THOR GUARD LIGHTNING PREDICTION & WARNING SYSTEMS

For: Sunshine Football Officials Association

Pinellas County Schools Thor Guard Website:http://pcsb.thormobile1.net

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THOR GUARD

Thor Guard is designed to detect and most importantly **PREDICT** lightning by measuring the static electricity in the atmosphere and monitoring how much energy is building and changing **BEFORE** lightning occurs. All other lightning systems or methods can only detect lightning and warn you <u>AFTER</u> lightning has struck nearby.

Lightning detection systems and their networks leave you vulnerable to late warning of first strikes and waiting 30 minutes after the last strike. *Since every thunderstorm is unique*, only a Thor Guard Lightning Prediction System can alert decision makers to danger before it occurs.
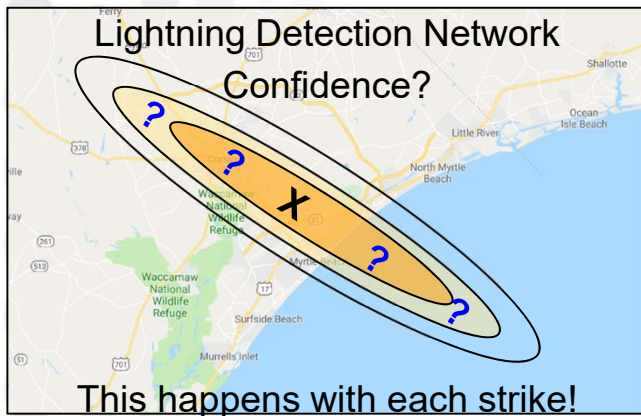
You can't control the lightning, but you can control how PROACTIVE you are when everyone's safety is in your hands. Don't be reactive like a detection system because…

**<u>EVERY THUNDERSTORM HAS A FIRST STRIKE!</u>**

DETECTION DANGERS

Lightning Detection Networks require multiple sensors reporting data as fast as possible to servers <u>not at your location</u> to triangulate the data, *re-sell the data* and then tell you where the lightning was AFTER it has already struck.

But the problems that cell phone networks have are very similar to the problems that lightning detection networks have. Dropping calls or showing you in the wrong location is a result of the connection having an issue or one of the towers not picking you up. In the case of detection networking, the confidence ellipse (left) that estimates the location of a lightning strike can become huge when the slightest issue occurs.

This means the network thinks that lightning struck in that area, but isn't 100% sure, so the center of that huge area is determined to be the location of the strike. What if it's wrong and the strike wasn't 1 mile away, but was really at one of the question marks 5 to 10 miles away or more?! Then you are stopping your outdoor activities based on a guess.
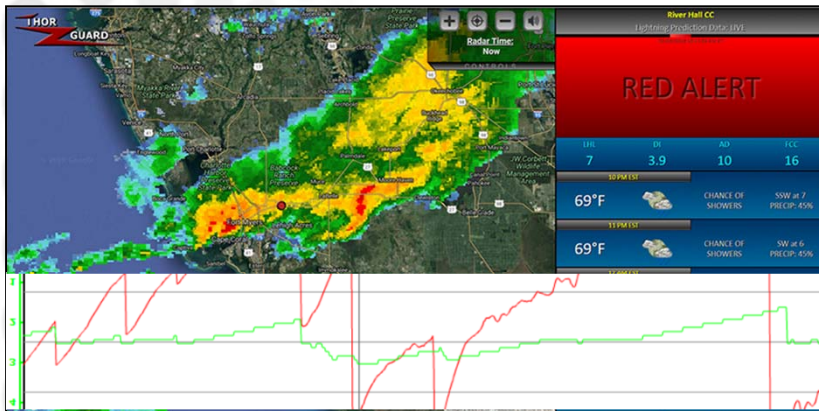
PREDICTION POSITIVES

Our Lightning Prediction Systems take out the guesswork by doing all of the millisecond calculations at each system's site. Then we display this extremely valuable information *only to you* in an easy to understand display increasing confidence for those making the decision to keep everyone safe.
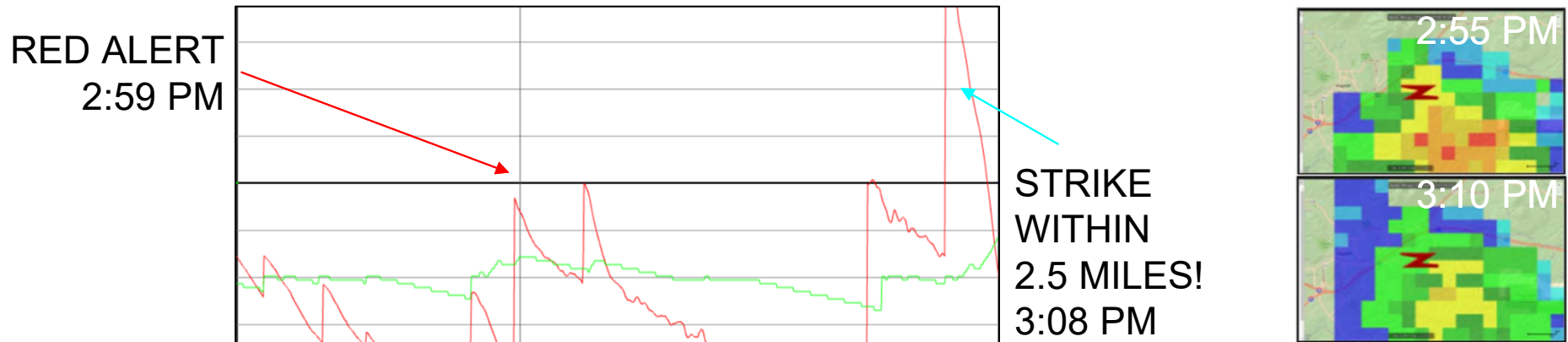
THOR GUARD

TYPICAL LIGHTNING SCENARIOS

	✅ Warning **BEFORE** Lightning Strikes Within 2.5 Miles Of Your Area	❌ Warning **AFTER** Lightning Strikes Within 2.5 Miles Of Your Area	Thor Guard Lightning Prediction System	Lightning Detection System	30/30 Rule
Large Area of Storms 10 miles Away Obviously Aiming for My Site…..			✅	✅	✅
First Storm Pops Up 10 miles Away and is Aiming for My Site…….....			✅	✅	✅
First Storm Pops Up 6 miles Away and is Aiming for My Site……..........			✅	✅	✅
First Storm Pops Up 2 miles Away and is Aiming for My Site…………...			✅	❌	❌
First Storm Pops Up at My Site………………………….... ...………......			✅	❌	❌
Storms 10+ Miles Away Create a Bolt Out of the Blue Strike Onsite….			✅	❌	❌
Large Area of Rain with Random Lightning every 30 Minutes……….....			✅	❌	❌

Thor Guard in **RED ALERT** <u>9 MINUTES BEFORE</u> first and only strike!

RED ALERT
2:59 PM

STRIKE
WITHIN
2.5 MILES!
3:08 PM

2:55 PM

3:10 PM

In the example above, the red line represents the energy the Thor Guard measures.
At 2:59 PM, the Thor Guard system in Arizona went into **RED ALERT**.
As you can tell on the radar imagery at 2:55 PM, the 'shower' was stronger than it
was by 3:10 PM. However at 3:08 PM, the *first and only strike* heard by Thor Guard
personnel in this area occurred. This means that not only can a Thor Guard detect
lightning, but more importantly **PREDICT** lightning <u>9 MINUTES BEFORE</u>
it happened. Any other lightning warning system would have simply warned you a
few moments after that lightning strike discharged very close by!

Thor Guard in **RED ALERT** <u>29 MINUTES BEFORE</u> strikes within 5 miles!

RED ALERT
2:27 PM

STRIKES
WITHIN
2.5 MILES!
2:56 PM

2:30 PM

3:00 PM
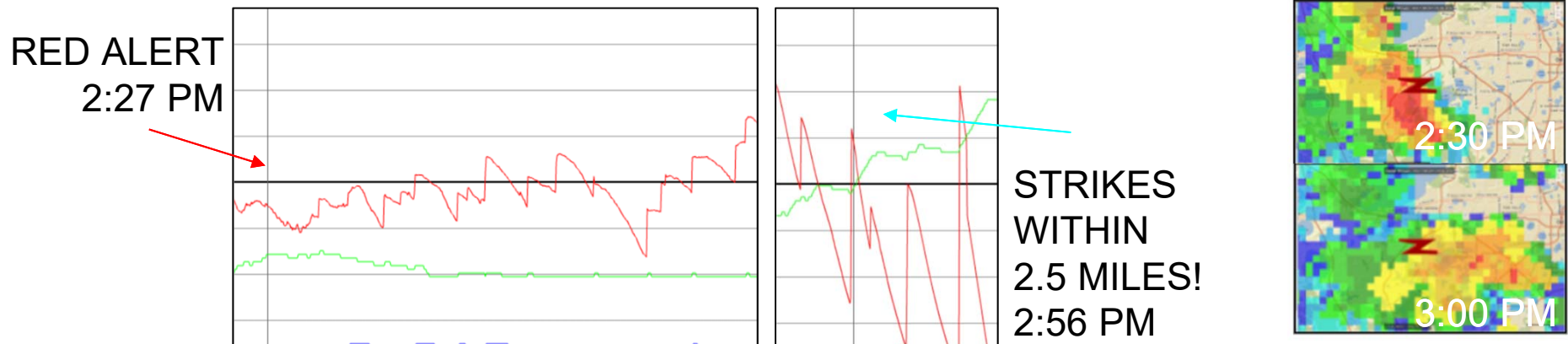
In the example above, the red line represents the energy the Thor Guard measures. At 2:27 PM, the Thor Guard system at this location in Florida went into **RED ALERT**. Although the radar imagery at 2:30 PM shows the heaviest part of the storm near the Thor Guard's location, it was simply a heavy downpour with very distant rumbles. Then as it got closer to 3:00 PM the center of the storm moved farther away, but the lightning actually got closer since it was trailing behind. By 2:56 PM lightning began to get very close to this location again showing the Thor Guard's ability to detect and **PREDICT** the threat of lightning - in this case giving <u>29 MINUTES</u> warning time.
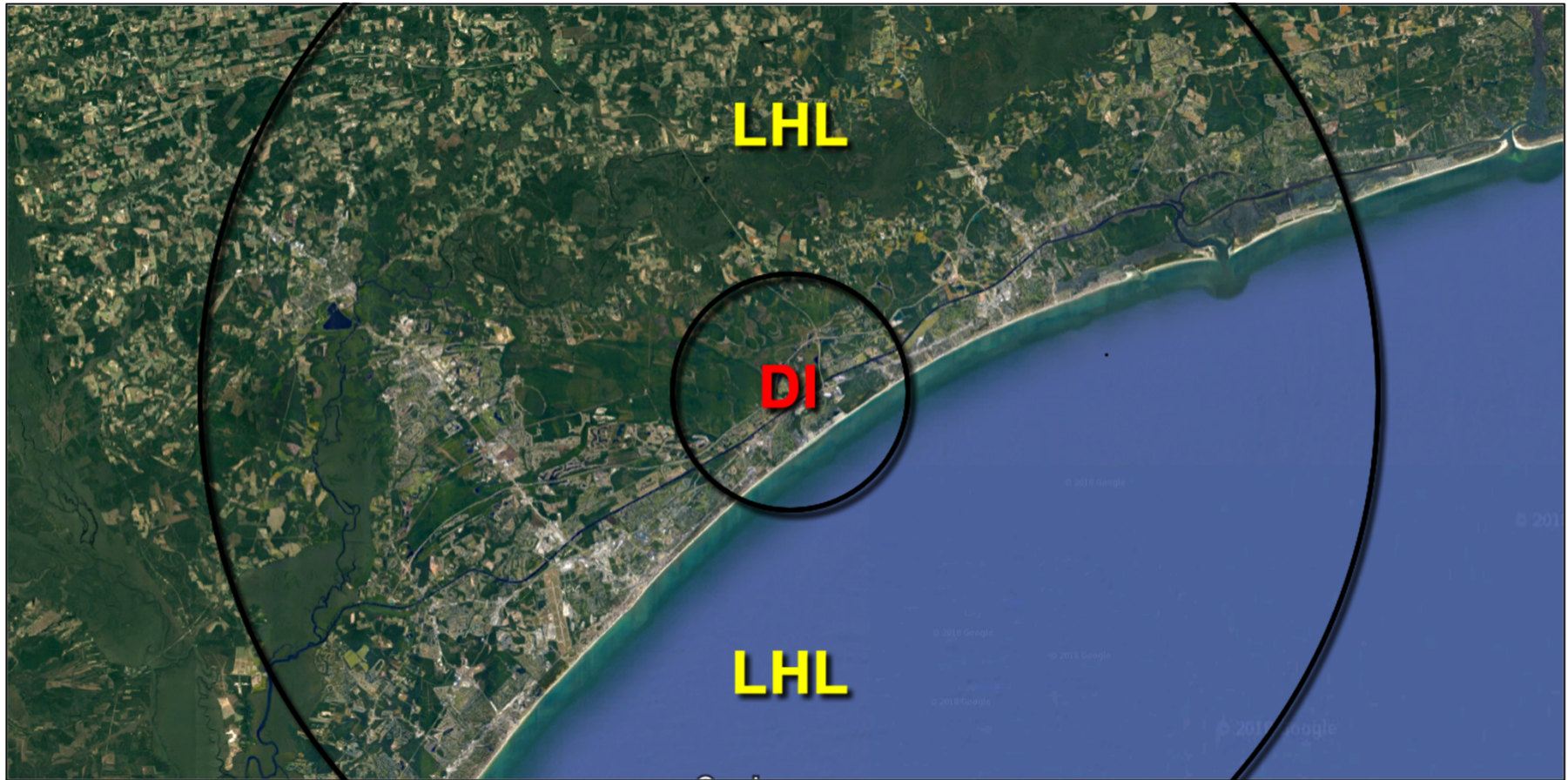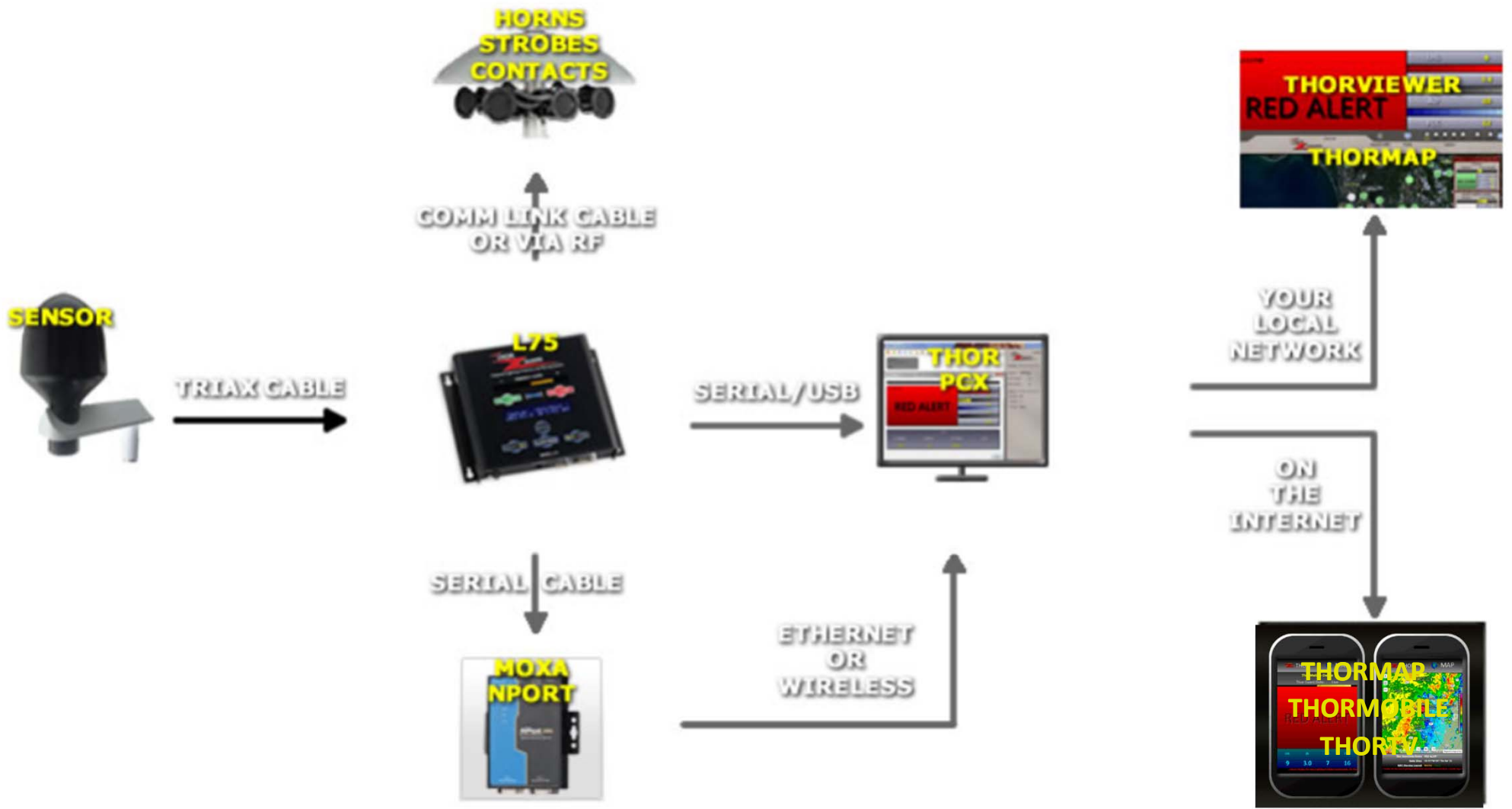
Even though our systems can detect lightning out to 20+ miles, for your facility we could set our lightning prediction outer range (LHL) to 10, 12 or 15 miles and warn you when the inner range (DI) sees enough energy changing within 2 to 2.5 miles to predict the threat of lightning.
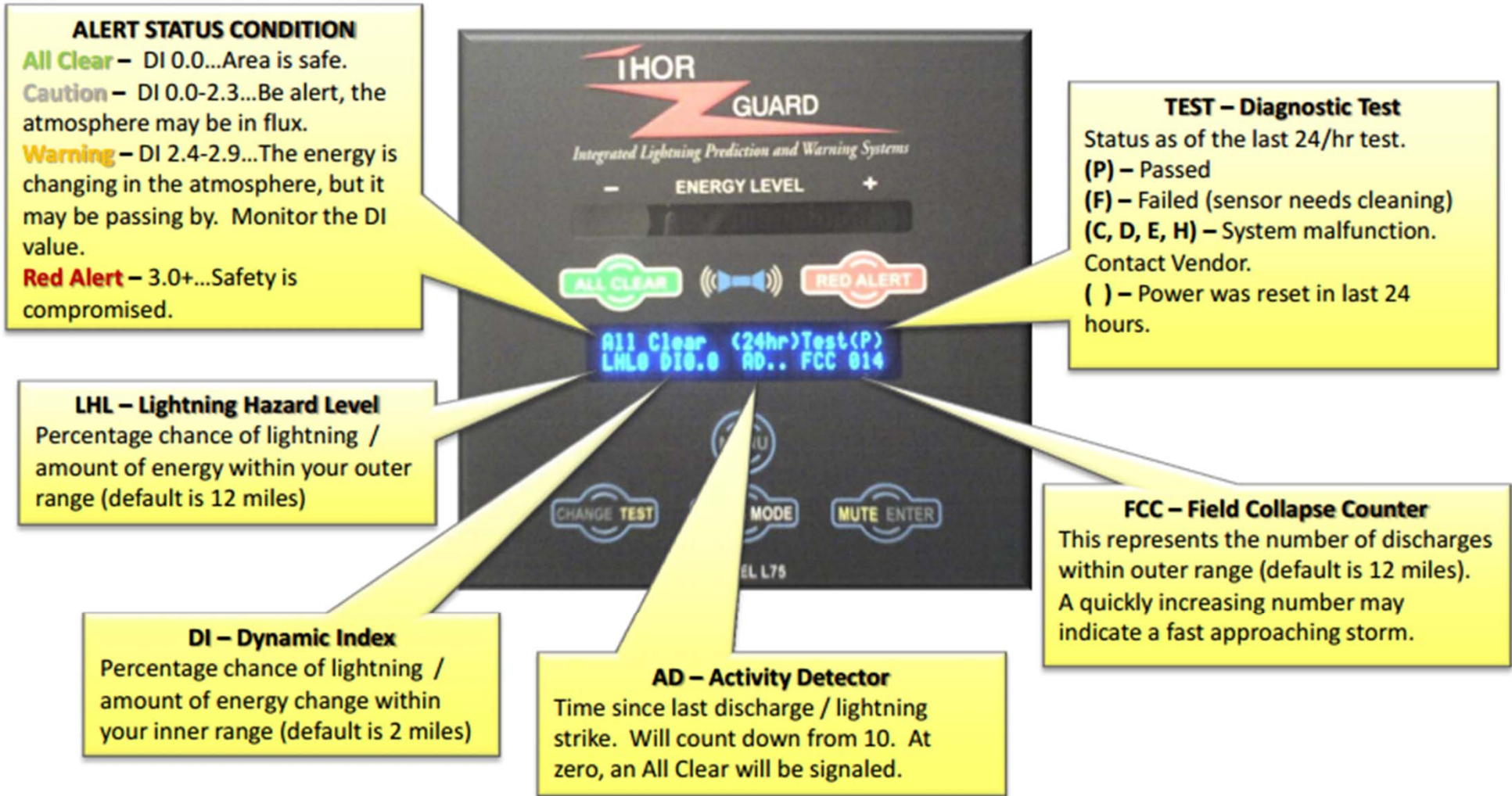
http://www.thorguard.com/customer/

THOR Z GUARD

ALERT STATUS CONDITION
All Clear – DI 0.0...Area is safe.
Caution – DI 0.0-2.3...Be alert, the atmosphere may be in flux.
Warning – DI 2.4-2.9...The energy is changing in the atmosphere, but it may be passing by. Monitor the DI value.
Red Alert – 3.0+...Safety is compromised.

TEST – Diagnostic Test
Status as of the last 24/hr test.
(P) – Passed
(F) – Failed (sensor needs cleaning)
(C, D, E, H) – System malfunction. Contact Vendor.
( ) – Power was reset in last 24 hours.

LHL – Lightning Hazard Level
Percentage chance of lightning / amount of energy within your outer range (default is 12 miles)

FCC – Field Collapse Counter
This represents the number of discharges within outer range (default is 12 miles). A quickly increasing number may indicate a fast approaching storm.

DI – Dynamic Index
Percentage chance of lightning / amount of energy change within your inner range (default is 2 miles)

AD – Activity Detector
Time since last discharge / lightning strike. Will count down from 10. At zero, an All Clear will be signaled.

Display: All Clear (24hr)Test(P) / LHL0 DI0.0 AD.. FCC 014

THOR Z GUARD
Integrated Lightning Prediction and Warning Systems
– ENERGY LEVEL +
ALL CLEAR ((•))•)) RED ALERT
CHANGE TEST MODE MUTE ENTER
EL L75

ThorPCX is software that installs on a Windows-based PC or Server. It is the core software that handles all THOR GUARD data. **ThorPCX** receives incoming data from your THOR GUARD system usually via a directly connected Serial/USB cable. **ThorPCX** can automatically archive storm data files for later review, send automatic email and text alerts, uploads your data to your ThorMobile/ThorTV/ThorMap website to provide all of your THOR GUARD Sensor data to any of our many software display products.
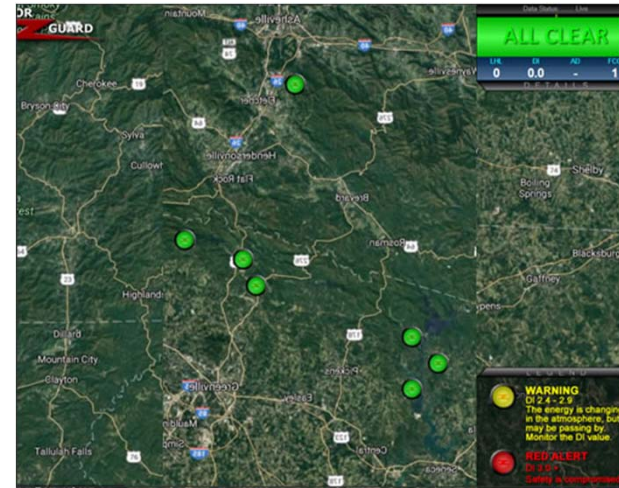

http://www.thorguard.com/customer/

SOFTWARE DISPLAYS

THORMOBILE

THORMAP

THORTV

http://www.thorguard.com/software/