Siemens Makes Electricity Meters Pulse With 3D

SITUATION

Siemens Measurements Limited operates in a market that is shrinking due to uncertainties related to the planned liberalization of the UK electricity industry. As a result, UK regional electricity companies, Siemens' primary customers, became reluctant to install new equipment in their customers' homes since any products they might invest in could quickly become obsolete. Siemens decided to develop a radically new product that would succeed in this uncertain market by providing an upgrade path for future requirements at very low cost.

OBJECTIVES

✔ Make a new adaptive electricity meter that would offer expanded functionality by adding modules such as smart card, radio telemetry, and other communications systems.

✔ Keep manufacturing costs down by holding the design tolerances so accurately that a minimal number of screws would be required to fit the unit together.

✔ Make it a quarter the size of existing meters so that even after the addition of modules, the new product could still fit in tight spaces.

✔ Include the installation switch, traditionally a separate item, in the meter itself to save on equipment and additional installation costs.

"When you compare our meter to what the competition offers, it's pretty obvious that it's in a different league. The design is quite striking. It has proved a winner with our customers with over 100,000 being sold in its first year of production. I-DEAS™ not only helped us with overall appearance but also the fine detail required to ensure the correct fit and operation of mating parts."

- John Cowburn
Project Leader
Siemens Measurements Limited

I-deas™
Get There Faster™

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PROCESS VISION

✔ Be able to visualize design concepts on-screen and produce prototypes early in the cycle for review by team members and customers.

✔ Use 3D for optimization of space and fit in new products.

✔ Make revisions quickly and deliver the final product rapidly.

ACTIONS

✔ Using I-DEAS Master Series™, Siemens engineers quickly developed a 3D concept model and then invited prospective customers to see the new design displayed and animated on-screen using I-DEAS software's sophisticated visualization capabilities.

✔ Revisions were made to both the internal components and external appearance, and rapid prototypes were generated directly from 3D data.

✔ Using I-DEAS' analysis capabilities, Siemens engineers verified fit and function, and optimized the clips and the switch mechanisms.

✔ Using the interface between I-DEAS and Vutrax, the circuit board layout software used by Siemens, the electronics subassembly in the system was brought into the 3D model and the engineers were able to check that the circuit board did not interfere with other parts.

RESULTS

✔ Siemens succeeded in meeting the objective of producing a very small meter, less than a quarter of the size of a traditional meter.

✔ The new meter was brought to market in just 12 months instead of two years, a time saving of 50%.

✔ Since prototypes could be made early and potential problems identified before tooling took place, the tooling budget was cut by 10%, a saving of £15,000 (approximately $25,000). Time scales were also reduced, and the close collaboration with toolmakers helped ensure that even the highly sophisticated tooling required was right the first time.

✔ The integrated design and analysis process resulted in a design that was so accurate, no screws were needed to hold the assembly together. However, Siemens was obliged to include one screw to enable the meter to be certified.

✔ Since potential customers were active in the development process, they were ready to place orders as soon as the meter was completed.

PLANS

Siemens has doubled its number of I-DEAS seats. It has also launched a European version of its new electricity meter, and has developed several new modules, many at the suggestion of its customers.

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