CASE STUDY SENTIENT ENERGY

Rugged High-Performance Multiband Antenna Solves Complex Requirements

Image courtesy Sentient Energy, Inc.

INTELLIGENT SENSORS PROVIDE UTILITIES CRITICAL INFORMATION

When the lights go out, electric utilities need to identify the location of an outage quickly. During emergencies, it is critical to provide response crews with accurate fault information so problems can be fixed and power restored.

Sentient Energy offers a robust Grid Analytic System that monitors the distribution grid, taking the guesswork out of identifying faults, events and disruptions. When a fault or potential fault is detected, overhead and underground intelligent line sensors send data wirelessly to the utility control center over cellular carrier or mesh networks, sharing data and improving response time.

Sentient ENERGY

PCTEL

OVERHEAD SENSORS PROVIDE CRITICAL DATA

"Our overhead sensors, the MM3™ and the ZM1™, have a high-performance built-in PCTEL antenna that enables the connectivity required to communicate with the wireless carrier's network and send all critical data to the cloud to run analytics reports," explained Samir Badia, Director of Product Management for Sentient Energy.

NEW UNDERGROUND SENSOR CHALLENGES

"The portfolio of overhead sensors works well for utility customers, but we were missing an underground sensor for switch cabinets and vaults," shared Badia. He went on to explain that creating the UM3+™ underground sensor was a lot more complex, "The problem was at ground level or below grade level because it is challenging to get an RF signal and the antenna has to be outside of the equipment. We also wanted the GPS to be co-located, so the custom device had to have multiple things in one antenna enclosure."

In addition to RF challenges, Sentient needed a very rugged device capable of withstanding environmental elements and physical abuse. One of Badia's design requirements was to have a high impact resistance antenna that could operate over cellular carrier and mesh networks.

OPTIMAL DESIGN FOR UNDERGROUND

Sentient knew an off-the-shelf antenna would not work. They needed a custom solution. "We had already engaged with PCTEL on our overhead sensors and had a good experience," said Badia. "It was logical for us to continue to work with PCTEL to introduce the underground design."

"There are several restrictions on our devices because of the environment," shared Badia. "They will be out in the field for 20-plus years in harsh, high-current and high-voltage environments. And, there are some space and electronic related restrictions. So, the ability of PCTEL engineers to come up with an optimal design, keeping all those constraints in mind, was a good thing for us."

"Our collaboration with Sentient Energy allowed us to demonstrate our capability to solve complex RF wireless challenges," explained Jeorge Olague, PCTEL's Senior Director of Product Management. "With a high-performance, purpose-built antenna solution tailored to Sentient's specific application, PCTEL enabled the reliable connectivity required for underground restrictions."

"There are several constraints and limitations with these types of applications. PCTEL is always up to the challenge."

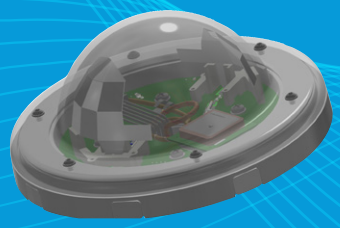
– Samir Badia, Sentient Energy Director of Product Management

WORKING TOGETHER TO DEVELOP THE RIGHT PRODUCT

Talking about the new UM3+ underground line sensor, Badia said: "This is a recently launched product. It's been doing really well. There were some design modifications needed based on the Beta deployments, and PCTEL incorporated those design changes."

"We have a good working relationship. The feedback mechanism is good. A lot of PCTEL engineers are interfacing directly with Sentient engineers. They shared their experiences in underground antennas and guided us to come up with a good design for our solution."

DESIGNED TO OPTIMIZE WIRELESS PERFORMANCE



PCTEL teams work with organizations to engineer high-performing custom antenna designs to solve specific requirements.

- Radio and motherboard design and integration
- Antenna element and mechanical design
- Certification assistance and manufacturing

Learn about PCTEL Antenna Design Services at:

> pctel.com/antenna-system-engineering-capabilities

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