



A BUYING GUIDE FOR  
SEVERE WEATHER

# Lightning Alerting Systems

# Contents

<b>Introduction</b>	...	<b>03</b>
<b>Technology Differences</b>	...	<b>04</b>
Lightning Alert Technology: Prediction vs. Detection	...	<b>04</b>
Lightning Detection Reliability: Single-Node vs. Network-Based Coverage	...	<b>05</b>
<b>Key Features of Lightning Alerting Systems</b>	...	<b>06</b>
Storm-Tracking Visualization	...	<b>06</b>
Real-Time Alert Delivery	...	<b>07</b>
All-Clear Countdown Clock	...	<b>08</b>
<b>Lightning Alerting Systems Summary</b>	...	<b>09</b>

# Introduction

Inclement weather can derail operations at any outdoor venue in the blink of an eye.

Although preparation can mitigate safety risks from thunderstorms, blizzards, or heatwaves, weather patterns evolve by the second. That means from the moment a forecast is broadcast, it becomes old news. And with an average of about 100,000 thunderstorms a year in the U.S. alone, according to the National Oceanic and Atmospheric Administration, that's simply too much uncertainty to ignore – especially when your patrons are at the mercy of the elements.

Parks, sports complexes, schools, and local governments need better strategies for detecting weather phenomena and monitoring it in real time. All must make intelligent decisions efficiently, then quickly disseminate information to staff and visitors in a manner that protects both people from harm and equipment from damage. The problem is, there are solutions available on the market today that claim to help you reach those goals, but they don't all perform as advertised.

Why is that? Well, there are **two major areas** that differ from system to system:

1. **Data used to power the solution**
2. **Method of data delivery used by the solution**

In this buying guide, we'll explore some of the most important aspects of a strong outdoor alerting system. Specifically, we'll compare technology differences like:



Lightning prediction

vs.



Lightning detection



Single-node lightning detection

vs.



Network detection

We also compare other key features that set superior systems apart from the others, like:

- Storm-tracking visualization
- Real-time alert delivery
- All-clear countdown clocks

# Technological Differences

When it comes to the science of meteorology, data is key.

A lot of people don't realize that free weather apps are free for a reason: the **quality of data simply isn't the same** as it is in comprehensive weather intelligence solutions. This section of the buying guide dissects the differences between two key technology features of the leading outdoor systems in the marketplace today.

## 1 LIGHTNING ALERT TECHNOLOGY: PREDICTION VS. DETECTION

Lightning data is a critical piece of information that most outdoor alerting systems use to send out alerts. Total lightning, which includes both cloud-to-ground and in-cloud lightning, is the most accurate and comprehensive intelligence for weather alerts. Since lightning data is so important, let's take a look at the key differences in lightning safety solutions like horns and strobes available today. **First, let's look at the differences between prediction technology and detection technology.**



### PREDICTION TECHNOLOGY

- ✘ Electrostatic lightning prediction systems **predict the possibility of a lightning storm** based on atmospheric conditions.
- ✘ Prediction technology **identifies electrostatic discharges only** but can't discern the direction they came from nor their range with any certainty.
- ✘ Limited measurements with more reliance on prediction **can trigger false alarms**. To prevent false alarms, equipment manufacturers or owners often set alert thresholds high which results in a greater potential for unreported storms.



### DETECTION TECHNOLOGY

- ✓ Industry-leading lightning detection systems track the motion of active thunderstorms and measure lightning-specific discharges **in real time, lowering false alarm rates**.
- ✓ The best lightning detection technology can pinpoint the **exact locations of storms** across the globe and help users analyze the threat potential to their immediate neighborhoods and other operating areas.
- ✓ Detection systems that can distinguish between cloud-to-ground and in-cloud lightning offer **accurate lead times** to provide ample planning to get people to safety.



## 2 LIGHTNING DETECTION RELIABILITY: SINGLE-NODE VS. NETWORK COVERAGE

Not only does the quality of your weather tracking and alerting system matter, but the reliability of the data matters as well. Systems backed by robust data networks provide a more complete picture of weather conditions, fast-moving storms, and potential hazards. **Let's discuss the key differences between single-node detection and network detection technology:**



### SINGLE-NODE DETECTION

- ✘ When single-node detection equipment is **the sole weather monitoring asset on site**, there is no redundancy available if that single sensor goes offline. No redundancy means no detection.
- ✘ Leading single-node detection equipment has a detection radius of only **about 20 miles**.
- ✘ Range accuracy of single-node systems is **generally poor** and can degrade even further if the sensor is not properly maintained.



### NETWORK-BASED DETECTION

- ✔ Network-based detection relies on **a network of lightning sensors**, so if the sensor at your particular location was offline for some reason, lightning detection service would still be fully operational.
- ✔ Networked lightning detection is not limited to the local vicinity. Depending on the coverage of the network, **it can span counties, states, and even countries**.
- ✔ Due to the high coverage of connected networks, the range accuracy of network based detection is **much higher**.



# Key features of a lightning alerting system

Even if you are using an outdoor alerting system with the highest-grade technology and visualization behind it, that's only half of the battle when it comes to preparing for severe weather. You need to have the right features that allow you to use the system seamlessly on a daily basis. Let's take a look at a few important features to look for when evaluating an outdoor alerting system.

## Storm-tracking visualization

Many outdoor alerting solutions also include a weather visualization tool to view weather conditions and monitor approaching storms. Many visualization products provide basic radar information that tracks high-level storms. Modern visualization tools enable severe weather intelligence, incorporating dozens of weather data points, lightning information, and the ability to set customized alerts.



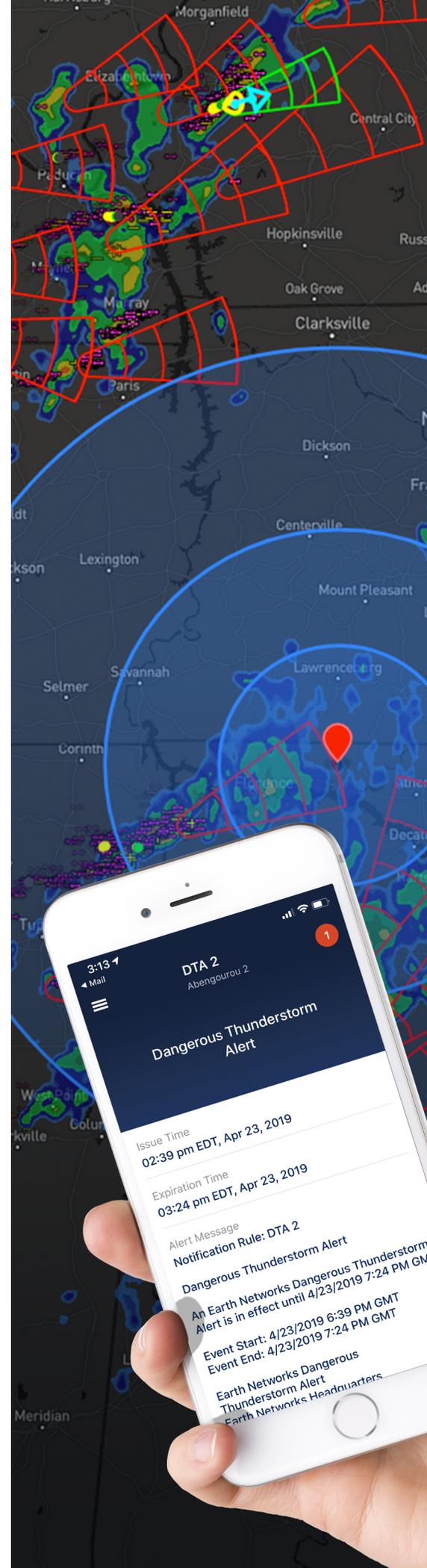
Next-generation visualization products update information in near real-time, allowing **up to the minute tracking of nearby storms.**



**An extensive library of visual layers** can be added to a map for a more customized and integrated analysis. For example, a user can see the intersection of weather information such as wind speed, lightning strikes, and rain rates.



**Customized alerts** can be configured for specific locations and specific weather elements. These alerts can then be delivered through various formats depending on user preference including email, text message, or mobile application push notifications.



## Real-time alert delivery

Data delivery in the form of severe weather and lightning alerts needs to be done quickly to give decisionmakers enough time to make the call, move visitors to safety, and protect equipment. When storms approach an outdoor venue, every second matters and minutes can be the difference between safety and injury. Automated, real-time alerting provides many benefits:



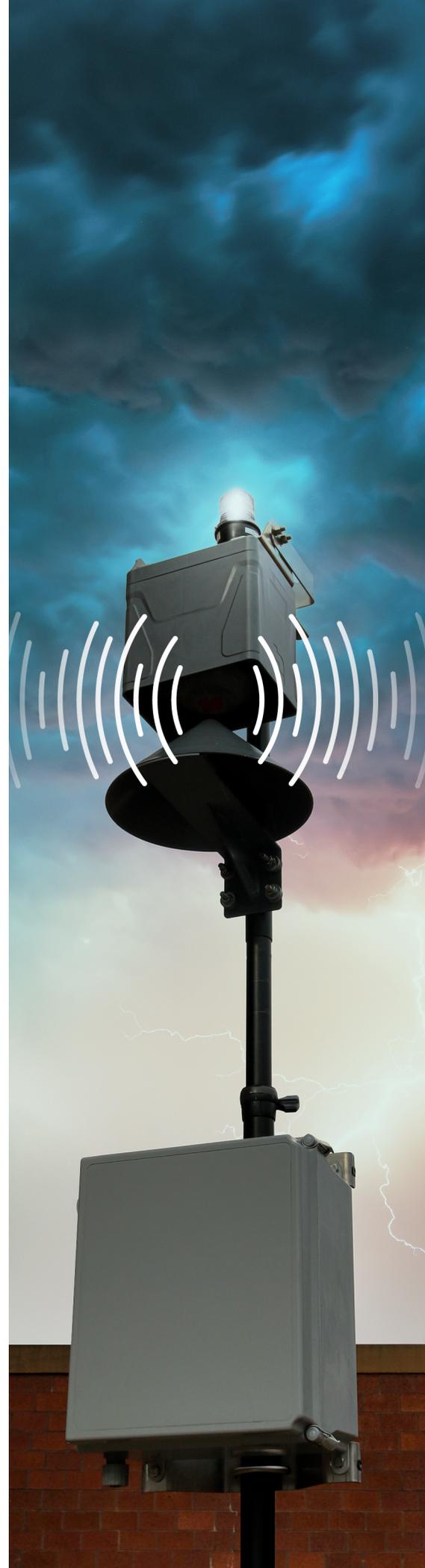
Lightning alerts are only as good as the data behind the system. **Minimize the risk of false or missed alarms and ensure timely delivery of alerts** with a solution backed by a high-density lightning network that has redundancy, reliability, efficiency, and location accuracy built in.



Allow the power of automation to help you make safer weather-related decisions with automated alerts and an all-clear countdown. Even if you aren't actively monitoring the weather, automated alerts will **proactively notify you and your staff when lightning threatens your operations**, minimizing delays in mobilizing teams and safety protocol.



Nobody argues with the siren. Real-time alerts delivered by audible sirens and visual strobes allow you to quickly and efficiently move staff and visitors to safety with a **clear understanding of why they are under alert and when it is safe to resume activities**.



## All-clear countdown clock

The latest systems provide a countdown clock, so people know the expected length of a delay after an alert has been issued. Some systems choose to use a color-coded system based on the distance of the lightning but this doesn't provide the expected time of the delay to the same granularity as a countdown clock does. In addition to the clock, another tool to clearly communicate when it is safe to resume business as usual is an all-clear horn blast. Together, these tools ensure everyone knows when the storm has moved a safe distance away. Some benefits of countdown clocks include:



You don't want to make guesses when it comes to severe weather and the safety of your visitors and employees. Countdown clocks **reduce decision-maker uncertainty** by providing a clear timeline that resets if new dangers arise.



What good is a countdown clock if no one can see it? Look for tools that **clearly communicate countdown times** with an easily accessible web-based countdown tool or on-alert enabled display at key locations. The digital countdown clock should be paired with an audible alert for more effective mass notification.



Did you know that most lightning strike accidents occur as a storm approaches and as it leaves? Many lightning strike injuries and deaths occur in these timelines when people assume it's safe either because the skies are blue or the storm seems to have passed. Countdown clocks that **update in real time offer greater protection** from lightning events like "bolts from the blue" and large storm systems that may appear to briefly clear up but still pose a risk.



# Lightning alerting systems summary

The best lightning alerting systems aim to automate safety decisions by leveraging best-in-class lightning detection technology.

These systems also rely on redundant networks to ensure systems are reliably working at any time, even if a local sensor is offline. The technology is only beneficial if it can be easily used to make and implement daily decisions. Market leading solutions incorporate the flexibility for users to configure the system for their specific needs, automatically communicate threats to their audience, and keep them informed on when it will be safe to resume their normal activities.

AEM's Sferic Siren lightning alerting system leverages all the optimal features included in this buying guide, along with a helpful team that makes the onboarding process simple. Interested in learning more about what separates our Sferic Siren lightning alerting system from other weather tracking and alerting systems? **Visit [www.aem.eco](http://www.aem.eco) or reach out to a representative today.**



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