



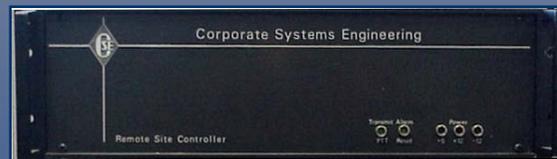
**CORPORATE
SYSTEMS
ENGINEERING**

www.corporatesystems.com

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CORPORATE SYSTEMS ENGINEERING



CSE Has 25 Years of Experience in Load Management



WHO USES CSE?

Some of Our Customers...



- We have received the largest order ever placed for load control switches and are administering its accelerated deployment
- We are providing technology assistance in energy management to other major utilities



THE CSE COLLABORATIVE PROCESS

We are a solutions provider first;
and an equipment supplier second

We believe in forming strategic relationships
with our clients

We truly believe that *one size does **NOT** fit all!*



FEDERAL ENCOURAGEMENT

EPACT 2005

“It is the policy of the United States that time-based pricing and other forms of demand response ... shall be encouraged, the deployment of such technology ... that enable electricity customers to participate in such pricing and demand response systems shall be facilitated, and unnecessary barriers ... shall be eliminated.”

U.S. DOE Report to Congress Recommends:

- Fostering price-based Demand Response
- Improving incentive-based Demand Response
- Strengthening Demand Response analysis and valuation
- Integrating Demand Response into resource planning
- Adopting enabling technologies (BPL, HomePlug, AMI, *etc.*)
- Enhancing *federal* Demand Response actions



ONE SIZE DOES NOT FIT ALL!

- Most use a *Solution* centric design approach
 - Make my thermostat do everything I need
 - Make the meter do everything I need
 - Use my existing communications method to do everything

- CSE uses a *Problem centric* design approach
 - Look at the scope of the problem
 - List the primary constraints
 - Evaluate available technologies against constraints
 - Provide a solution configuration to fit customer's needs



WHAT ARE SOME OF THE CONSTRAINTS?

- Large load shedding A/C, water heater, pool pump
- Speed of response
- Qualification as spinning reserve
- Reliability of system and communication
- Compatibility with AMI
- Under-voltage events
- Under-frequency detection
- Thermostats for better comfort
- Oversized air-conditioner
- Customer override
- Cost of installation and hardware
- Ease of installation
- Time of Use Rates
- Compatibility with existing communications structure
- Cold load pickup
- Open protocols (expandability and sourcing reliability)
- Compatibility with energy efficient homes of the future
- Usefulness to the consumer
- Audit of program effectiveness
- Service life of system
- Maintenance costs



THE CSE SOLUTION SET

The Energy Control Transceiver

The ECT forms the core component

- Multiple Message Protocols
 - ACP command language
 - Thermostat control languages
 - Pricing messages
 - Other required protocols
- Two Communications Paths
 - Selectable primary path
 - Selectable secondary path





PROGRAMMABLE FEATURES

The ECT allows the utility or consumer to program and view responses to:

- Demand Response events
- Pricing signals
- Thermostat responses
- Adding additional loads
- View load trends
- View event history





COMMUNICATIONS

Configurations include integrated AMI



or independent communications paths





AVAILABLE COMMUNICATIONS TECHNOLOGY

Primary Communications Path



VHF/UHF

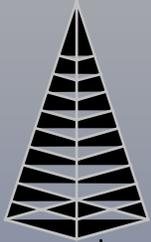
Secondary in-Home Communications Path





THE BASE SYSTEM PLUS OPTIONS

Core Demand Response System

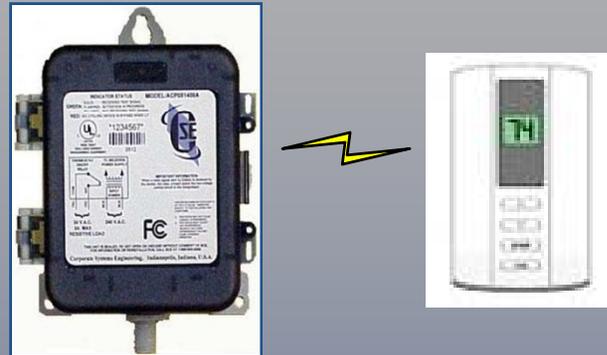


Up to 20 devices on
in-home bridge network





THE THERMOSTAT



If a communicating thermostat is installed, the ECT will automatically detect and use it

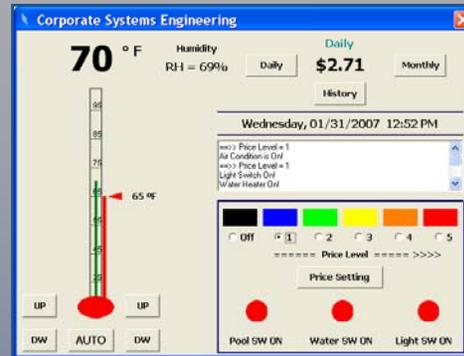
CSE chose not to make the thermostat the center of our system for many reasons:

- *The thermostat should remain a commodity*
- Several key constraints cannot be implemented from the thermostat



HOW TO MODIFY ECT SWITCH SETTINGS

- In-home display
- Simple display
- Installer setup
- Internet portal





EVALUATION OF COMMUNICATIONS OPTIONS

Pilot versions that allow configuration options to be explored easily





HIGH VOLUME DEPLOYMENT

Custom layouts can be done once the system is defined, allowing for the lowest total cost solution





MANUFACTURING CAPABILITES

Our fully automated manufacturing facility has the capacity to meet any delivery schedule





THE BENEFITS OF WORKING WITH CSE

- CSE can help you choose a system that fits your needs
- Our solutions are expandable and configurable by design
- We can customize any system when it's necessary to fit your goals
- The advantages of working with a custom engineering and manufacturing firm



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For Control When It Counts



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