



## Brochure

# Road Condition Monitoring

Observer offers a wide range of sensors and weather stations to monitor the condition of the road in real-time. Intelligent active and passive sensors for flush-mounting into the road or runway surface. Nowadays more and more interest is shown for non-invasive measurements using the optical principle. The sensors are used on highways, bridges, local roads, bicycle roads, industrial terrains, container terminals and runways.

The following variables can be measured:

- road surface temperature
- water film height
- freezing temperature
- road condition (dry/damp/wet/ice/slush/snow/residential salt/freezing/friction (grip)/ice percentage),
- visibility
- present weather
- precipitation
- snow depth
- air temperature
- relative humidity
- barometric pressure
- solar radiation
- wind speed- and direction

## Road condition sensors

### Non Invasive Road Sensor NIRS31 and Intelligent Passive Road Sensor IRS31Pro

Dependent on the requirements of any traffic-related weather network, there is a need for embedded and/or non-invasive/non-intrusive sensing equipment.

NIRS31 adds to the series of pavement sensors: an intelligent sensor which is part of the pole or part of the bridge surpassing the highway. NIRS31 is a Non invasive road sensor with optical sensors. The sensor is often used on bridges, which do not allow the use of embedded sensors, the NIRS31 is an alternative to the IRS31 Pro. Road sections that need frequent asphalt reconstruction, prefer non-invasive technology as well, to reduce the maintenance costs.



Passive Road Sensor IRS31Pro is flush-mounted in the road

### Intelligent Passive Road Sensor IRS31Pro and Intelligent Active Road Sensor ARS31Pro

The ARS31Pro and IRS31Pro sensors are flush-mounted in the road/runway surface.

The ARS31 Pro measures the freezing temperature by means of active cooling and heating of the sensor surface. In addition, the ARS31Pro-UMB measures dry/wet-conditions and the road surface temperature.

The following variables are recorded by the IRS31Pro: Road surface temperature, water film height up to 4 mm, freezing temperature for different de-icing materials (NaCl, MgCl, CaCl), road condition (dry/damp/wet/ice or snow/residual salt/freezing rain), friction (grip) and ice percentage.



Non Invasive Road Sensor NIRS31 is mounted on a portal above the road





## Mobile & Stationary Road Weather Information Sensor

### Mobile Road Weather Information Sensor — MARWIS

A new development, is the MARWIS, a mobile road weather information sensor, which reliably and professionally measures road conditions and environmental data and fills the data gap between the weather stations along the road. Directly installed at the vehicle, the intelligent sensor measures at a frequency of 100 times per second – at any place and any time.

Complement the stationary monitoring network with dynamic (mobile) data. Automatic optimization of gritting material. Dynamic route optimization for winter maintenance operations. Real time thermal mapping.

MARWIS used the measurement principle (optical spectroscopy): water and ice absorbs certain wave length differently. In case there is a water or an ice layer on the road, the spectral characteristics change. Through these characteristics the road condition, the water film height as well as the ice percentage are determined. Further integrated sensors specify the road surface temperature and the dew point.

The road surface sensors are mounted on vehicles in accordance with the requirements for a road traffic meteorological monitoring network. MARWIS for the detection of water, ice and snow as well as friction can be installed on vehicles with a distance of 1-2 meters between the measuring instrument and the (road) surface.

#### Features:

- Road surface conditions such as dry, moist, wet, ice and snow.
- Road surface temperature
- Water film height
- Dew point temperature
- Ice percentage
- Friction
- Rel. humidity above road surface

MARWIS mounting options





MARWIS - Mobile Road Weather Information Sensor

When the number of ice particles on the road surface increases, the friction coefficient falls and can thus serve as an important element of decision-making with regard to preventive gritting. Due to the open interface protocols, MARWIS can be easily integrated into existing winter maintenance monitoring networks. Similarly, MARWIS can communicate directly with the control system on gritting vehicles. The measurement data output supports the following protocols: UMB binary over CAN bus or Modbus.

#### Advantages

- Determined black holes in your weather forecast.
- Mobile weather sensors help to record reliable measurement data in real time – anywhere, any time. For a better forecast in a mobile world.
- Dynamic (spreading) control of the gritting.
- The sensor relays microclimatic measurements in real time and records all relevant environmental measurement data direct to the controller in the gritting vehicle.
- MARWIS converts your vehicle fleets into rapid response weather stations. Every navigation system requires reliable weather data in order to reliably calculate travel time. Away from single point information to specific, route-related weather data.
- MARWIS makes weather networks mobile.
- The same real time information in the winter maintenance service for both mobile personnel and control centre – for operational planning purposes.
- Optimize routes and avoid unnecessary operations.

#### Stationary Road Weather Information Sensor—StarWIS

For stationary operations is developed the innovation award-winning MARWIS - this is StarWIS!

StarWIS is the first non-invasive road weather sensor detecting road and runway surface conditions, surface temperatures, relative humidity, dew & freezing temperatures, ice percentages as well as friction non-invasively and based on innovative LED Technology with 4 lenses.



## Other sensors

In addition to road condition sensors, Observator has also many sensors and systems, that are used on bridges, within tunnels, nearby highways, to measure local meteorological and other parameters. Important decisions either automatically or through human intervention, are taken on this vital information.

### OMC-116 Full metal Ultrasonic wind sensor

The OMC-116 is an ultrasonic wind sensor based on the time of flight theory. The unit is provided with industrial standard NMEA0183 output and can optionally be provided with 4.20 mA signals.

### OMC-406 Temperature / Humidity sensor

The air temperature and humidity probe OMC-406 provides accurate and precise measurements of both temperature and humidity in two 4...20 mA outputs.

### OMC-422 Radiation Shield

The radiation shield, designed to house temperature and humidity probes and protect them from the heating effects of solar radiation and direct exposure to rain and snow.

### SWS-100 Visibility and Present Weather Sensor

The SWS-100 with a measuring range up to 2 km is designed to detect snow, rain, drizzle, fog and haze on roads and in tunnels. With both digital and analogue outputs as well as relays for switching external equipment the sensor can be integrated into Intelligent Transport Systems.

## Software

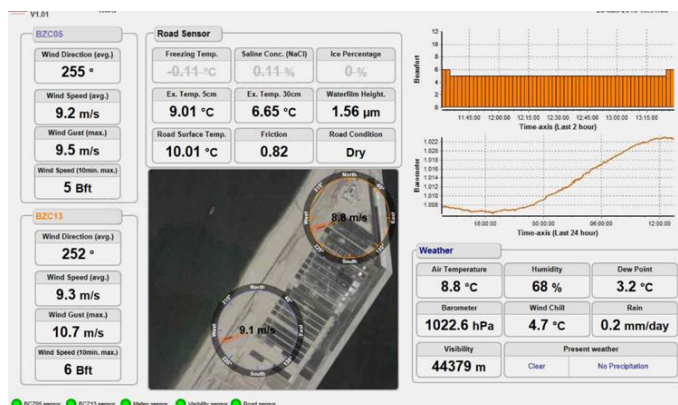
Observator's software program OMC-Data-OnLine, is capable to collect, view and manage data from all road monitoring sensors in real-time, fixed as well as mobile ones, into a single database.

The data can subsequently be viewed in tables, graphs and reports in a very easy way. In addition to directly viewing the data, it is also possible to perform calculations on the collected data.

The measured data can be send to Weather offices in other to do specific local Weather forecasting. This forecast can also be implemented in our software. The collected data can also be used to trigger the alarm module, integrated in our software program.

Finally, using a browser you can view your data anywhere, anytime, using your Smartphone, tablet or PC.

Screenshot OMC-Data-OnLine



## Welcome to the world of Observator

Since 1924 Observator has evolved to be a trend-setting developer and supplier in a wide variety of industries. Originating from the Netherlands, Observator has grown into an internationally

oriented company with a worldwide distribution network and offices in Australia, Germany, the Netherlands, Singapore and the United Kingdom.

[www.observator.com](http://www.observator.com)