SEL Overhead and Underground AutoRANGER® Fault Indicators

LINAM® AR360, LINAM AR, and LINAM UGFI

From selection to installation, simplify your fault indicator management

- Fast, reliable fault locating reduces outage durations on overhead and underground distribution systems.
- Autoconfiguration streamlines installation, simplifies crew training, and reduces selection time.
- Automatic trip threshold adjustment eliminates device replacements to address load fluctuations.
- Versatile devices allow universal application across distribution systems with trip thresholds of 50 to 1,200 A.


SEL
AutoRANGER
AR360
Made in U.S.A.

Overhead AutoRANGER Fault Indicators

The LINAM AR360 and LINAM AR Overhead AutoRANGER Fault Indicators are self-adjusting fault indicators for overhead lines. You can apply the AR360 on distribution systems up to 34.5 kV and the AR on systems up to 69 kV. They automatically select trip thresholds based on the sampled load current and improve system reliability by indicating momentary faults before they become permanent outages.

Momentary and Permanent Fault Identification

Distinct momentary and permanent fault indications help line crews track down and prioritize faults.

Maximum Product and Battery Life

An intelligent LED display provides an appropriate level of intensity for ambient lighting conditions. This battery-saving technology provides more than 2,500 flashing hours for the AR and more than 1,800 flashing hours for the AR360.

Reliable Performance

Ramp-Down Restraint® prevents false activation after extended circuit lockout. Inrush restraint prevents false tripping during recloser operations.

AR

AR360

Momentary fault indication

Permanent fault indication

Momentary fault indication

Permanent fault indication

Key Features

Industry-Leading Adjacent-Phase Immunity

Proprietary adjacent-phase immunity technology prevents false tripping by actively rejecting magnetic fields from nearby cables. The LINAM UGFI Underground Fault Indicator is immune to magnetic fields caused by fault currents up to 25 kA on adjacent phases at 10.2 cm (4 inches) center-to-center spacing.

Secure Fault Detection

The UGFI fault detection algorithm is reliable and secure. In addition to the industry-leading adjacent-phase immunity, it can respond to switch-onto-fault (SOTF) events, adapt to inrush conditions to prevent false tripping, and avoid false resets due to backfeed conditions.

Flexible Fault Detection Thresholds

The self-adjusting AutoRANGER algorithm automatically selects the trip threshold based on a seven-day load current profile. This allows one device to be used across various applications, simplifying ordering, inventory, and installation. For applications requiring fixed trip thresholds, the UGFI can be ordered with a wide range of trip thresholds, from 25 A to 1600 A.

Rugged and Submersible Design

Install with confidence in harsh environments like underground vaults. The UGFI is waterproof at depths up to 7.6 m (25 ft) and the polycarbonate housing and stainless steel cable clamp are corrosion-resistant. It meets and exceeds IEEE 495 testing standards for faulted circuit indicators.

Line-Powered Functionality

The fault indicator harvests fault and load current to power all functions, including timed-reset and LED display options. This eliminates batteries entirely and reduces maintenance time and ownership costs.

Current Reset and Timed-Reset Options

The UGFI offers multiple reset options. Order your device with a reset based on load current (≥1 A), a fixed time duration (2, 4, 8, or 12 hours), or a combination of both for added flexibility.

Simple SCADA Interface

Use the auxiliary output contact to send the fault status through a remote terminal unit to SCADA.

Multiple Display Options

Choose a reflective mechanical target or an LED for the built-in display. Remote display options include a reflective mechanical target display, a remote LED via fiber-optic cable, and a bolt display that is discreet, tactile, and tamper-proof.

RadioRANGER® Remote Fault Indication

Read the fault status without accessing the vault or enclosure using the SEL-8310 RadioRANGER Remote Fault Reader. The RadioRANGER transmitter connects to the UGFI and uses a short-range wireless signal to communicate the fault status to a handheld receiver.

Optional remote mechanical target display

Fiber-optic LED extension cable

Tamper-proof bolt display

UGFI shown connected to the RadioRANGER Underground Wireless Fault Indication System

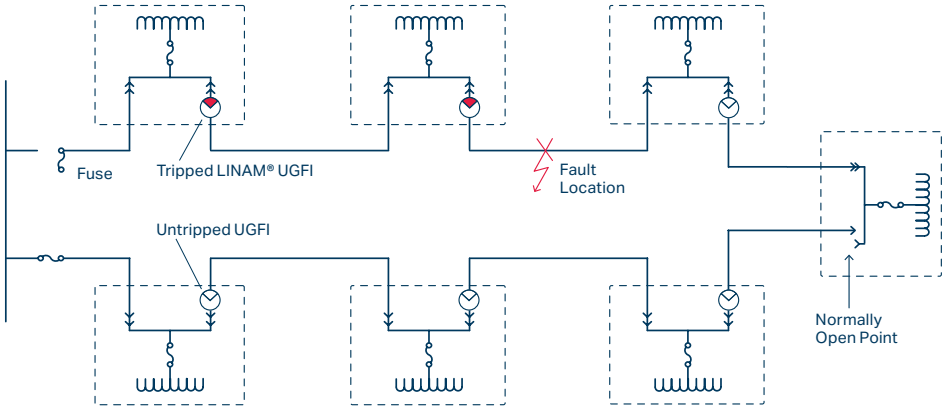
Wireless interface

Remote fault reader

Application Examples

Pad Mount

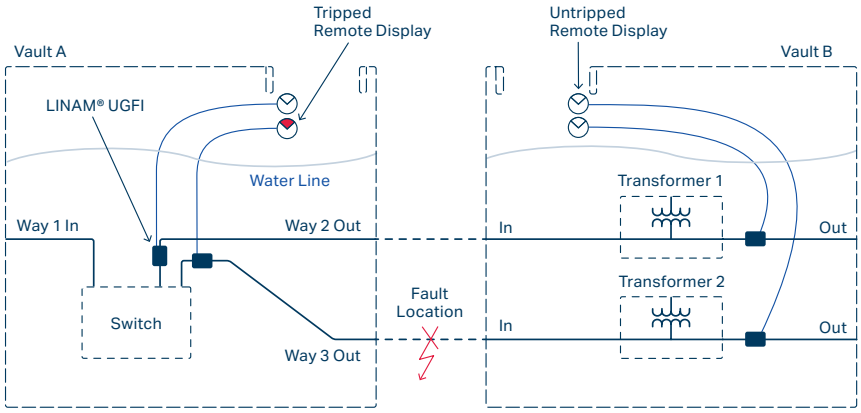
Install the UGFI in pad-mounted enclosures to identify faults in the underground cable between enclosures. Use it across all your pad-mounted applications, including transformers, switchgear, sectionalizing cabinets, and junction boxes.



The fault indicators identify the faulted cable section within a loop of pad-mounted transformers that contain a normally open point.

Subsurface

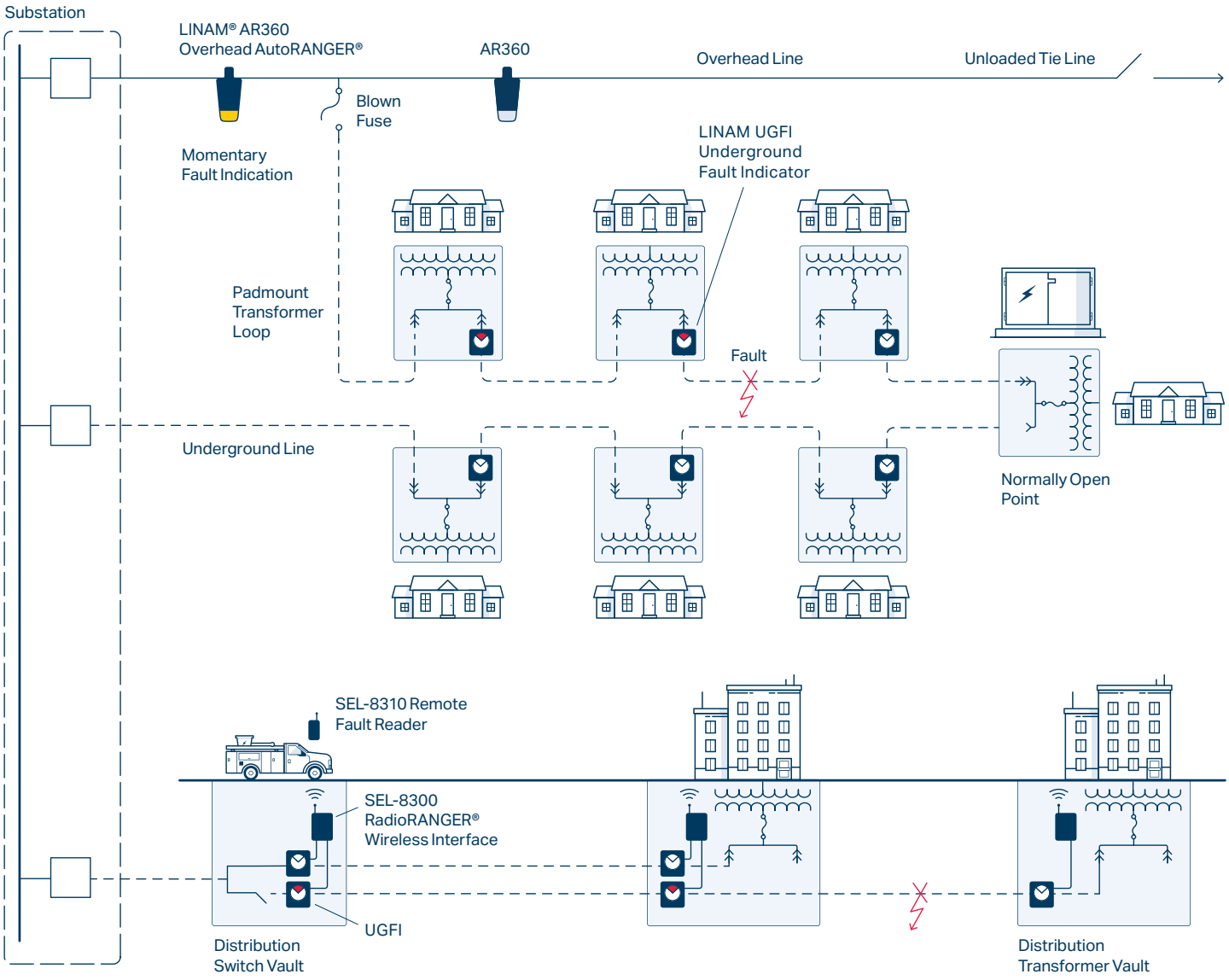
Apply the UGFI to underground cables within subsurface vaults and maintenance holes to identify faulted cable sections. The UGFI is submersible, withstanding depths up to 7.6 m (25 ft). Remote display options make the fault status indication visible at a convenient location for workers. The RadioRANGER option communicates the fault indicator status to a handheld receiver, allowing personnel to read the status of a subsurface device at street level.



Apply fault indicators to outgoing ways of switches and transformers to determine if the fault is beyond the installed (or monitored) location.

Complete Fault Indication Solution

Working together, SEL fault indicators and distribution protection equipment help line crews identify the exact location of a fault. If a fault occurs, an SEL feeder relay calculates the fault location as a distance from the substation to the fault. However, if a feeder has multiple taps (see figure), the relay cannot determine on which tap the fault occurred. SEL fault indicators direct the line crews to the faulted section of the line, which can be correlated to the fault location provided by the relay.



Specifications

Overhead	LINAM AR	LINAM AR360
Trip Threshold Range	50 to 1,200 A	50 to 1,200 A
Voltage Range (phase-to-phase)	4,160 V to 69 kV	4,160 V to 34.5 kV
Maximum Fault Current	25 kA for 10 cycles	25 kA for 10 cycles
Trip Response Time	24 ms, nominal	24 ms, nominal
Permanent Flash-Clearing Times		
50 and 100 A Trip Levels	8 hours	8 hours
200 and 1,200 A Trip Levels	4 or 8 hours	4 or 8 hours
Momentary Flash-Clearing Times	0 (disabled), 4, 8, 16, or 24 hours	0 (disabled), 4, 8, 16, or 24 hours
Flash Hours	2,500 hours	1,800 hours
Outer Diameter Clamping Range	0.162" to 1.50"	0.162" to 1.50"
Battery	3.6 V high-capacity 8.5 Ah lithium battery with a 20-year life	3.6 V high-capacity 17 Ah lithium battery with a 20-year life
Approximate Weight	600 g (1.30 lbs)	840 g (1.85 lbs)
Temperature Range	−40° to +85°C (−40° to +185°F)	−40° to +85°C (−40° to +185°F)

Underground	LINAM UGFI
Trip Thresholds	25 to 1,600 A
Immunity From Adjacent-Phase Fault Current	25 kA at 10.2 cm (4 in) on center between phases
Maximum Fault Current Withstand	40 kA for 10 cycles
Clamping Range	15.24 to 66.04 mm (0.6 to 2.6 in)
Current Reset Option	≥1 A for as long as 10 minutes
Timed-Reset Option	2, 4, 8, or 12 hours
Timed Reset With Current Reset Override	Timed-reset duration (2, 4, 8, or 12 hours) or ≥1 A (whichever occurs first)
Fault Detection Time	As fast as 1.5 cycles; 2 cycles typical
Approximate Weight	453.59 g (3 lb)
Temperature Range	−40° to +85°C (−40° to +185°F)
Product Certification	IEEE 495—Guide for Testing Faulted Circuit Indicators

SCHWEITZER ENGINEERING LABORATORIES

Making Electric Power Safer, More Reliable, and More Economical
+1.509.332.1890 | info@selinc.com | selinc.com

PF00131 • 20260331