Technical Data

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.

- **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

- **Product highlights**
  Mobile, plug and play, 100 measurements per second with max. output rate of 10Hz, multifunctional, real time thermal mapping, wireless data transfer

- **Interfaces**
  Bluetooth, RS485, CAN-Bus

- **Article number**
  8900.U03, 8900.U04

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 - 2m above the surface and delivers information about temperatures, waterfilm heights, dew points, road conditions (dry, moist, wet, snow, ice), ice percentages, rel. humidity and friction with a frequency of up to 100 times per second and a max. output rate of 10 Hz. It serves as an 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.

General	
Dimensions	Height approx. 110 mm, width approx. 200 mm, depth approx. 100 mm
Weight	1.7 kg
Admissible storage temperature	-40...70 °C
Operating rel. humidity	<95 % relative humidity non-condensing
Operating voltage	10...28 VDC on the sensor
Power consumption	Approx. 3VA without heating, 50VA with heating
Operating temperature	-40...60 °C
Operating rel. humidity	0...100 % RH
Protection type	IP68
Surface conditions	Dry, damp, wet, snow-/ice-covered, chemically wet, slush
Admissible height above absolute altitude	3000 m
Interface	RS485, 2 wire, half duplex, bluetooth, CAN

Road surface temperature	
Principle	Optical
Measuring range	-40...70 °C
Unit	°C
Accuracy	± 0.8 °C @ 0 °C
Resolution	0.1 °C

Ambient temperature	
Measuring range	-50...70 °C (°F switchable)
Unit	°C (°F switchable)
Resolution	0.1 °C

Relative air humidity	
Measuring range	0...100 %
Unit	%
Resolution	0.1 %
Principle	passive, calculated out of air temperature and humidity

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

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

Water film height	
Principle	Optical
Measuring range	0 ... 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%
Snow depth	up to 50 mm

Ice Percentage	
Measuring range	0 ... 100 %
Unit	%
Resolution	1%

Friction	
Measuring range	0...1
Resolution	0.01