HailSens IoT

Hail Monitoring System

Meteorology

General Description

HailSens IoT is an **advanced sensor for monitoring hail events in real-time**. The detection of hail impacts (as opposed to other types of icy or watery precipitation) relies on kinetic impact measurement. The characteristics of each detected hailstone (kinetic energy, equivalent diameter and timestamp of the impact) are both recorded and forwarded in real-time. Software at the receiver side can proceed to **immediate assessment of a hail event** while it is unfolding, and, subsequently, can be programmed to **issue near real-time alerts** based on the incoming data.

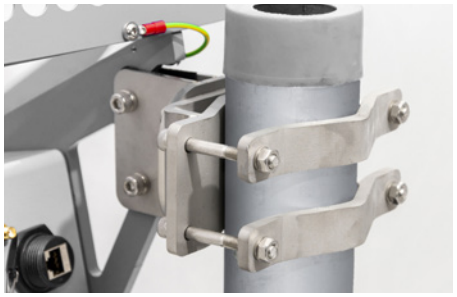
HailSens IoT revolutionizes the technology for sensing hail: It combines sophisticated measuring technology with online access to data. Its **unmatched level of detail per hailstone** makes the data extremely useful to every professional looking for objective comprehensive hail data. Whether you are a meteorologist or atmospheric physicist, a (re-)insurance claims adjuster, or the operator of a utility scale solar power plant: HailSens provides **objective and fast insights into the in-situ impact of hail events**. The data can be used to optimize prediction models, calculate or control parametric insurance indices, tilt solar panels into upright position, etc.

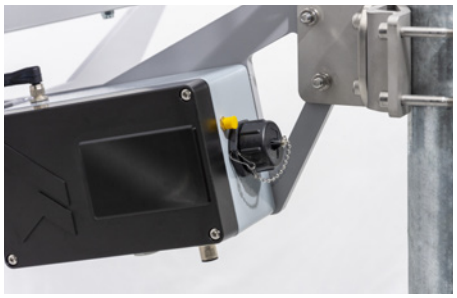
Applications

- Weather Services and meteorological offices
- (Re-)Insurance Companies
- Utility Scale Solarfarms
- Windfarms
- Agriculture / Farming
- Science and Research

Features

- Drift-free ratiometric in-situ kinetic energy and hail diameter sensors with life-time calibration and long-term stability
- Large sensing area of approximately 0.2 m² / 2.15 ft² (diameter 50 cm / 19.7 in) provides statistically relevant results for any given hail event (considering the relatively large distance between neighbouring hailstones)
- Choice of Ethernet or wireless IP communication
- Easy installation by one person on 2” to 4” vertical or horizontal pipe.
- Straightforward integration into existing IT infrastructure via Ethernet port





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Technical Specifications

Accuracy	Kinetic energy and pellet equivalent diameter: +/- 10 % (according specific mass density on ice and spheric model)
Operating and Measuring Ranges	– Deployment operating and storage temperature: -40 °F to +158 °F (-40 °C to +70 °C) – Calibrated measuring range: 32 °F to 158 °F (0 °C to +70 °C) – Humidity: 0 – 100 % RH
Electrical Specs	– Voltage range: 10V – 18V (DC) – Power consumption: typical 60 mA@12V (0.7 W), wireless comms engaged max. 120 mA@12V (1.4 W)
IP Grade	IP 66
Hail Measurement Range	– Measured data: kinetic energy: 0,01 to 28 J; derived data: pellet diameter 0.2 to 1.97 inch (5 to 50 mm) – Lower detection level: >=5 mm / >=0.20” (hail pellets according to WMO)
Data Transmission	– Wireless: IP data modem, antenna SMA connector – Wired: Ethernet RJ45
Data Exchange Interface/M2M	JSON to defined RESTful web service
Data Content	JSON: timestamp, kinetic energy, equivalent diameter
Datagram Frequency	– No hail: heartbeat every 6h – Hail event: near real-time during hail events: one dataset/pellet impact
Calibration and Drift	Lifetime calibration and drift-free differential measurement by in-situ ratiometric principle and compensation
Dimensions and Weight	– Sensor plate (round): Ø 19.685 in (500 mm), height: 11.81 in (300 mm), weight: 14.33 lbs (6.5 kg) – Mounting: 2” to 4” pole

Add ons

datasphere

datasphere is an online data management system. Special functionalities are available to store, manage and visualize hail data. Classification schemes based on either size or kinetic energy or even damage potential are available and can be adapted to user needs. Data download for further processing by the user is also available. Finally, datasphere offers alarm settings. Please visit **datasphere.online** for details.

HailSens360

HailSens360 is an early warning hail monitoring system combining advanced hail sensing technology with sophisticated cloud-based software, providing solar O&M teams streamlined access to localized, severe weather data insights. HailSens360 synthesizes forecast data (18 hours ahead), nowcast data (60 – 90 minutes ahead with updates every 6 minutes) along with meticulous post event analysis detailing the full scope of the hail event. These crucial pre and post hail event insights provide invaluable decision support in high stakes/severe hail scenarios where knowledge is power, timing is everything and data drives decisions.

Please ask for details.

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