

TLSM™ Security Monitor

Real Time Transmission Tower Security Monitor

Self-powered intrusion detection monitor for critical transmission tower installations.

The Lindsey TLSM security monitor provides early warning of intrusion around the base of transmission towers and attempts to compromise tower integrity.

Suitable for use on most structures including dead-end towers located at critical locations such as river, valley, or road crossings. Infrared sensors detect human presence at the tower base while accelerometers monitor conductor vibration patterns associated with tower tampering. The TLSM security monitor is an effective, easily installed, self-powered transmission tower intrusion monitoring solution for system voltages up to 765kV.

Human Intrusion Detection

When installed on the energized (hot) end of an insulator string, the Lindsey TLSM security monitor's onboard infrared (IR) sensor detects and reports the presence of a human heat signature in the area at the base of the tower.

Tower Tamper Detection

Three-axis MEMS accelerometer and built-in Fast Fourier Transform (FFT) processing monitors the vibration frequency patterns on the conductor. Built-in algorithms developed by the U.S. Department of Energy's Idaho National Laboratory analyze these patterns to detect and report tower vibrations indicative of tower tampering, such as cutting or unbolting tower steel.

Smart Alarms with Activity Level

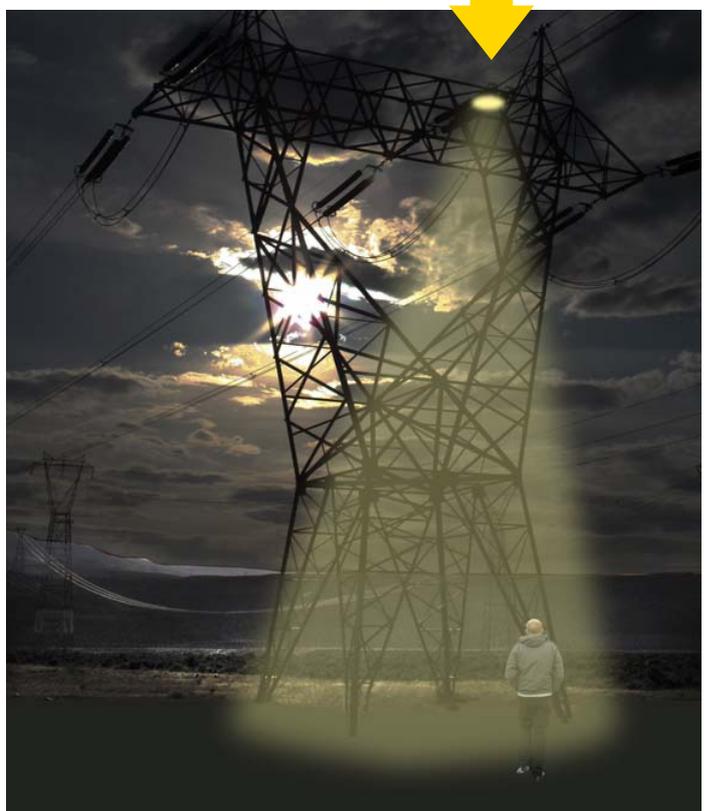
When both the IR and vibration algorithms sense activity, an intrusion alarm is issued. By monitoring the level of both types of activity, the TLSM also reports an activity level with the alarm. This Smart Alarm provides additional confidence in determining how, and how quickly, to respond.

Self-Powered, Simple Installation

Self-powered by line current as low as 80A. Fast live line installation using hot stick or bare hand practices through system voltages up to 765kV L-L.

Reliable, See Anywhere, Satellite Communications

Satellite radio ensures reliable communications in even the most remote locations with no dependence on any other infrastructure. Use of the Iridium® satellite network requires no other hardware to be installed on the line other than the TLSM devices, and requires no other setup



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or configuration effort as is typically associated with ground based communications or an RTU. TLSM monitors are factory configured for immediate connection to the Iridium network after installation.

Flexible Data Output

All data may be directly passed as SCADA points for immediate use with the need for additional software. Lindsey's TLSM dashboard application provides a graphical view of security monitor status, and may be accessed from the cloud.



Simple Installation

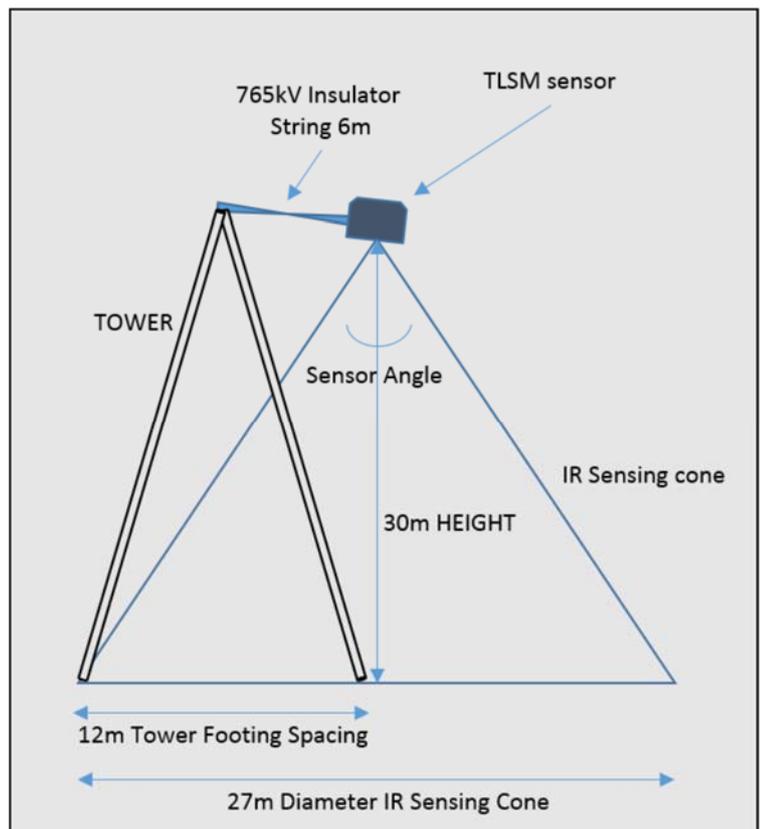
The TLSM can be installed with the line energized or de-energized. Hotstick, helicopter, and bare hand installation

Typical Application

The figure at right shows how a single TLSM security monitor can be mounted at the end of the insulator string on a dead-end transmission tower to provide full intrusion detection around the base of even EHV towers. One TLM security monitor is mounted on the center-phase conductor at the end of one tension insulator string. The field of view of the downward looking monitor provides an IR view of all tower footings. The monitor senses vibration patterns in the conductor associated with tower

SPECIFICATIONS

Parameter	Specification
Conductor operating current	80A min - 1500A max
Conductor voltage	765kV L-L max
AC voltage frequency	50Hz - 60Hz
Conductor temperature	356°F (180°C) max
Conductor size	Up to 1.8" (46mm)
Conductor type	Aluminum or copper
Infrared sensor lens angle	50°
Effective installation height	35m maximum
Power	Self-powered
Communications	Iridium satellite radio (built-in)
Operating ambient temperature	158°F (70°C) max
Dimensions	16.5" (L) x 6.75" (W) x 8.75" (H) (420mm x 170mm x 220mm)
Weight	17 lbs (7.7kg)



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U.S. Patents 7,786,894 and 8,738,318 and other U.S. and foreign patents pending.

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