



**USC Viterbi**  
School of Engineering  
*The Energy Institute*

# CiSoft Solutions

Established for Technology Commercialization

PTG

3710 McClintock Ave. RTH 311, Los Angeles, CA 90089-2902 213.740.1076

## Pervasive Thermo-electric Generator

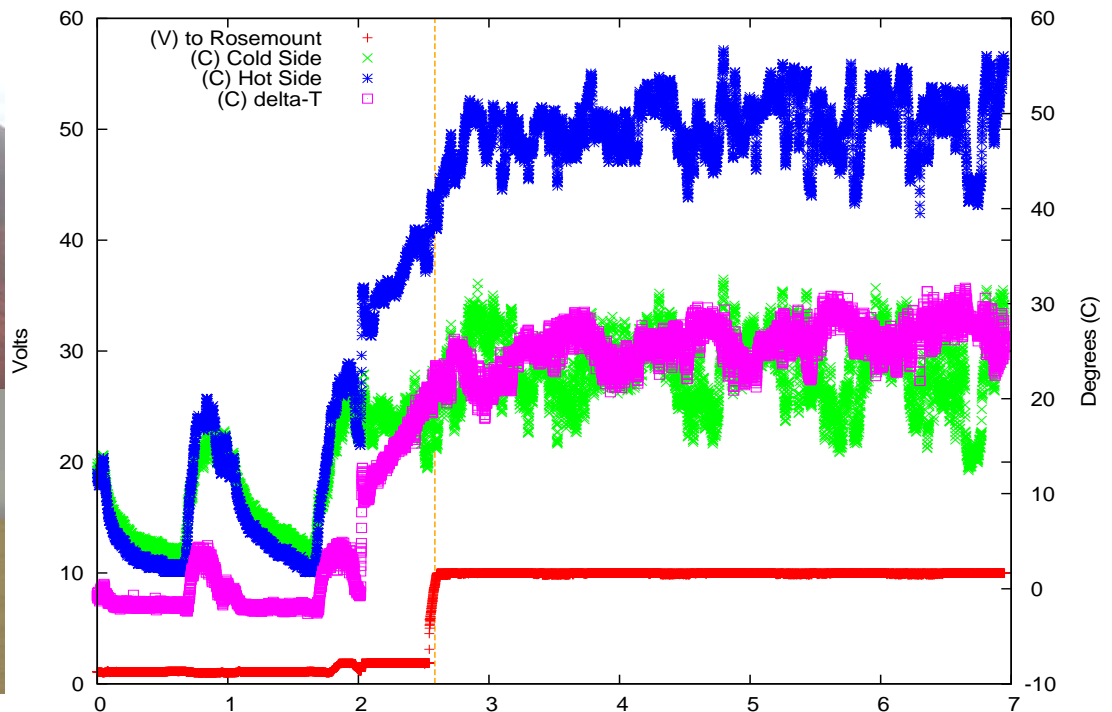
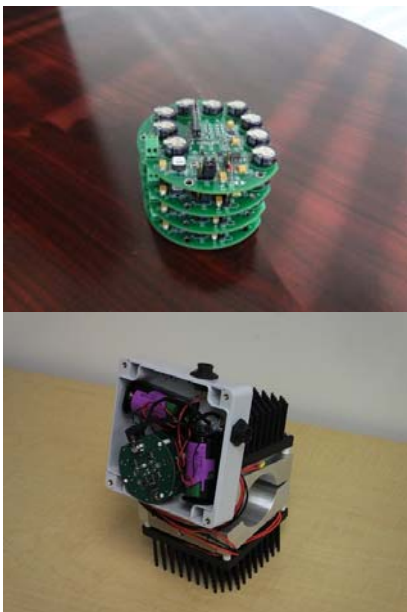
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***PTG can power wireless units in place of batteries with little to no maintenance costs***

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PTG is a novel energy harvesting system using a low temperature differential from heat sources to expand the use of wireless sensing devices. As a rule, it is very difficult to reap sufficient energy from low-delta-T environments. PTG is a proven solution revolutionized with both our custom stack design and our proprietary electrical conditioning circuit. In addition, power conditioning electronics include storage capacitors which will not only allow PTG to power sensors, but also convert the original battery into backup power storage during the transient low delta-T conditions.

PTG enables engineers, operators and scientists the freedom to instrument anywhere in the field, collecting the data necessary to operate as efficiently as possible, while doing away with battery costs and replacement procedures, increasing profits as a result.



## About CiSoft

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*CiSoft's role has been to generate bursts of innovative ideas related to digital oilfields*

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CiSoft is a USC-Chevron Center of Excellence for Research and Academic Training on Interactive Smart Oilfield Technologies. Established in December 2003, the Center includes participating research scientists from various departments in the Viterbi School of Engineering and from Chevron. Two important entities associated with the Viterbi School of Engineering, IMSC (Integrated Media Systems Center) and ISI (Information Sciences Institute) are closely associated with CiSoft. Expertise of participating USC faculty includes Petroleum and Chemical Engineering, Computer Science, Electrical Engineering and Industrial and Systems Engineering. Research areas include:

- Integrated Asset Management
- Well Productivity Improvement
- Robotics and Artificial Intelligence
- Embedded and Networked Systems
- Failure Prediction in Artificial Lift Systems
- Reservoir Management
- Data Management Tools
- Immersive Visualization
- Environmental Health & Safety

## About USC

University of Southern California is at the forefront of research in information technology and a full spectrum of engineering disciplines. The Viterbi School consistently ranks in the top ten in the U.S. News and World Report rankings. Our highly interdisciplinary research environment has enabled faculty to respond to emerging needs for research in such diverse areas as conventional and renewable energy, imaging, robotics, software engineering, sensor networks, vision sciences, automated construction and photonics. The Viterbi School actively encourages technology transfer and commercialization through industrial partnerships. The university has several high performance computing resources with significant computational capabilities for a variety of computation-intensive projects including subsurface modeling and simulation. Our network spans all over the world and is reputed to be one of the largest, most influential, and loyal.