

TECHNICAL DATA SHEET

LIGHTNING PROTECTION INTERNATIONAL PTY LTD
Comprehensive Lightning and Surge Protection ABN 11 099 190 897



- Direct Strike Protection
- Earthing Products & Solutions
- Surge & Transient Protection for Power, Data, Communications and RF Lines

LPI® Lightning Warning System - LWS MKIII

Features

- Early detection of lightning activity within approximately 25km
- “Alarm” signalled when lightning approaches within approximately 8-10km
- All Clear indication provided once the storm has passed
- Wireless communication between console and multiple sensors
- Flexible installations to suit different applications

Product Description

The LPI Lightning Warning System is a non-directional lightning detection instrument designed to provide indication of nearby lightning strikes and significant changes in the local electrostatic field. The LPI Lightning Warning System MKIII provides the user with the ability to manage the lightning risk and to fulfil a duty of care to employees, customers and all related personnel. As occupational health and safety laws strengthen globally, senior management across a wide variety of industries and recreational pursuits are now faced with a realisation that they have a duty to warn individuals of the pending risks associated from lightning. Recent court cases have shown a dramatic change from the once acceptable “Act of God” defence, to a realisation that management now has a duty to warn.

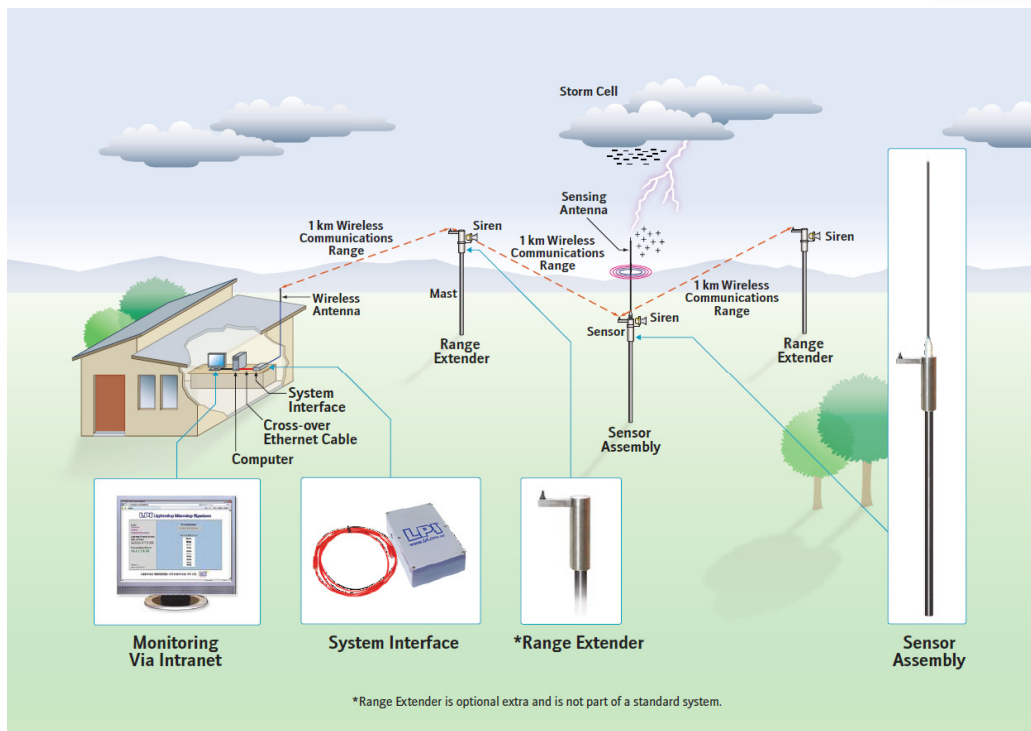


Figure 1: Lightning Warning System Overview

LWS Operation

On detection of a nearby lightning event or significant increase in the electrostatic field, the system will provide a Warning or Alarm to personnel that an event has occurred or is likely to occur. Detection and Alarm Indication (via a siren) is performed by the sensor unit (see figure 2), with results being sent wirelessly to the console for more detailed event indication and logging. (see figure 1)

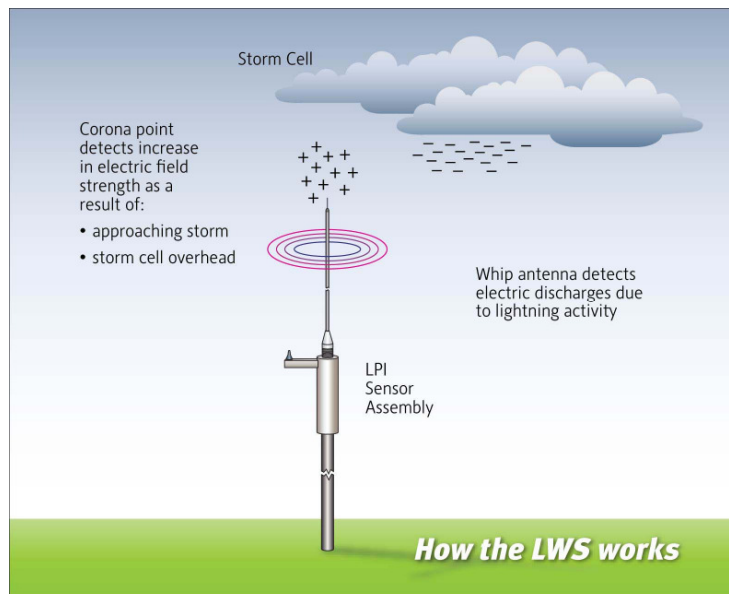


Figure 2: How the LWS works

LWS Functionality

LWS Console

The LWS MkIII Console is the interface which communicates to the sensors installed in the field and allows the user to access information about the current lightning event status (near, far or all clear) and the current electrostatic field level (high or low electric-field). The Console is typically sited in a secure location where it can either be connected directly to a computer by cross-over Ethernet cable, or by straight-through Ethernet cable to a local network, allowing the user to access the relevant data and system settings. The Console also has alarm relay outputs for Alarm, Warning and All Clear suitable for switching contacts.

LWS Sensor Assembly

The LWS Sensor Assembly (Microprocessor, Sensing Antenna, Alarm/Warning/All Clear Indicator and Earth Rod) is the integral component of the LWS system, it provides all decision making in regards to recorded lightning events and subsequent alerts.

The LWS Sensor Assembly is typically mounted at a suitable location at site and the monitoring of all lightning activity is controlled by an on board microprocessor, which works in conjunction with the sensing antenna to detect changes in the electric field and approaching lightning discharges. Depending on the intensity of the electric field or proximity of the lightning, the sensor provides an event indication via wireless communication to a receiving antenna and console unit which is positioned within 1 km line of sight of the sensor.

Each sensor also contains an Alarm/Warning/All Clear Indication device. Depending on customer preference this is provided by a siren and/or an LED display, which allows the user to communicate situation events to all personnel in accordance with site safety policies and procedures.

Depending on the layout of the site and the area to be monitored, LPI can customize a solution which uses multiple sensors in the field. The multiple sensor arrangement allows for a voting methodology to be engaged by the system, this uses results provided by individual sensors to determine the lightning risk.

LPI can also provide a suitable Mounting Pole (OD 70mm, ID 61.5mm) to mount the LWS Sensor Assembly to. If the Mounting Pole option is included, suitable locking bolts are also provided to keep the LWS Sensor Assembly secure.

Event Indication Levels

As the LWS MkIII sensor detects lightning activity or increases in the electric field, event indications are made at the Sensor and are communicated to the Console for processing. If the event falls within a predetermined level, the following indications are provided to the user.

Warning Indication

A Warning Indication occurs when either a far lightning strike or a low electric field is detected. Far lightning strikes are defined as lightning events that occur within a radius of approximately 10 to 25km of the sensor. Low electric-field events are defined as being when the local electric field rises above a level of 3kV/m. A Warning status provides the user with an indication, that a storm is within a relatively close range and may move towards the area where the sensors are stationed. When a storm is within 25km it may arrive in the area in approximately 20-30 minutes.

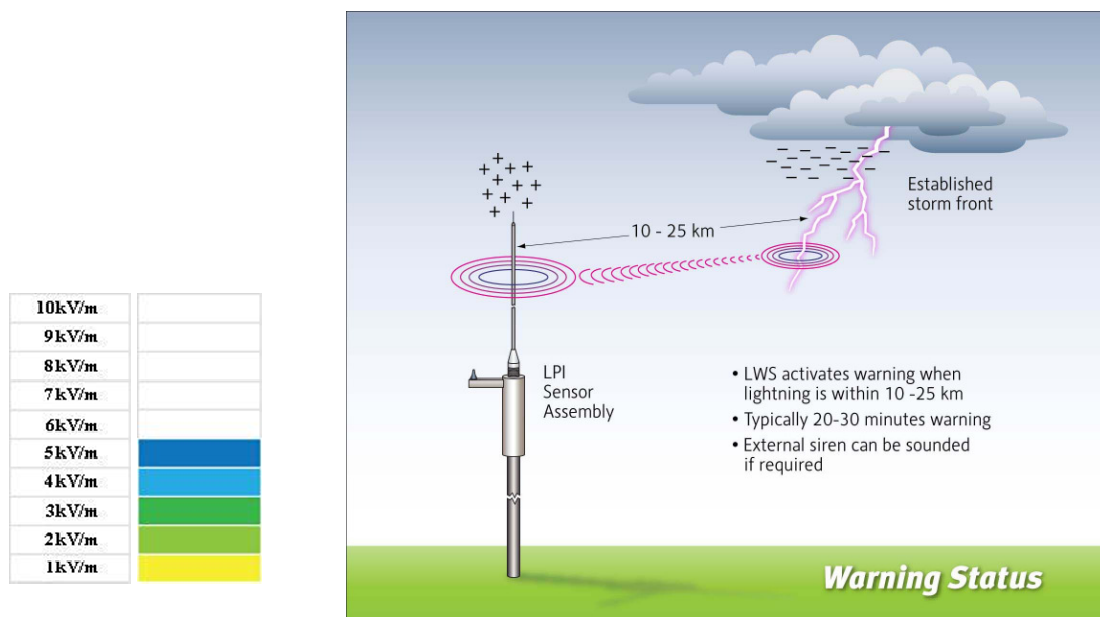


Figure 3: Warning Status at above 4kV/m

Alarm Indication

An Alarm Indication occurs when a near lightning strike or high electric field is detected. Near lightning strikes are defined as lightning events that occur within a radius of approximately 8 to 10km of the sensor, which are close enough to pose a significant risk within approximately 10-15 minutes. High electric field events are defined as being when the local electric field rises above 7kV/m. An Alarm status provides to the user an indication that current activities at site should be suspended, allowing shelter to be taken in accordance with established safety procedures.

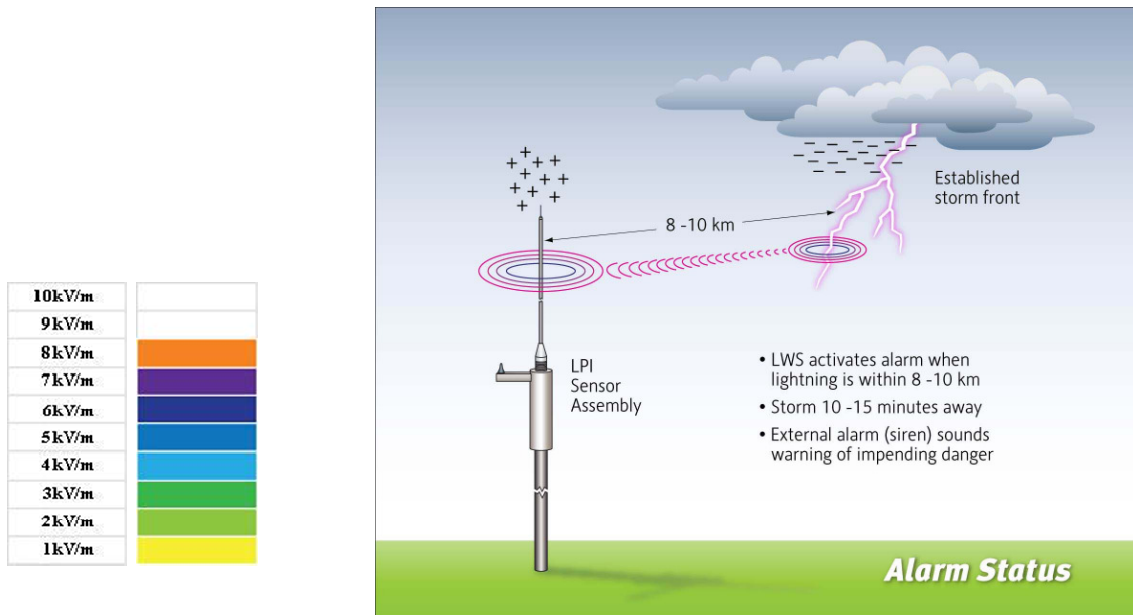


Figure 4: Warning Status at above 7kV/m

All Clear Indication

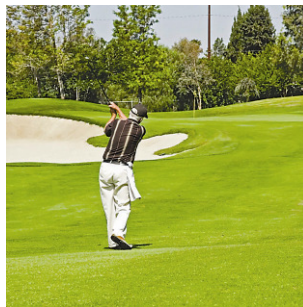
An All Clear Indication is given when no activity (far strikes, near strikes, low electric field or high electric field) has occurred within 15-30 minutes (programmable). After this period of no activity it is deemed safe to resume all activities.

Applications

The LPI LWS MKIII is suitable for use in all open areas where human traffic and / or sensitive operations are subjected to the threat of lightning strikes. In situations where large open areas covering many kilometres require monitoring, LPI's customized multiple sensor arrangement provides a high degree of accuracy in providing a safe working environment.

Typical industry and recreational applications for the LPI LWS include:

- Mining sites including applications where explosives are used for blasting purposes
- Military
- Construction sites
- Airports
- Ship loading facilities
- Refuelling facilities
- Power generation
- Oil and Gas facilities
- Schools
- Theme Parks
- Open Air events such as festivals and concerts
- General outdoor recreational activities
- Horse Racing Tracks
- Golf Courses
- Sports Stadiums
- Rail and Transport
- Industrial



Comprehensive Lightning and Surge Protection Solutions

The LPI Lightning Warning System is only one aspect of the overall lightning protection strategy, required for comprehensive structural, personnel and equipment safety. The installation of LPI's LWS in conjunction with the following range of LPI products, ensures a complete solution to your lightning problems.



Correctly installed direct strike protection systems such as the LPI Guardian and Stormaster range of air terminals, provides structural and area protection from direct lightning strikes.



Surge and Transient protection products for powerline, shunt and series protection for applications in protecting power supply at the point of entry to your facility and protecting power supply to sensitive equipment.



Surge and Transient protection products for data, communications and signal lines.



A comprehensive range of earthing products and accessories for a low impedance earthing system.

Technical Data

LPI offers two alternative packages for the LWS MK III.

- **Package A.** 1 x Sensor and antenna assembly (6-12V DC Power Supply), console and siren.
- **Package B.** 1 x Sensor and antenna assembly, solar panel power supply for sensor, console and siren.

Customized systems using multiple sensors can be configured to suit customer requirements, contact LPI or an authorised representative for a customized design.

Ordering Code	LWS-MKIII
Description:	LPI® Lightning Warning System
Model:	LPI® LWS MK III
Control Console	
Box:	Die-Cast, 152mm (L) x 83mm (W) x 50mm(H)
Control:	Micro Processor Controlled
Interface:	Webpage (default address 192.168.1.90)
Operation:	Console receives electrostatic field measurements and event notification from sensors in the field and displays received information on an easy to read webpage. Allows users to download and save a log of events that have occurred. Allows users to change a range of settings.
Relay Output:	3 Outputs (All Clear, Warning and Alarm)
Weight:	840g
Colour:	Grey
Power Supply:	6V plug pack (110V/240V)
Wireless Frequency:	2.4GHz
Sensor Assembly	
Construction:	Stainless Steel
Lightning Discharge Detection Range:	Far Strike, Approximately 10-25km Near Strike, Less than approximately 10km
Electric Field Measurement:	Negligible, Approximately $\pm 0-4\text{kV/m}$ Low E-field, Approximately $\pm 4-7\text{kV/m}$ High E-field, Approximately $\pm 7-10\text{kV/m}$
Relay Output:	3 Outputs (All Clear, Warning and Alarm)
Wireless Frequency:	2.4 GHz
Colour:	Bare Stainless Steel
Weight:	8kg
Power Supply:	Package A — 12Vdc plug pack (110V/240V) Package B — 12Vdc solar panel and storage battery

Solar Panel	
Voltage:	12 Volt
Power:	20 Watt
Size:	639mm x 294mm x 23mm
Weight:	2.4kg
Type:	Monocrystalline

For Operation and Installation please refer to LWS MK III Installation and Operating Manual



CERTIFIED QUALITY
MANAGEMENT SYSTEM

— ISO 9001 —

Accreditation number: S1220792AS

Lightning Protection International Pty Ltd operates a certified management system that complies with the requirements of AS/NZS ISO9001:2000. The scope of certification encompasses the design, manufacture, assembly, sales, installation and commissioning of lightning and surge protection equipment and earthing material.