



Guardian

The most effective and affordable road weather information system for cities, towns and counties



What will you do with your Vaisala Guardian?

- Make better decisions based on real-time road surface conditions
- Realize substantial savings in road maintenance costs
- Increase operational efficiency and response effectiveness
- Improve road safety
- Enjoy using a convenient, centrally managed solution
- All of the above





Always have the answer

Managing a winter road maintenance program is harder than ever. Budgets are tight and expectations are high. Warmer conditions have made more moisture available to heavy snow events and experts say we can expect them regularly. Seasonal variability leaves road maintenance authorities either over prepared or short on resources and there is increasing pressure to minimize the environmental impact of salt and other chemical applications on roadways.

In a tough job that demands long hours of focus in the worst kinds of weather, you want to eliminate guesswork and imprecise predictions. Truly effective operations demand the informed decision making that only meaningful real-time data can provide.

The Vaisala Guardian is a non-invasive Road Weather Information System (RWIS) that cost-effectively provides you with the most accurate pavement specific weather information available.

Removing uncertainty, the Guardian enables you to remotely monitor road conditions in real-time with unprecedented levels of precision. It also provides the valuable observed road weather data that is proven to make forecasting far more accurate and reliable.



THE CLEAR CHOICE FOR CITIES, TOWNS AND COUNTIES:

Featuring simple "do it yourself" installation, ease of use and virtually maintenance-free operation, the Guardian is a proven RWIS solution that is available at a fraction of the cost of an in-pavement sensor system.





VAISALA

The most trusted name in Road Weather Information Systems

Exceeding expectations for almost eight decades, Vaisala is the world's largest manufacturer of weather measurement devices. Serving over 100 countries, we supply more than 40% of the road weather information systems and services used around the globe today.

Time-tested quality and unmatched expertise have made Vaisala a world leader in our core fields and the number one partner in mission critical measurement processes. Our instruments provide optimal measurements so that your decision-making tools are exactly what they need to be - flawless and accurate.

Advanced instruments. Turnkey solutions. Industry-leading installation and support services. At Vaisala, we do more than just develop world-class products. We build sustainable advantages.

The true specialist in road weather measurement

Vaisala revolutionized the measurement of road surfaces and no other provider comes close to our level of expertise, R&D and quality assurance.

Vaisala is the only company that manufactures all the sensors and remote processing electronics in its road weather systems. With expertise in each RWIS component, we provide complete solutions that ensure smooth integration and the highest levels of compatibility with your existing technologies.





Committed to delivering leading edge technology, Vaisala invests approximately \$30 million annually in research and development and operates the best R&D program, facilities and resources in the industry. Always ready to meet your unique requirements, Vaisala continues to improve its capabilities, technology and flexible services at a pace that is simply beyond the reach of our competitors.

Selected wherever quality counts

Customers who use Guardian benefit from the quality and expertise that has made Vaisala the world leader in our core fields across the industries of meteorology, traffic, aviation, environmental sciences and manufacturing. They also experience the consistently accurate measurement and dependability of a customer-driven company that keeps its promises.

CLIENTS WHO HAVE CHOSEN VAISALA SYSTEMS AND SERVICES INCLUDE:

- National Aeronautics and Space Administration (NASA)
- State and local road authorities in Maine, Vermont, Michigan, Tennessee, Virginia, Georgia, Nebraska, Colorado, Wyoming, Idaho, Nevada, California, Washington, Ontario and British Columbia – among others
- The National Weather Service (NWS)
- The Federal Aviation Administration (FAA)
- The World Meteorological Organization (WMO)
- The United States Defense Forces
- Meteorological Service of Canada
- Most of the world's international airports



One of the many attractions of the Guardian is the unique ability of its sensors to report on road friction or grip. Grip is an excellent metric to gauge the safety of roads and proactively determine the need for – and effectiveness of – your winter maintenance actions.

The advantages of a superior non-invasive sensor system

Cities, towns and counties across North America are choosing the Guardian over in-pavement sensor systems. Unlike invasive systems that are embedded into roadways, the Guardian employs state-of-the-art sensors that are easily mounted above or beside roadways. Other advantages of the Guardian include:

Affordability: Before Vaisala introduced the Guardian, municipalities had to permanently implant puck-like sensors into the roadway to benefit from pavement specific weather information. Making RWIS accessible and affordable, the Guardian is available for about a third of the cost of installing a single in-pavement RWIS site.

Accurate data: Employing state-of-the-art technology and laser spectroscopy, the Guardian's sensors exceed the accuracy of in-pavement sensors and measure a larger surface area. While independently detecting water, frost, snow, slush and black ice, the Guardian accurately measures the road surface state and provides a variety of data – including the level of grip offered by pavement.

Ease of installation and relocation: In an easy “do it yourself” procedure, the Guardian can be quickly strapped onto existing structures, such as lighting poles, traffic signals and buildings. Once mounted, you just hook up power, hit a switch and start transmitting data. Conversely, authorities installing an embedded sensor system have to saw cut into pavement, close roads and bridges, reroute traffic and abandon expensive sensors when repositioning systems or resurfacing roads.

Convenience and simplicity: Accessible around the clock from anywhere via an intuitive Web display, Guardian data is presented in a meaningful way that allows you to quickly make well-informed decisions.

Virtually maintenance-free operation: Say goodbye to pricey maintenance contracts, outsourced repair technician rates, service trip costs and costly downtime. While reliability problems and expensive upkeep may be major issues with embedded sensors, the Guardian is virtually maintenance-free. The Guardian requires only periodic cleaning of its sensor lenses and will automatically inform you when the lenses are dirty.

Reliable support: The Guardian includes free 24/7 helpdesk support in winter months to answer any questions you might have. Vaisala also employs an internal team of experienced technicians and our service expertise is so valued that we are often hired to maintain the products of other manufacturers.

Expandability: The Guardian can be augmented with a full range of atmospheric sensors to measure visibility, the type and intensity of precipitation, barometric pressure, wind speed, wind direction and solar radiation. It can also be used for forecasting, thermal mapping services and more.





Better than actually being there

The Guardian enables you to instantly assess the conditions at your road site. The amount of accumulated water, frost, ice, slush and snow. Real-time measurements of grip. The temperature of air and pavement. The effectiveness of winter maintenance efforts and the level of traction and safety offered by roadways and sidewalks.

Capable of detecting the first ice crystals that develop on a road, the Guardian can provide you with significant lead time before conditions become slippery. It also relays frost and snow information to help you gauge when it is time to plow or treat roads to ensure good traction and prevent accidents. Visual confirmation of all measured conditions and levels of traffic is provided by the Guardian's camera.

Stay informed of alarming road conditions

Set the Guardian system to automatically send alerts to your PC, cell phone, PDA or pager to notify you when road conditions reach your configured thresholds. Have your sensors trigger variable message signs that warn motorists of hazardous road conditions or control the timing of lights at intersections to better manage traffic in deteriorating weather. Access Guardian's traffic camera and always have an eye on the road when it matters most.

The Guardian promotes operational efficiencies that reduce winter maintenance operating costs on aspects such as salt, sand, pre-wetting and de-icing chemicals, fuel, overtime and equipment upkeep.



The elements of success

Sensors: Housed in rugged weather shielding and designed for harsh and varying climates, the Guardian includes two independent non-invasive surface state and temperature sensors that utilize the latest in optical technology. Unaffected by fog and falling snow, these sensors also feature an algorithm that filters out traffic to further ensure continuous and accurate measurement.

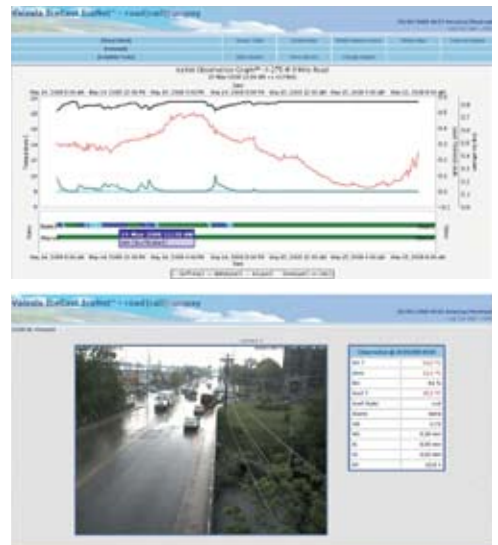
Camera: The Guardian's durable, low light camera provides high-quality color images of road and traffic conditions during daytime and throughout the night in lit areas.

Remote Processing Unit (RPU): Housed within a stainless steel, weather-proof cabinet, the Guardian's state-of-the-art RPU delivers optimal power and communication. It has a solar power option, accommodates additional sensor capability and comes configured with a cellular modem.

Display & data management: The Guardian includes collection and management of data as well as access to an intuitive, password-protected Web display that shows road surface status data in meaningful formats. Requiring no additional software to use, Guardian saves you the costs of owning and running your own servers.

Support services: Vaisala offers the industry's best customer service, including a 24/7 free phone helpdesk during winter months and data archiving services. Our support service expertise is so valued that we are often hired to maintain the products of other manufacturers.

Guardian Web Display: Sensor & Camera



Support Services



Guardian benefits:

Operational

- Improved decision-making through real-time information
- Measures grip: an excellent metric to gauge the success of - and need for - winter maintenance actions
- Provides significant lead time before maintenance actions become necessary
- Facilitates improved road safety and accident prevention (injury, damage to property and loss of life)
- Eliminates guesswork and promotes the effective allocation of resources
- Ready for immediate use (minimal training required)
- Quick “do it yourself” installation and relocation: easily attached to lighting poles, traffic signals or buildings
- Virtually maintenance free
- Year-round applications
- Improves the accuracy of forecasting
- Risk mitigation (accurate data and historical records reduce exposure to litigation)
- Convenient, centrally managed solution

Financial

- Promotes significant annual savings in equipment maintenance, road treatment materials, labor and fuel
- Cost effective: excellent value and ROI for the fraction of the price of embedded sensor systems
- Saves you the cost of purchasing and operating a server and managing data

Informational

- Immediate access to meaningful real-time data that is easy to understand
- Access highly accurate data 24/7 from anywhere with an Internet connection
- Automated alerts by PC, cell phone, PDA or pager when detected conditions meet thresholds that you set
- Includes data collection and data management at no extra cost
- Option to access shared information with neighboring authorities for an increased scope of information

Environmental

- Environmentally friendly: reduces use of fuel and anti-icing agents
- Promotes reduced contamination of soils, vegetation, water, highway facilities and vehicles
- Helps to minimize the corrosion of pavement, bridges and infrastructures caused by road salt

System

- Expandable: full range of atmospheric sensors available
- NTCIP option

Support

- 24/7 helpdesk support in winter months
- Data management, display and archiving responsibilities are managed by dedicated experts
- You benefit from decades of experience in RWIS and unsurpassed levels of reliability and expertise
- Vaisala is the only company that manufactures all the sensors and RPU electronics on its road weather stations

We make your success easy

Delivering exceptional value and precision, the Guardian provides pavement specific, real-time weather information and historical data in a meaningful and instantly accessible way. Affordable, accurate and easy to use, it promotes significant cost savings, improves the accuracy of forecasting and empowers strategic, proactive and preventative winter maintenance actions.

The Guardian is ready to go “right out of the box” and requires minimal training. The result is a headache-free, convenient and dependable solution that immediately improves operational efficiency with no negative impact.

**Remove uncertainty. Save money and resources.
Make better decisions.**

www.vaisala.com/guardian

Experience the Guardian edge today.





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