MARWIS

Mobile Advanced Road Weather Information Sensor

MARWIS is the first road and runway weather sensor detecting road conditions, temperatures, friction, and other parameters mobile and in real-time from driving vehicles.

Lufft

OTT HydroMet

Plug and play

100 Measurements per second with max. output rate of 10Hz

Real time thermal mapping

Wireless data transfer

The mobile road weather sensor MARWIS turns vehicles into driving weather stations by detecting several critical road and runway weather parameters. It can be installed on vehicles with a distance of 1 - 2 m above the surface and delivers information about temperatures, waterfilm heights, dew points, road conditions (dry, moist, wet, snow, ice), ice percentages, relative humidity and friction with a frequency of up to 100 times per second and a max. output rate of 10

Hz. It serves as important decision support with regard to preventive gritting. Due to the open interface protocols, MARWIS can be easily integrated into existing winter maintenance monitoring networks. Similarly, the mobile road sensor can communicate directly with the control system on gritting vehicles. The measurement data output supports the protocol UMB binary.

Parameters measured

- Road condition (dry, moist, wet, ice, snow, slush, chemically wet),
- Road surface temperature
- Ambient temperature
- Water film height up to 6mm,
- Dew point temperature
- Relative humidity,
- Ice percentage,
- Friction (calculated)

Measurement technology

- Optical LED transmitters,
- Photo receivers,
- Pyrometer,
- Infrared

Interfaces

- Bluetooth,
- RS-485,
- CAN-Bus

Technical specifications

General

Dimensions	height approx. 110 mm, width approx. 200 mm, depth approx. 100 mm
Weight	1.7 kg
Admissible storage temperature	−40 °C to +70 °C
Operating relative humidity	<95 % relative humidity non-condensing
Operating voltage	10 to 28 V DC on the sensor
Power consumption	approx. 3 VA without heating, 50 VA with heating
Operating temperature	−40 °C to +60 °C
Operating relative humidity	0 to 100 %RH
Protection type	IP 68
Surface conditions	dry, damp, wet, snow-/ice-covered, chemically wet, slush
Admissible height aboveabsolute altitude	3000 m
Interface	RS-485, 2 wire, half duplex, bluetooth, CAN

Road surface temperature

Principle	optical
Measuring range	−40 °C to 70 °C
Unit	°C
Accuracy	± 0.8 °C @ 0 °C
Resolution	0.1 °C

Ambient temperature

Measuring range	−50 °C to 70 °C (°F switchable)
Unit	°C (°F switchable)
Resolution	0.1 °C

Relative air humidity

Measuring range	0 to 100 %
Unit	%
Resolution	1 %
Principle	passive, calculated out of air temperature and humidity

Relative humidity above roadsurface

Measuring range	0 to 100 %
Unit	%
Resolution	0.1 %
Principle	passive, calculated out of air temperature and humidity above road surface

Dew point temperature

Measuring range	−50 °C to 60 °C
Unit	°C
Resolution	0.1 °C
Principle	passive, calculated out of air temperature and humidity
Accuracy	1.5 °C @ temperature of 0 to 35 °C

Waterfilm film height

Principle	optical
Measuring range	0 to 6000 µm max. WFH is only achieved with concrete underground. For asphalt, the maximum measurable water film height is smaller and depends on the distance to the ground.
Unit	µm
Resolution	1 µm
Accuracy	10 %

Ice percentage

Measuring range	0 to 100 %
Unit	%
Resolution	1 %

Friction

Measuring range	0 to 1
Resolution	0.01