducing financial hedge requirements.

When DR program rules permit, EISS™ permits ESP customers to schedule their participation in DR programs. EISS™ also permits a customer to “opt out” of a DR event when the signal is received. This approach differs from direct load control in that the ESP customer decides how often they will participate. As customer business needs change, so too can their DR program participation. This capability dramatically increases adoption rate in customers concerned about participating in demand response events.

Since most schedules are set prior to DR events, the energy provider will know who is available for a specific demand response event and can monitor compliance in near real-time.

How do I get started?

Getting started is easy! An IPKeys engineer will work with you to tailor your system to your needs. First, a needs survey is performed to determine the overall functionality that best suits your requirements. EISS™ is a modular system, so if you decide to expand your capabilities later, it's easy. Next, we design the look and feel of your web portal. They are custom branded to match your company's image. Since EISS™ is web based, it expands easily as your customer base grows.

For more information on EISS™ – Energy Interop Server & System, call +1-855-475-3970, or email energy@ipkeys.com.

About IPKeys

IPKeys Technologies, LLC is an emerging strategic partner in the federal, DoD, commercial and energy sectors delivering expertise in the definition, development, integration, and deployment of secure Internet Protocol (“IP”) technology, software, and communications systems.

