



# Fault Indicators and Sensors

Find Faults Faster With SEL Fault Indicators and Sensors

## Advantages of SEL Fault Indicators

- They help utilities restore service faster.
- They reduce fault-finding time by 50 percent.
- Compact, lightweight construction simplifies installation.
- Strong, simple clamping mechanisms fit various conductor sizes, ensuring fast, reliable installation.
- Displays are easy to spot and read, and require fewer holes to be drilled in a transformer cabinet for installation.
- Any SEL fault indicator that uses batteries relies on patented technology, offering the longest cumulative flashing-hour life in the industry.
- SEL fault indicators require little, if any, maintenance.
- Magnetic cable guides keep remote display and sensor wiring neatly in place.
- Standard and custom solutions are available.

Problem	SEL Fault Indicator or Sensor Solution
Need to open, enter, and pump multiple underground vaults to find a fault	RadioRANGER® Wireless Fault Indication System with Underground AutoRANGER® Fault Indicators
Paper-Insulated Lead Cable (PILC) in system requires thumping to locate faults	PILC Fault Indicators with wide range of sizes and configurations
Variable trip values on overhead lines	AutoRANGER Fault Indicators with automatic trip value adjustment based on the load current, from 50 to 1200 A
Require fault location and automatic sectionalizing within a radio mesh network	Wireless Sensor for Overhead Lines (Consult factory regarding use with other wireless networks.)
Identifying location of temporary faults	Fault Counter or Timed Reset Fault Indicator
False tripping on reclosing operations	Inrush restraint option
Require SCADA compatibility	Auxiliary contact options on underground models

## Applying SEL Fault Indicators

### Underground

Fault indicators are placed on each primary cable. If a fault causes a feeder fuse to operate, the indicators upstream of the fault trip and the indicators after the fault remain untripped. The utility can easily identify the faulted cable section without a time-consuming re-fuse and sectionalize process. Applications include subsurface or pad-mounted transformers, subsurface or pad-mounted switchgear and sectionalizing cabinets, junction boxes, and splices.

### Overhead

When a fault occurs on an overhead system, the easy-to-spot displays on the SEL fault indicators lead the line crew to the faulted line section. Applications include unfused taps, long feeders with midline reclosers or sectionalizers, overhead-to-underground transitions, and feeders that experience recurring faults.



*A Test Point Reset Fault Indicator with junction shield provides indication in a switchgear cabinet.*



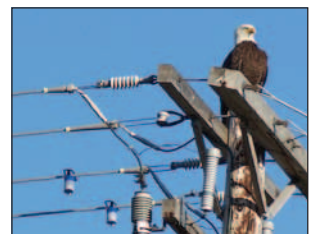
*Underground AutoRANGER® application.*



*Install the Overhead AutoRANGER with a single hot stick.*



*Wireless Sensor for Overhead Lines installation.*



*AutoRANGER Fault Indicators providing fault indication in Kodiak, Alaska.*

**Making Electric Power Safer, More Reliable, and More Economical®**

# SEL Fault Indicators and Sensors

## Applying Fault Indicators With Other SEL Products

Combine SEL fault indicators and distribution protection equipment to identify the location of a fault.

When a fault occurs, the SEL feeder relay calculates the fault location as a distance from the substation to the fault, information that could be communicated to a lineman's cell phone via the SEL-3010 Event Messenger. When a feeder has multiple taps, as shown in the diagram below, the line crew cannot determine which tap to follow to find the fault location. SEL fault indicators provide a solution by pointing the way to the correct tap, then to the faulted line section.

Combine fault indicators with recloser controls to find faults even faster. Recloser controls sectionalize the line and quickly determine the distance to a fault. Apply fault indicators to identify faulted circuits and reduce fault finding time.



*Line crews find fault locations by isolating the line section between the last tripped (red) fault indicator and the first untripped (white) fault indicator.*

