

GroundCast

Vaisala Cast™ Sensor



Vaisala GroundCast 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 road weather stations.

Stay ahead of winter weather

Efficient winter maintenance decision-making requires understanding of current and future road conditions. GroundCast measures the most important road weather parameters, such as surface temperature. This data automatically enhances road weather forecasts provided by Wx Horizon and allows you to make more accurate winter maintenance decisions.

Easy access to data

The measurement data from GroundCast is automatically available in Vaisala Wx Horizon and through an API. A map view helps to understand the overall road conditions, whereas location-specific graphs and forecasts provide insight into future conditions. You can also set up alerts and notifications to ensure you never miss important weather events again.

Features

- Wireless NB-IoT communication
- Self-powered with 3+ year battery lifetime
- Measures:
 - Temperature at 3 levels: surface 0 cm, -6 cm, -30 cm (0 in, -2.4 in, -11.8 in)
 - Treatment material amount
 - Surface state (dry / not dry)
- Reports observations with enhanced point forecasts
- Installation takes less than 60 minutes
- Drilled to road
- Installation to any lane location, including wheel track
- Maintenance-free due to self-leveling cushion mechanism (patent-pending)
- Data available through Vaisala Wx Horizon or API

Measure from locations not possible before

GroundCast is wireless, self-powered, and operates as a standalone unit. It is a cost-effective way to add measurement locations to your current observation network. It is also an ideal starting point if you do not already have access to local observations.

GroundCast provides the same measurement accuracy as Vaisala road weather stations and sensors. This ensures all data from your road network is comparable and reliable.

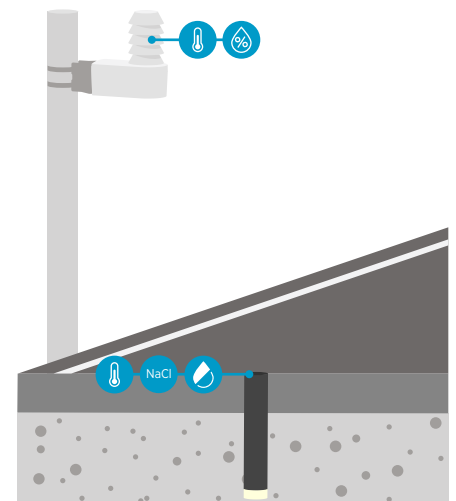
3+ year lifetime without maintenance

GroundCast includes a patent-pending wear-with-road mechanism that ensures the sensor stays leveled with the road surface, even in roads where studded winter tires are used.

The sealed construction makes the sensor incredibly robust and helps to minimize the risk of water leakage.

Combine with Vaisala TempCast

When you want to monitor frost formation more reliably and further enhance your road weather forecast, you can co-locate TempCast with Vaisala GroundCast.



Technical data

Measurement performance

Surface temperature

Measurements	0, -6, -30 cm (0, -2.4, -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⁾
-------------------------	----------------------------

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	IP68: 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 of the battery manufacturer.

Communication and data collection

Communication standard	Narrowband IoT (NB-IoT)
------------------------	-------------------------

SIM card type	Micro-SIM (3ff), provided by Vaisala
---------------	--------------------------------------

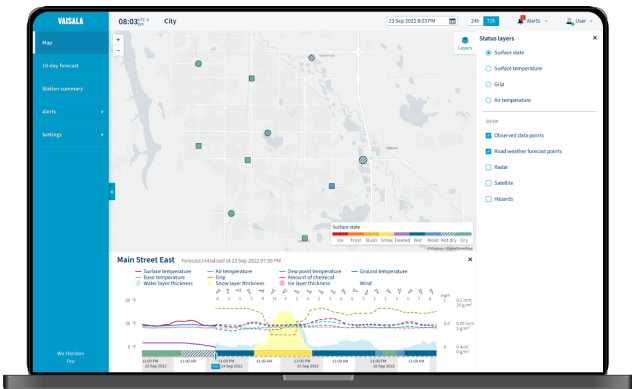
Local connection for sensor setup	NFC, disabled after installation
-----------------------------------	----------------------------------

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)
-----------------------	---

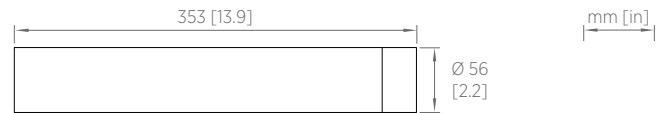
Installation

Recommended installation hole size	Ø 60 mm Depth: min. 360 mm (14.17 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.



Compliance

EU directives and regulations	RED, RoHS
-------------------------------	-----------

EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)
-------------------	--

Radio compatibility	EN 301 489-1, -17, -52 EN 300 328 EN 301 908-1
---------------------	--

Electrical safety	IEC 62368-1
-------------------	-------------

Cold	IEC 60068-2-1
------	---------------

Dry heat	IEC 60068-2-2
----------	---------------

Vibration (sinusoidal)	IEC 60068-2-6
------------------------	---------------

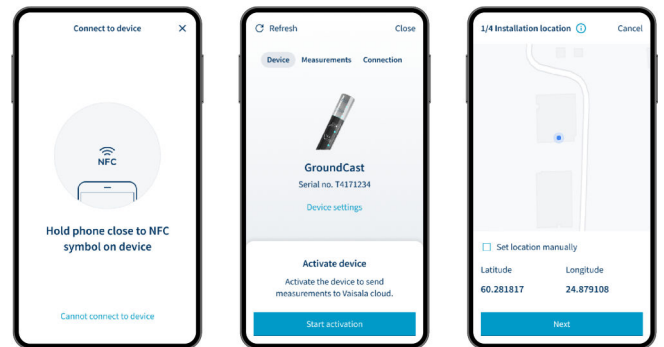
Vibration (random)	IEC 60068-2-64
--------------------	----------------

Change of temperature	IEC 60068-2-14
-----------------------	----------------

Damp heat, cyclic	IEC 60068-2-30
-------------------	----------------

Damp heat	IEC 60068-2-78
-----------	----------------

Compliance marks	CE, UKCA
------------------	----------



Vaisala Cast Connect application (Android)



www.vaisala.com

Published by Vaisala | B212425EN-D © Vaisala 2023

All rights reserved. Any logos and/or product names are trademarks of Vaisala or its individual partners. Any reproduction, transfer, distribution or storage of information contained in this document is strictly prohibited. All specifications — technical included — are subject to change without notice.