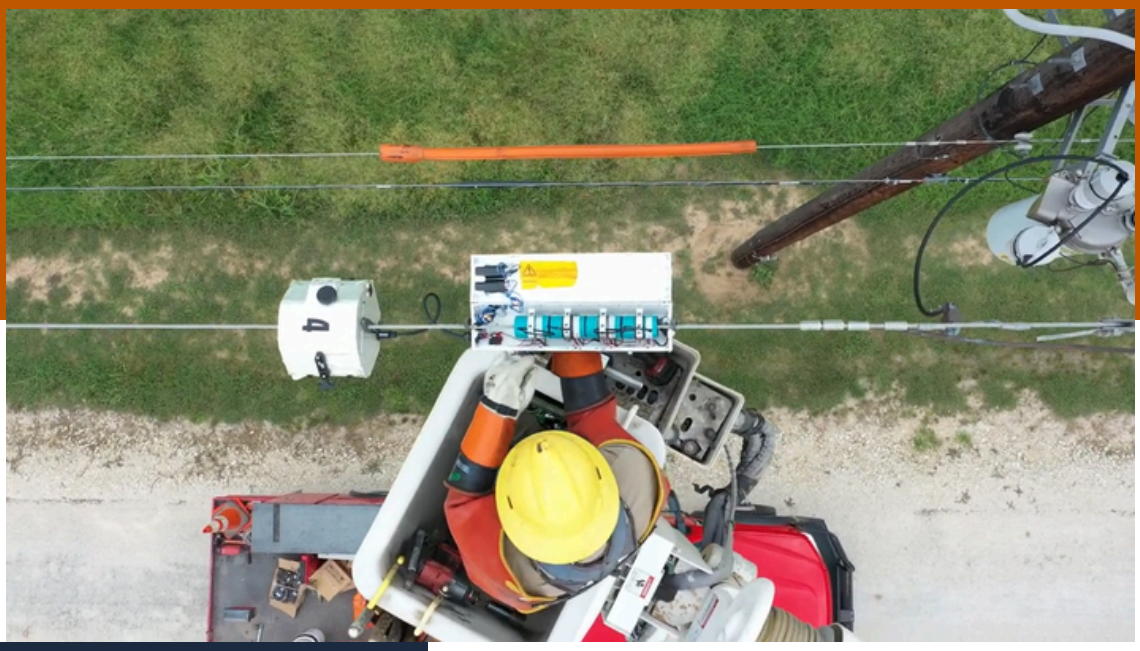
GRID SOLUTIONS: INTELLIGENT POWER LINE SENSOR



Enhanced Situational Awareness

- High-Impedance Fault Detection
- Incipient Fault Detection
- Real-Time Data
- AI Driven & Cyber-Secure
- Grid Monitoring & Protection
- State Estimation Solutions
- Reliable Power Delivery
- Resiliency & Sustainability

Keeping the lights on.

The Center for Electromechanics (CEM) has developed a first-of-its-kind self-powered smart sensor capable of "living" across a distribution utility grid to support fault detection and mitigation.

The "Advanced Intelligent Sensor for Future Distribution Systems with High Penetration Distributed Energy Resources (DERs)," research project was directed at improving the electrical distribution system through novel sensors and robust edge computing.

The sensor has unique and impressive capabilities:

- Compared to traditional monitoring equipment, the sensor can detect potential threats ten-fold.
- The clamp-on design and inductively coupled power module permits flexibility to use where needed.
- Installation doesn't require service interruption or auxiliary power.
- Wide bandwidth up to 1-MHz to detect various event types.

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INTELLIGENT POWER LINE SENSOR

Enhancing Resilience in Electrical Distribution Systems

DEMONSTRATED APPLICATIONS

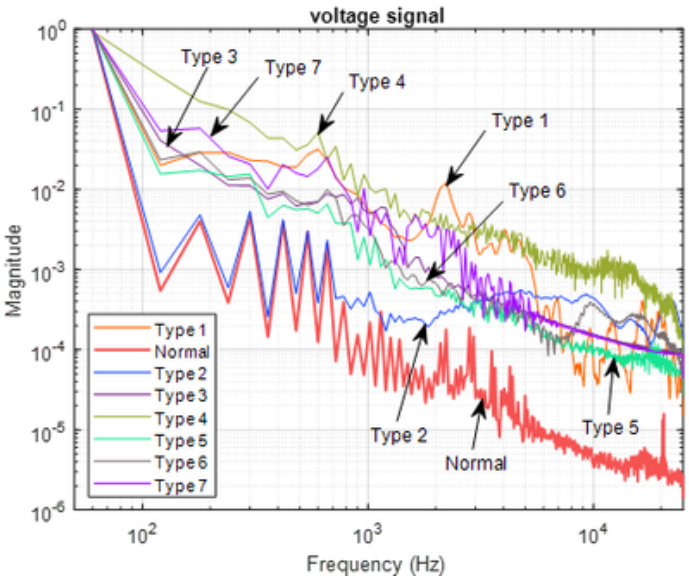
- Fault-Type Identification (see plot below)
- Incipient and High-Impedance Faults
- Traveling Wave-Based Fault Location

REAL-TIME EVENT DETECTION

- Intermittent Brush/Tree Interactions
- Downed Conductor
- Cracked Insulators

DATA COLLECTION TOOLS

- Phaser Measurement Unit (PMU): IEEE C37.118 Compliant
- Point-on-Wave (PoW) in Comtrade Format



TESTING CAPABILITES

- Laboratory capability generates years' worth of operational data in weeks.
  - MW-Capable Microgrid
  - Controlled Fault Generation
  - Hardware-in-the-Loop (HIL)
  - RTDS Network Simulation
  - Medium Voltage Alternating Current (MVAC) Tree Branch Test Site
- Successful lab demonstrations and field deployments with local electric utility cooperatives.

- Normal
- Type 1: Three-phase voltage step change
- Type 2: Spiking
- Type 3: Cycle overcurrent
- Type 4: Sub-cycle transient failure
- Type 5: Tree touch
- Type 6: Load pick-up
- Type 7: Animal Contact

SCAN HERE FOR MORE RESULTS & DATA:

STRATEGIC PARTNERSHIPS

- Wood County Electrical Cooperative
- Guadalupe Valley Electric Cooperative
- Verivolt
- National Instruments
- Eaton
- Capstan Technologies
- Argonne National Laboratory
- Sandia National Laboratory
- USACE ERDC CERL

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WHAT STARTS HERE CHANGES THE WORLD