



Vaisala Ground Cast Sensor provides an easy and affordable way to get key road weather measurements from critical locations that have not been covered before. It measures road temperature and the amount of treatment materials with the same performance as Vaisala's industry leading road weather stations.

Improve situational awareness and quality of pavement forecasts

Because efficient winter maintenance decision-making requires understanding of current and future road conditions, Ground Cast Sensor not only reports high-quality local observations, but also enhanced point forecasts.

Pavement forecast quality can be enhanced specifically by using Ground Cast Sensor's reference-grade surface temperature and base temperature (-30 cm or -11.8 in) measurements.

Measure from locations not possible before

Infrastructure-free installation and wireless design of Ground Cast Sensor allow rapid deployment to virtually any location in your road network. It works as a stand-alone unit and does not require external powering or coupling with a road weather station. Ground Cast Sensor offers a cost-effective way to complement your current weather observation network with additional measurement locations.

3+ year lifetime without any maintenance needs

Ground Cast Sensor includes a patent-pending wear-with-road mechanism that ensures the sensor stays always leveled with the road surface. As a result, the

sensor does not need maintenance during its lifetime, unlike conventional embedded sensors that may need annual grinding in roads where studded winter tires are used. The completely sealed construction makes the sensor incredibly robust and helps to minimize the risk of water leakage.

All wireless, yet reference grade

Ground Cast Sensor provides the same reference-grade measurement quality as Vaisala road weather stations and sensors. This ensures all data from your road network is comparable and reliable.

Easy access to data

The information provided by Ground Cast Sensor is automatically available in Vaisala Wx Horizon or alternatively as an API for integration into other systems. In Wx Horizon, the data can be visualized in the same way as other Vaisala road weather station data. The system provides a map view to understand the overall road conditions, location-specific graphs, and forecasts to provide insight into future road conditions. Configurable alerting can be set up for situations when, for example, the surface temperature drops below freezing and conditions are becoming hazardous.

Features

- Reports observations with enhanced point forecasts
- Wireless and self-powered
- 3+ year battery lifetime
- Measures:
 - Temperature at 3 levels: surface, -6 cm, -30 cm (-2.4 in, -11.8 in)
 - Treatment material amount
 - Surface state (dry / not dry)
- Drilled to road, installation takes less than 30 minutes
- Can be installed to various lane locations, including wheel track
- Maintenance-free due to self-leveling cushion mechanism (patent-pending)
- Low power NB-IoT communication
- Data available through Vaisala Wx Horizon® or API

Technical data

Measurement performance

Surface temperature

Measurements	0, -6, and -30 cm (0, -2.4, and -11.8 in) (below surface)
Measurement range	-40 ... +70 °C (-40 ... +158 °F)
Measurement accuracy	±0.2 °C (±0.4 °F) at -40 ... +70 °C (-40 ... +158 °F)

Chemical amount

Supported de-icing chemicals	Sodium chloride (NaCl) Calcium chloride (CaCl ₂) Sodium acetate (NaOOC ₂ H ₃) Potassium formate (KOOCH) Magnesium chloride (MgCl)
Reporting unit	g/m ²

Surface dryness

Reported surface states	Dry, not dry ¹⁾
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¹⁾ Sensor measures if there are any contaminants on top of it, but it does not differentiate between water, ice, and snow, for example. Situations other than dry are reported as "not dry".

Operating environment

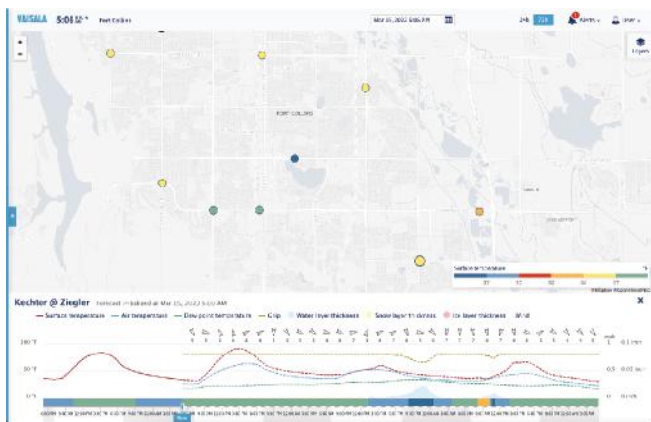
Operating temperature ¹⁾	-40 ... +70 °C (-40 ... +158 °F)
Storage temperature ²⁾	Recommended max. +30 °C (+86 °F)
Operating humidity	0 ... 100 %RH
IP rating	IPX8: Water immersion tested under the following conditions: <ul style="list-style-type: none"> • Immersion depth: 20 m (65 ft) • Immersion time: 140 hours

¹⁾ In extreme cold conditions where road temperature stays continuously below -20 °C (-4 °F) for multiple days, sensor battery operation might temporarily degrade.

²⁾ Recommendation from the battery manufacturer.

Communication and data collection

Communication standard	Narrowband IoT (NB-IoT)
SIM card type	Micro-SIM (3ff), provided by Vaisala
Local connection for sensor setup	NFC, disabled after installation
Software for sensor setup	Vaisala Android application
Data message interval	Every 10 minutes
Data storage location	Vaisala cloud
Data access options	Vaisala Wx Horizon® user interface Vaisala Wx Horizon® API Vaisala RoadDSS® user interface



Sensor data visualization in Vaisala Wx Horizon®

Mechanical specifications

Sensor

Dimensions (H × Ø)	353 × 56 mm (13.90 × 2.20 in)
Weight	640 g (1.4 lb)
Materials	Polyurethane (PUR)

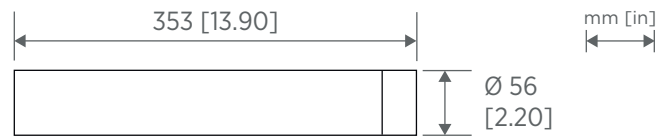
Battery

Type	Lithium-thionyl chloride
Lithium metal content	9 g per sensor, sensor includes 2 built-in, non-removable batteries (4.5 g / 0.010 lb each)

Installation

Recommended installation hole size	Ø 60 mm Depth: min. 360 mm (1417 in)
Requirements for surface material ¹⁾	Paved (asphalt, concrete)
Recommended installation sealants ²⁾	Fabick® MP-55

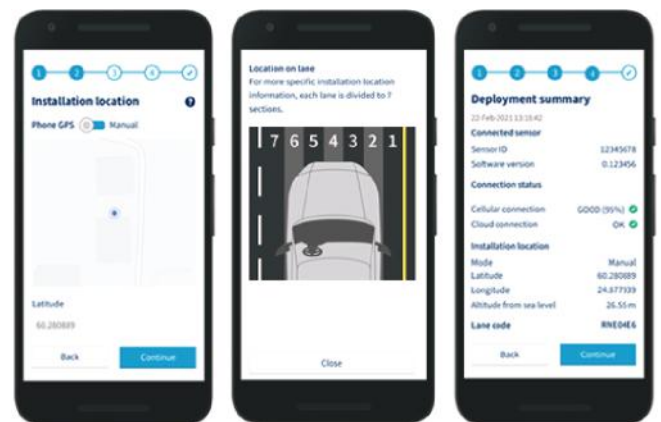
¹⁾ Sensor is not designed to be installed in sand or gravel roads, as it will not stay on the surface level, and the sensor performance is optimized for paved surfaces.
²⁾ Vaisala recommends the use of Fabick® sealant, but it is not available in all countries. For using locally available sealants, please check the suitability with Vaisala.



Dimensions

Compliance

EU directives	EMC Directive (2014/30/EU)
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B FCC part 15, class B ICES-3 (B)
Electrical safety	IEC 62368-1
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Damp heat	IEC 60068-2-78
Compliance marks	CE



Sensor Deployment application (Android)