SEL-WSO
Overhead Wireless Sensor

Improve overhead distribution reliability metrics with remote circuit monitoring

• Wireless network reporting centralizes load and fault monitoring for improved operational efficiency.
• AutoRANGER® auto-adjusting trip threshold technology reduces false trips.
• Over-the-air upgrades and ten-year product warranty reduce the cost of ownership.
Product Overview

Remote Monitoring
Apply SEL-WSO Overhead Wireless Sensors to improve distribution system reliability by remotely monitoring circuits for faults and outages. Using centrally reported data, dispatch repair personnel directly to the faulted line section, reducing outage durations. You can also periodically log circuit load data for system analysis and can remotely monitor the system.

The SEL-WSO provides a complete solution for overhead distribution fault location.

- **Spring-loaded clamp** secures the device to overhead conductors.
- **UV-stabilized polycarbonate housing** provides years of maintenance-free operation.
- **Integral antenna** sends and receives data over a Trilliant® RPMA® network.
- **Mechanical flag display** provides local indication of the device state.
- **Quick installation** with a single standard hot stick.
Key Features

Fault Detection
Identify fault locations quickly and remotely on overhead distribution circuits. The SEL-WSO automatically selects the best trip threshold based on the measured load current. Eight distinct trip thresholds from 50–1,200 A provide system-wide flexibility. When the current exceeds the configured trip threshold, the SEL-WSO determines whether the event is a permanent or a momentary fault.

RPMA Network Connection
The SEL-WSO transmits on the license-free 2.4 GHz ISM frequency band over the RPMA network for reliable communication. View all the SEL-WSO data with a web-based display, and send alerts via email to personnel.

Local Display
Observe the state of the SEL-WSO in the field with the integrated mechanical flag display. The reflective flag provides a visual alert for tripped sensors. Permanent faults are always indicated. In addition, you can configure the flag to indicate any combination of the following: permanent loss-of-current (LOC), momentary LOC, momentary fault, disturbance, and load pickup events.

Upon radio activation, the mechanical flag display trips. When the SEL-WSO connects to the RPMA network and arms, the flag resets, indicating that the sensor is ready to detect future events.

Load Data Reporting
Monitor the load current with the SEL-WSO, and approximate circuit loading across the entire distribution circuit. The SEL-WSO reports load data at every update interval (24 hours by default). The SEL-WSO sends load data in either average or peak values.

Outage Detection
Detect outages on overhead distribution circuits to pinpoint the affected area. The SEL-WSO detects a loss of current after any protection operation and evaluates the duration to determine if it was a permanent or momentary outage. Configure the SEL-WSO to either send an exception report or wait until the next update interval to report the outage.

Inrush Restraint
Improve the dependability of reported fault events on circuits that implement an automatic reclosing scheme with inrush restraint. Upon detecting a protection operation (e.g., a loss of current), the sensor enters Inrush Restraint mode and will not register events based on inrush currents from reclosing attempts. The sensor automatically resets and rearms after the load current is restored.

Configurable Update Interval
Optimize the update interval to achieve high-resolution load data. Configure the SEL-WSO update interval to 6, 12, or 24 hours. Select shorter update intervals for higher-resolution load data. The sensor reports 24 load data points per update interval (e.g., a 6-hour update interval results in 15-minute load data resolution).

Wireless Reporting
Retrieve data from the SEL-WSO wirelessly by scheduled recurring reports or by event-triggered reports. The SEL-WSO provides the following reports:
- Periodic updates (24 hours by default)
- Exception reports:
  - Deployment
  - Restoration
  - Permanent fault
  - Permanent loss of current
  - Momentary fault
  - Momentary loss of current
  - Disturbance
  - Load pickup
**Over-the-Air Updates**
Upgrade the SEL-WSO with the latest firmware and modify settings in the field by sending over-the-air updates. You can distribute over-the-air updates globally to all SEL-WSO devices on the network or target specific units.

**Long Battery Life**
Reduce fault indicator maintenance and the cost of ownership with the extended battery life of the SEL-WSO. The sensor has an operational life of over 14 years when configured with a 24-hour update interval and transmitting as many as 44 asynchronous exception reports per year. The sensor measures and reports the battery voltage in every transmitted report and alerts personnel when the battery is low.

## Specifications

### General

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Nominal System Voltage</strong></td>
<td>Voltage (L-L): Up to 34.5 kV</td>
</tr>
<tr>
<td><strong>Nominal Inrush Restraint</strong></td>
<td>Response time: 75 ms</td>
</tr>
<tr>
<td><strong>Outer Diameter Mounting</strong></td>
<td>Range: 4.1–38.1 mm (0.16–1.50 in)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>High-capacity lithium battery with a 20-year shelf life</td>
</tr>
<tr>
<td><strong>Fault Detection</strong></td>
<td>Trip threshold range: 50–1,200 A</td>
</tr>
<tr>
<td></td>
<td>Trip threshold accuracy (at 0.75&quot; conductor diameter): ±30%</td>
</tr>
<tr>
<td></td>
<td>Maximum fault current: 25 kA</td>
</tr>
<tr>
<td></td>
<td>Nominal trip response time: 24 ms (default)</td>
</tr>
<tr>
<td><strong>Load Measurement</strong></td>
<td>Current range: 0–600 A</td>
</tr>
<tr>
<td><strong>Current Measurement</strong></td>
<td>Accuracy (at 0.75&quot; conductor diameter): ±25% (5–600 A)</td>
</tr>
<tr>
<td><strong>Radio</strong></td>
<td>Operating frequency: 2.4 GHz ISM band</td>
</tr>
<tr>
<td></td>
<td>Report status update: 24 hours (default)</td>
</tr>
<tr>
<td></td>
<td>Network: Trilliant RPMA network infrastructure</td>
</tr>
<tr>
<td><strong>Regulatory</strong></td>
<td>Federal Communications Commission: FCC Part 15, Subpart B (Unintentional Radiators)</td>
</tr>
<tr>
<td></td>
<td>Industry Canada: ICES-003, Issue 5, Class B (Unintentional Radiators)</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>Operating: −40° to +85°C (−40° to +185°F)</td>
</tr>
<tr>
<td></td>
<td>Storage: −40° to +85°C (−40° to +185°F)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>728 g (1.6 lb)</td>
</tr>
</tbody>
</table>

### Applications
Expand SEL-WSO deployment to all overhead distribution applications, including:
- Unfused taps
- Mid-feeder disconnect or sectionalizers
- Long feeders
- Overhead-to-underground transition points
- Feeders that experience recurring faults
- Lightly loaded circuits

---

**SEL SCHWEITZER ENGINEERING LABORATORIES**

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

© 2019 by Schweitzer Engineering Laboratories, Inc.
PFO0277 • 20190502