



Evaluator Guide for Line Sensors

Line sensors for overhead and underground electric distribution circuits are a proven technology. Powerful sensing and long-range communications enable increased visibility of distribution system data for grid operators. But solutions vary, so when evaluating line sensing solutions be sure to consider the following criteria.

Evaluation Criteria	Questions to Consider
1. Fault Detection Technology	Are current thresholds sufficient for fault detection, or are additional remotely configurable algorithms such as di/dt or % change important?
2. Accuracy	What accuracy is needed for both load data and fault magnitude? Fault magnitude may be used for "Distance to Fault" calculations.
3. Fault Magnitude Range	Sensors vary greatly on fault magnitude range. What is your upper limit required for fault magnitude range?
4. GPS Location and Timing	GPS is an important capability for verifying location and time stamping for sequence of events. Are these requirements?
5. Sampling Rate	Sampling rates for waveforms vary from 20/cycle to 256/cycle. What resolution of waveform data is adequate for your fault analysis?
6. Disturbance Capture	Can sensors report disturbances in addition to faults with outages? Disturbances can identify precursors to faults.
7. Load Unbalance Analysis	Most sensor systems report load data. Can the system also identify and quantify phase unbalance on 3-phase feeders?
8. LED Visibility	The visibility of LEDs indicating faults can vary greatly. What LED visibility is required for your distances and lighting conditions?
9. Wireless Communications	Which wireless technologies are supported (cellular, mesh)? Are separate gateways and RTUs needed in addition to sensors?
10. Power Requirements	Is the system fully line-powered (at what amperage?), or does it require AC power and use of batteries?
11. Conductor and Equipment Types	Overhead: what is maximum conductor size and voltage? Underground: can you install in livefront and deadfront cabinets?
12. Environmental Ruggedness	Has the system been qualified to operate in harsh environments in terms of temperature, humidity, salt spray, ingress etc.?
13. Field Proven Solution	Has the solution been deployed successfully in the field? What size (number of sensors) are the largest deployments?
14. Product Roadmap	Does the solution provider have a long-term product development plan including updates and enhancements?

To learn more about best practices and use cases for line sensing visit www.sentientenergy.com or email info@sentient-energy.com.

Sentient Energy®, a Koch Engineered Solutions company, is the premier provider of intelligent sensing, data analytics, optimization, and control technologies for the distribution grid. For more information visit www.sentientenergy.com.

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