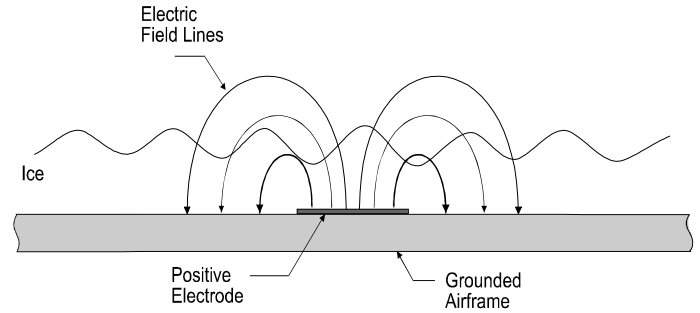




IceCap

Electronic Surface Contamination Sensor



Features

- Miniaturized ice detector.
- Reliable surface sensing of ice, snow, wet, damp, and dry.
- Remote ice thickness and temperature information.
- Easy integration with existing telematic or data logging systems.
- Low power, or solar available.
- Wireless reporting
- Low cost.

Overview

IceCap™ is a surface mounted electronic sensor that reports the surface condition of roadways, pedestrian walkways and equipment. This system detects traction hazards including ice, snow, or water in real-time. It can also be configured to provide road surface friction information.

The IceCap utilizes E-Field technology advancements to increase reliability and decrease overall system cost. The system consists of an emitter and sensor arrays that perform the active capacitance measurements, the measurement circuitry, a microcontroller and transceiver, all of which will be on a single board that can be mounted conveniently on the surface in question. Sensor size can be selected to give desired range of ice sensitivity.

The flexible data stream can be integrated with existing telematic systems for easy data transfer, sent to a hand-held or laptop device for real-time monitoring.

Operation

The electronic signature of the surface is used by the IceCap™ to determine surface condition. The resulting data is analyzed and reported in real-time. Ice and water condition, ice thickness, and outside air temperature is provided.

Specifications (preliminary)

Dimensions:
 USB unit: 4.25" x 3" x 1.5"
 Sensor unit: 3" x 4.5" x 0.1" (large)
 0.6" x 1" x 0.1" (small)

Weight:
 USB unit: 4.5 oz.
 Sensor unit: 2 oz. (large)
 0.4 oz. (small)

Power Input: 5 VDC (from USB)
 Current draw: USB unit: <100 mA
 Sensor unit: 0.7 mA

Oper. Temp.: -40°C to 125°C (257°F)
 Ice Sensitivity: 0.020" - 0.4" (large)
 0.004" - 0.1" (small)

Noise reject: 50/60 Hz
 Temp. sensor: Resolution: 0.1°C
 Accuracy: ±2°C

Applications

- Road Weather Monitoring
- Surface Friction Measurement
- Walkway safety
- Equipment Ice Load
- Automatic De-Ice
- Time to Melt Predictive Technology

Output

- USB, Ethernet (future), WiFi (future)
- Refresh rate: 16 Hz
- Ice thickness
- Surface Condition: Ice/Snow/Wet/Damp/Dry
- Friction Factor (0.1 – 1.0)
- Diagnostics: Power-on self test, internal voltage and temperature monitoring.

