

SEL WSO-11

Wireless Sensor for Overhead Lines



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.

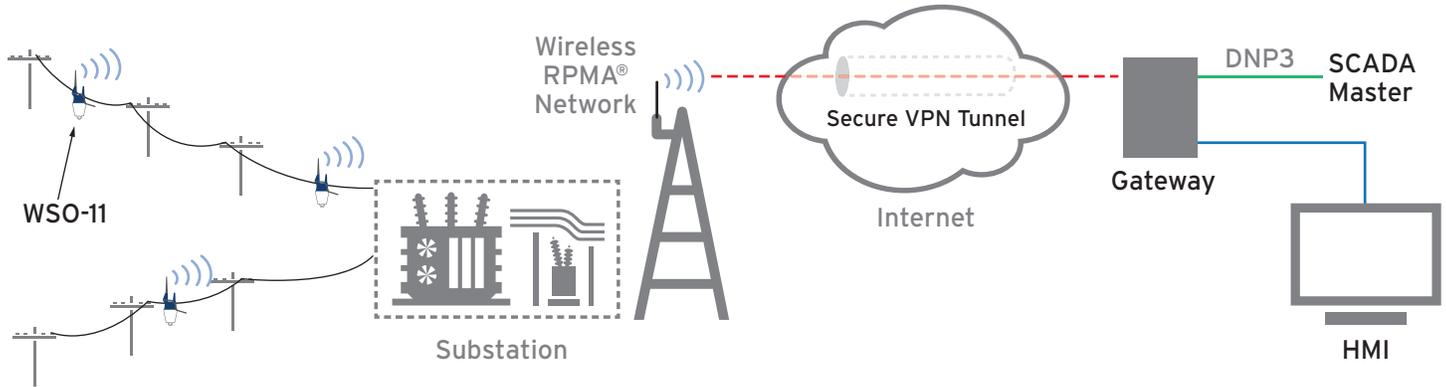


Product Overview

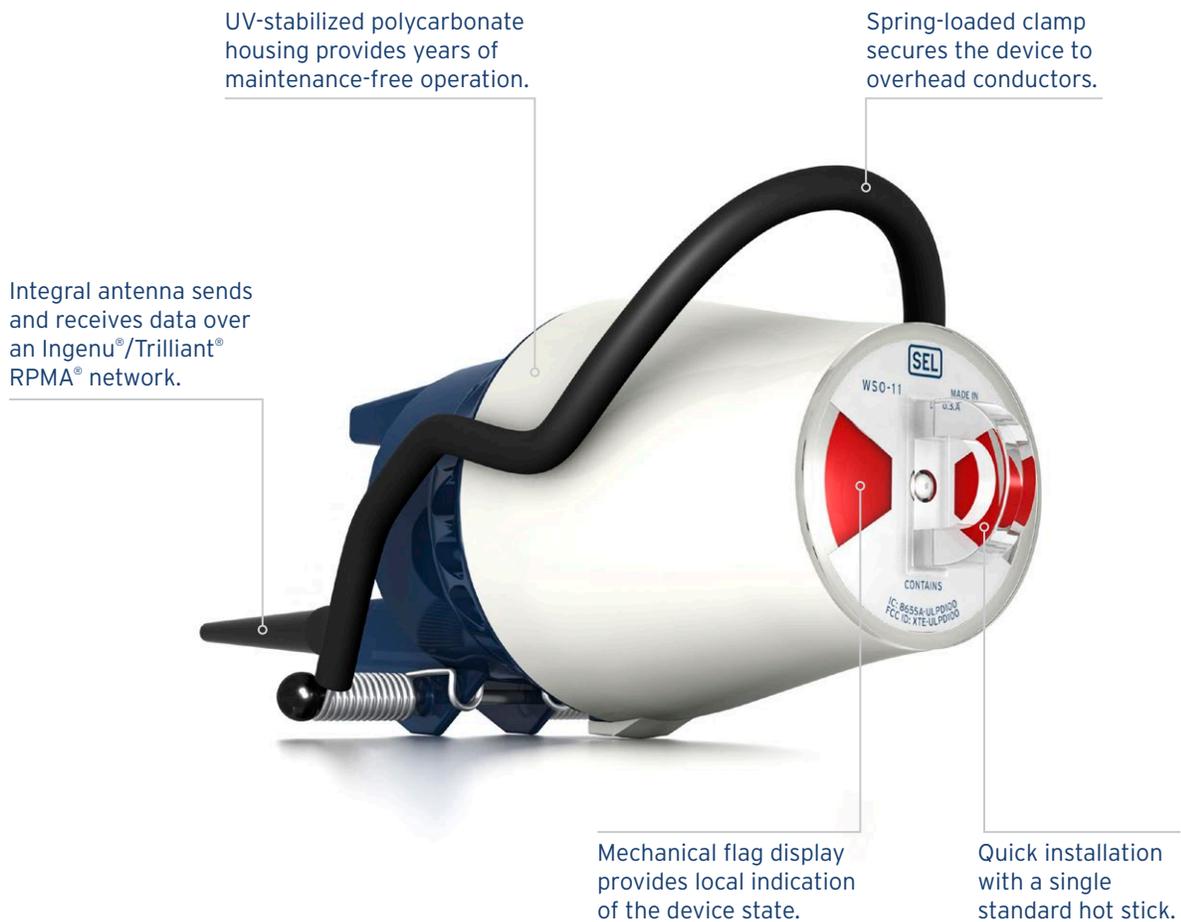
Remote Monitoring

Apply WSO-11 Wireless Sensors for Overhead Lines 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-11 Wireless Sensor provides a complete solution for overhead distribution fault location.



Key Features

Fault Detection

Identify fault locations quickly and remotely on overhead distribution circuits. The WSO-11 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 WSO-11 determines whether the event is a permanent or a momentary fault.

RPMA Network Connection

The WSO-11 transmits on the license-free 2.4 GHz ISM frequency band over the RPMA network for reliable communication. View all the WSO-11 data with a web-based display, and send alerts via email to personnel.

Local Display

Observe the state of the WSO-11 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 WSO-11 connects to the RPMA network and arms, the flag resets, indicating that the sensor is ready to detect future events.

Load Data Reporting

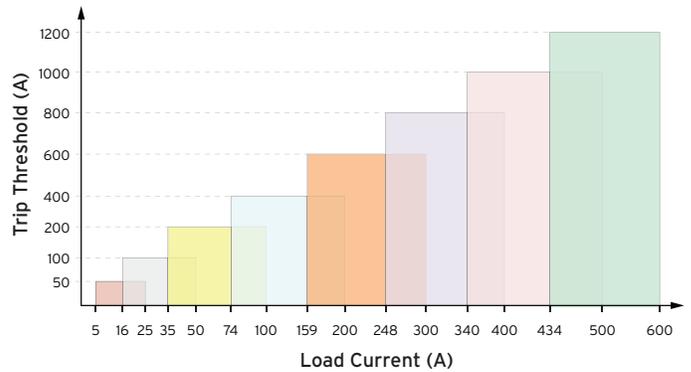
Monitor the load current with the WSO-11, and approximate circuit loading across the entire distribution circuit. The WSO-11 reports load data at every update interval (24 hours by default). The WSO-11 sends load data in either average or peak values.

Outage Detection

Detect outages on overhead distribution circuits to pinpoint the affected area. The WSO-11 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 WSO-11 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.



AutoRANGER trip logic automatically adjusts the trip threshold as a function of load current (not to scale).



The WSO's reflective flag provides a visual alert for tripped or faulted sensors.

Configurable Update Interval

Optimize the update interval to achieve high-resolution load data. Configure the WSO-11 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 WSO-11 wirelessly by scheduled recurring reports or by event-triggered reports. The WSO-11 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 WSO-11 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 WSO-11 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 WSO-11. 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.

Applications

Expand WSO-11 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

Specifications

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



Making Electric Power Safer, More Reliable, and More Economical
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