
# Lightning Detection

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# What is lightning detection

A lightning detector is a device that detects lightning produced by thunderstorms. Long-range lightning detectors are helpful for advance planning, and can track and display lightning storms in real time on a PC or Laptop up to 600Km away.

There are three primary types of detectors:

- ground-based systems using multiple antennas,
- mobile systems using a direction and a sense antenna in the same location
- space-based systems.

# How does it work?

- A lightning discharge generates both a radio frequency (RF) and very short duration light pulses, providing the visible "flash".

- RF signals and light pulses rarely occur simultaneously except when produced by lightning, RF sensors and light pulse sensors can usefully be connected in a “coincidence circuit” which requires both kinds of signals simultaneously in order to produce an output. If such a system is pointed toward a cloud and lightning occurs in that cloud, both signals will be received. The coincidence circuit will produce an output and the user can be sure the cause was lightning.

- The Lightning detection system can detect lightning activity up to 600km monitoring the following strikes:
  - Positive cloud to ground strikes +CG
  - Negative cloud to ground strikes –CG
  - Positive intercloud strikes +IC
  - Negative intercloud strikes -IC

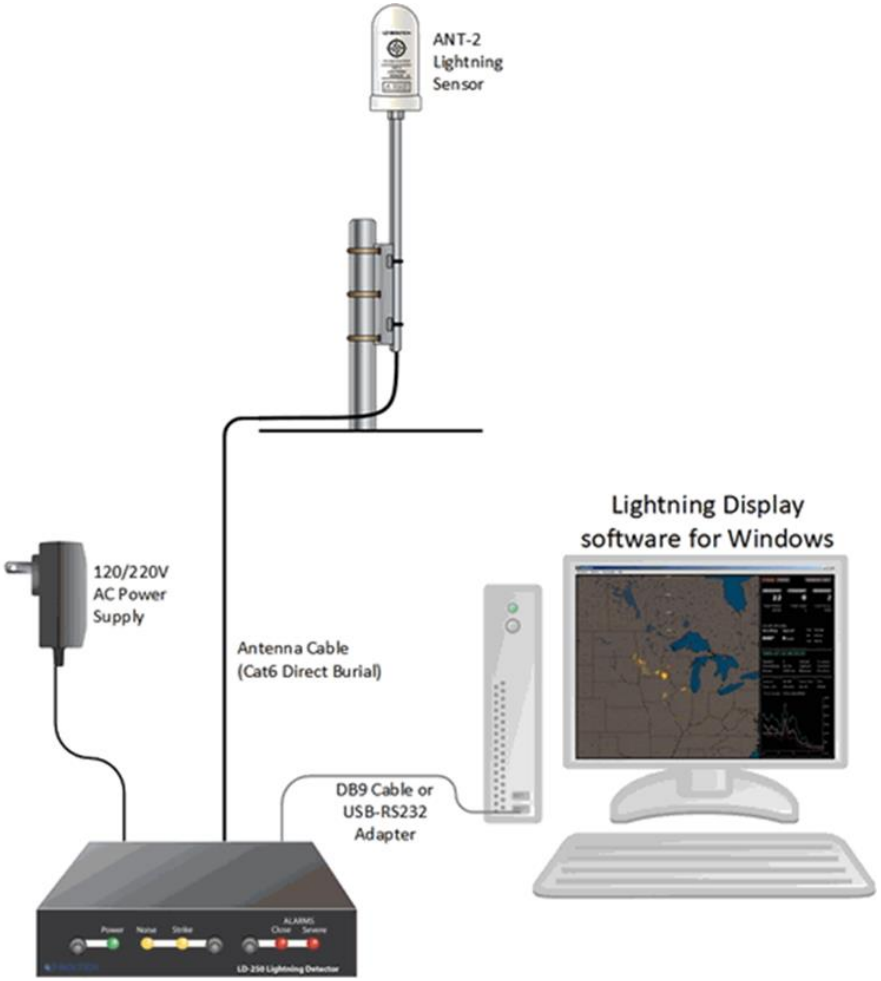
# How does it work?

- Ground-based and mobile detectors calculate the direction and severity of lightning from the current location using radio direction-finding techniques along with an analysis of the characteristic frequencies emitted by lightning.

- Ground-based systems use triangulation from multiple locations to determine distance, while mobile systems estimate distance using signal frequency and attenuation.

- Space-based detectors on satellites can be used to locate lightning range, bearing and intensity by direct observation.

# Typical system

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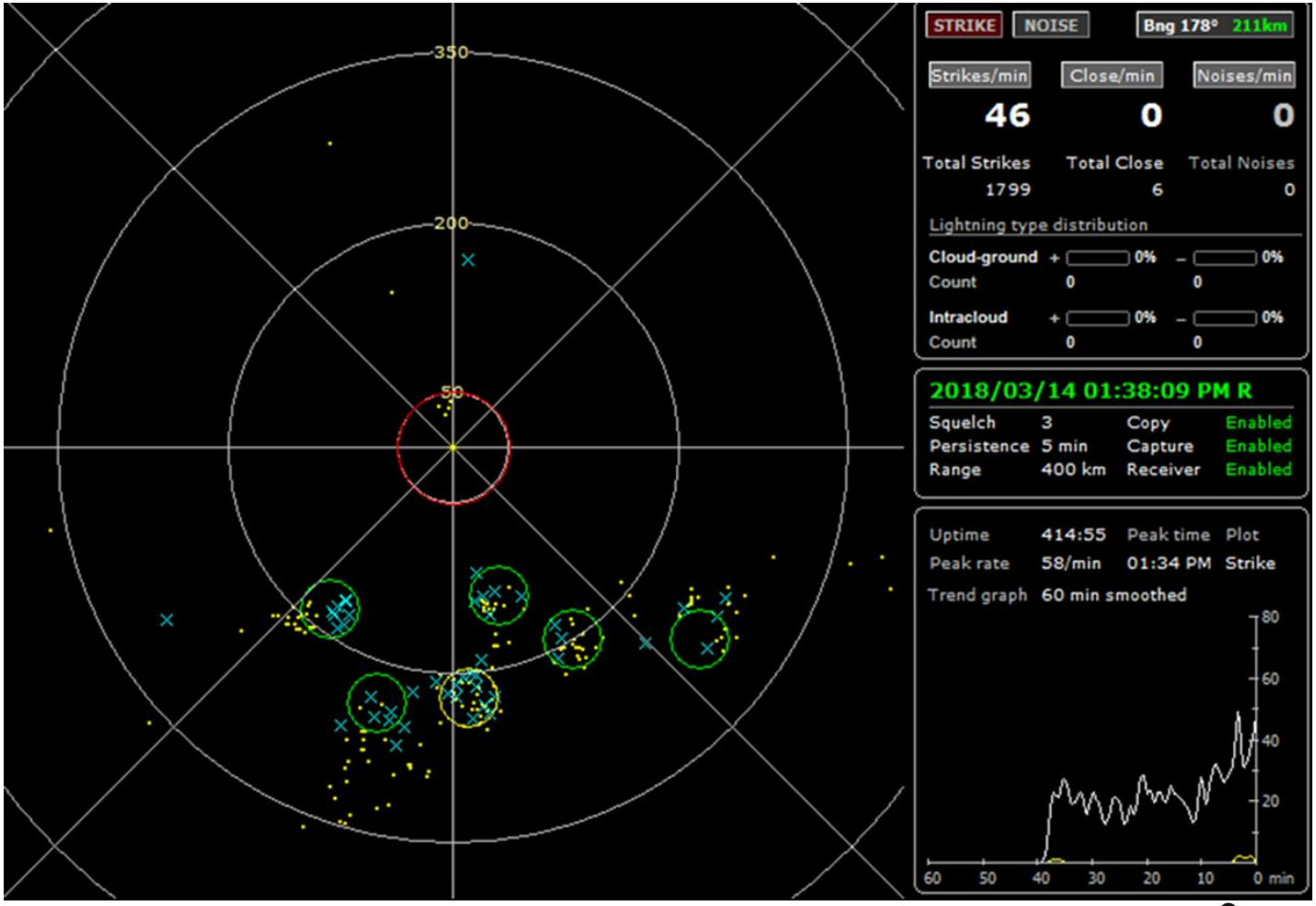
# The result




Real time strike

Previous strike

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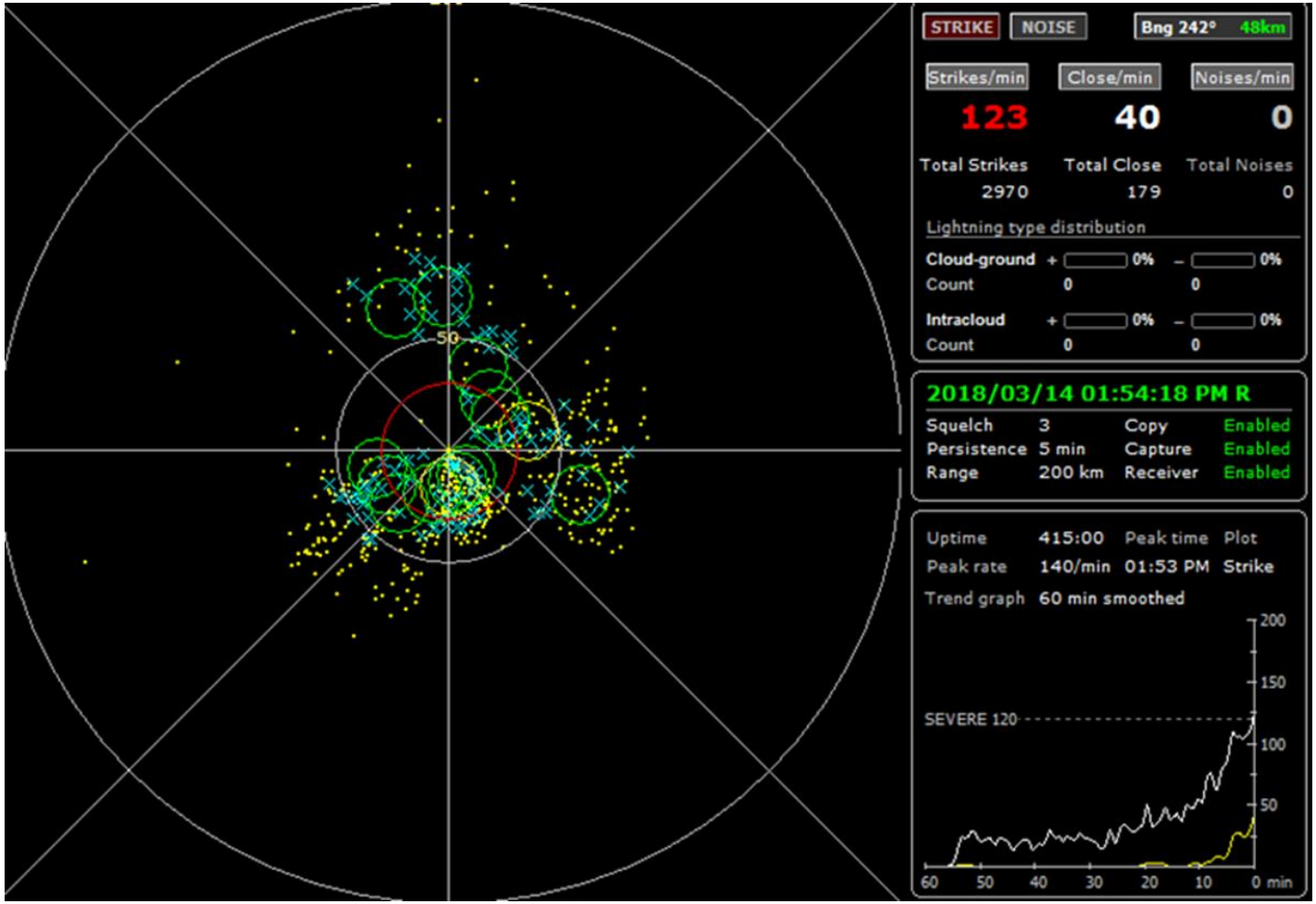
# The result

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# Uses

- Pre-warning for site to manage;
  - Employees working at heights
  - Employees working outside
  - Tank farm areas
  - Incident management

# Management

- Clear policy required to ensure effective use of the system. Policy should provide a guideline on when to inform who about what. Not only warn of approaching storm but also once the storm has subsided to allow for normal activities to continue.