



SEL AutoRANGER™ Fault Indicators

Reduce Fault-Finding Time by 50% Using Low-Maintenance AutoRANGERS



*Underground
AutoRANGER with
Integral Display.*



Overhead AutoRANGER.

*Solutions for overhead and
underground applications.*

Features and Benefits

■ System-Wide Adaptability

The AutoRANGER family's autoconfiguration features decrease the need for crew training, selection analysis, and inventory, resulting in fewer application errors.

■ Minimal Maintenance

The AutoRANGER's ability to adjust for load fluctuations results in a decreased need for field service. For underground applications, choose a target-only (no LED) display option to eliminate the need for a battery. BEACON® LED models have a 15-plus-year product and battery life: minimize trips to the field to replace batteries.

■ Configuration Choices Optimize Performance

Ensure the best fault-indicating solution for your underground application by choosing from a wide variety of single- and three-phase display options, including remote displays that eliminate the need to open the enclosure to check the fault indicator's status.

■ Five-Year Warranty

SEL provides a full five-year warranty for all products produced by its E. O. Schweitzer Manufacturing Division, the longest warranty in the fault-indicator industry.

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



Underground AutoRANGER (AR-URD) Products and Features

Autoadjusting Trip-Level Selection

Automatic trip-level selection based on sampled load current makes the AR-URD suitable for applications with fault currents ranging from as low as 50 A to greater than 1200 A. This feature simplifies ordering and inventory and reduces maintenance and application errors.

Line-Powered Functionality

Energy required to power the microprocessor comes from monitored load current rather than a battery, decreasing maintenance and cost of ownership.

Dynamic Trip-Response Times

By monitoring current, the AR-URD automatically adjusts its trip-response time to better coordinate with upstream protection.

Current-Activated Timed Reset

Each AR-URD derives a normalization current as a function of measured circuit load. The AR-URD uses the normalization current to distinguish circuit restoration from backfeed current; it is this threshold that the AR-URD must detect before initiating the reset timer (0, 2, 4, or 8 hours). Targeted AR-URDs provide fault indication until the time criteria have been met following the detection of normalization current. The AR-URD interprets currents lower than the normalization current as backfeed, and consequently delays automatic reset.



Three-Phase "3" Display option.



Standard "V" Display option
(BEACON LED optional).



Large "L" Display option
(BEACON LED optional).



Tamperproof Bolt Display option.



Underground AutoRANGER application.



Underground AutoRANGER with Integral Display.



Underground AutoRANGER with BEACON Bolt Display.

Overhead AutoRANGER (AR-OH) Product and Features

Autoadjusting Trip-Level Selection

Automatic trip-level selection based on sampled load current makes the AR-OH suitable for applications with fault currents ranging from as low as 50 A to greater than 1200 A. This feature simplifies ordering and inventory. It also reduces application errors and maintenance.

Identify Temporary and Permanent Faults

Distinct temporary (amber) and permanent (red) fault indications provide the flexibility of tracking down self-clearing faults.

Maximize Product and Battery Life

Intelligent LED display provides an appropriate level of intensity for ambient lighting conditions. The AR-OH's battery-saving technology provides more than 2500 flashing hours.

Ensure Reliable Performance

Ramp-Down Restraint™ and Inrush Restraint features prevent false activation after extended circuit lockout and false tripping after recloser operations.



Overhead AutoRANGER.



Overhead AutoRANGER application.



Temporary fault indication.

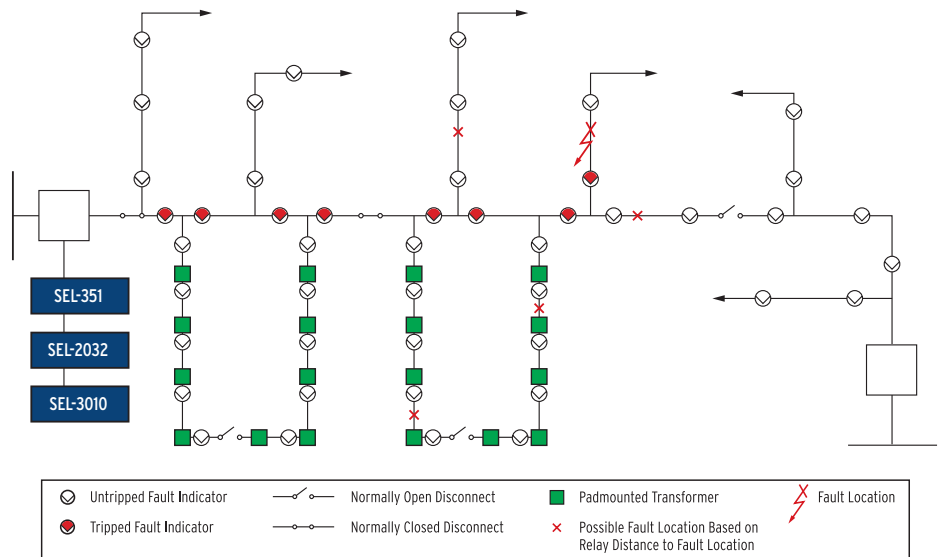


Permanent fault indication.

Applying LINAM® Fault Indicators With Other SEL Products

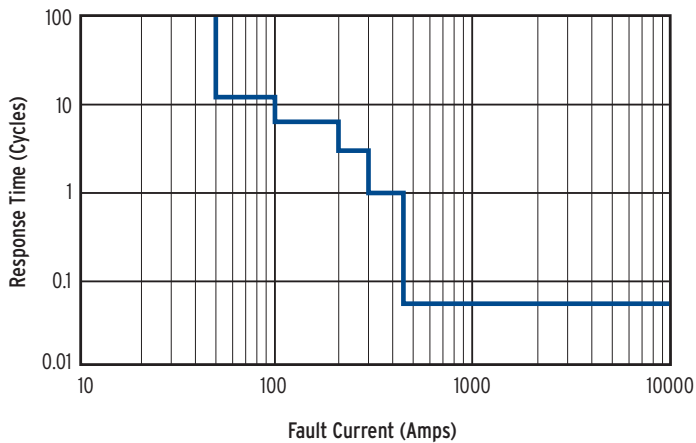
Working together, SEL fault indicators and distribution protection equipment can identify the location of a fault.

When a fault occurs, the SEL feeder relay calculates the fault location as a distance from the substation to the fault, which is communicated to a lineman's cell phone via the SEL-3010 Event Messenger. However, if a feeder has multiple taps (see diagram to the right), the relay cannot determine on which tap the fault occurred. SEL fault indicators point to the faulted section of line, which can now be correlated to the fault location provided by the relay.



SEL AutoRANGER Fault Indicators

Underground Dynamic Trip-Response Time



The Underground AutoRANGER's dynamic trip-response time improves coordination with upstream protection, maximizing reliable performance.

Overhead AutoRANGER Specifications

Fault-Sensing Range

50 to 1200 A

Voltage Range

4160 V to 69 kV

Maximum Fault Current

25 kA for 10 cycles

Timed Reset Ranges

Trip Levels	Time Period
50 to 100 A	8 hours (AR4-OH and AR8-OH)
200 to 1200 A	4 hours (AR4-OH)
200 to 1200 A	8 hours (AR8-OH)

Battery

3.6 V high-capacity 8.5 Ah lithium battery with a 20-year shelf life

Flashing Hours

2500+ hours (650 four-hour events)

Weight

1.27 lbs (575 g)

Temperature Range

-40° to +85°C (-40° to +185°F)

Designed to meet IEEE 495 standards

Underground AutoRANGER Specifications

Fault-Sensing Range

50 to 1200 A

Voltage Range

Equal to voltage class of shielded underground cable

Minimum Operating Current

3 A

Current-Activated Timed Reset

0-, 2-, 4-, and 8-hour options

Battery (for BEACON LED displays only)

3.6 V high-capacity 2.4 Ah lithium battery with a 20-year shelf life

Configuration Options

Three-Phase Sensor Configuration

Three-Phase "3" Display

Single-Phase Sensor Configuration

Integral Target Display

Standard "V" Display (BEACON LED optional)

Large "L" Display (BEACON LED optional)

Tamperproof Bolt Display (BEACON LED optional)

Dynamic Trip-Response Time

Function of trip level (see graph above)

Inrush Restraint Response Time

5 cycles

Temperature Range

-40° to +85°C (-40° to +185°F)



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