Datasheet

Non Invasive Road Sensor NIRS31-UMB

The road sensors use optical measuring principles. Without a need to install embedded sensors, these non-intrusive multi-sensor-systems have integrated microprocessors to identify all road and runway conditions. The measurement principle (optical /spectroscopical): Water absorbs certain wave lengths differently. If there is a water layer on a runway or a highway, then the spectral characteristics are changed.

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-UMB adds to series of pavement sensors: an intelligent sensor which is part of the pole or part of bridge surpassing the motorway. Mainly on bridges, which do not allow in all cases embedded sensors, the NIRS31-UMB is an alternative to IRS31-UMB. Microclimates that need frequent asphalt reconstruction prefer non-invasive technology as well to reduce the maintenance costs.

Features

- No destruction of asphalt
- Easy to mount
- Measurement of surface conditions such as wetness, ice, snow, or frost.
- Measurement of water film height
- Measurement of ice percentage in water and determination of freeze temperature
- Measurement of friction
- Fully integrated surface temperature measurement (pyrometer)
- Electric Isolation of RS485 interface for network with other UMB sensors
- Firmware-Updates via UMB-technology

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General

The typical distance between the surface measurement spot and the sensor is 6 ...15 meters. In addition to the well-known measurements in winter-related road networks

- Water film
- Surface temperature
- Freeze point temperature

The sensor delivers the new information "friction". Whenever the quantity of ice particles increase on the measured spot, the friction reading will be changed and herewith can be used for on-time treatments. Non-invasive sensors cannot measure depth temperature(s).
Measurement output can be accessed by the following protocolls: UMB-Binary, SDI-12.

Including UMB-Config-Tool Software for:

- Configuration of sensors
- Onsite calibration
- Real-time date of sensor
- Firmware-Update for UMB sensors
- Analogue outputs in combination with 8160 UDAC

Data summary

Technical data

• Dimensions	Height +/- 425mm	
	Width +/- 225mm	
	Depth +/- 285mm	
• Weight	10 kg	

Storage conditions

- Ambient air temperature   -40°C … 70°C
- Ambient rel. humidity   < 96% RH, non condensing

Operating conditions

- Operating voltage   24VDC +/- 10% (22—30 VDC)
- Power consumption   approx. 40VA
- Temperature   -40°C … 60°C
- Protection type   IP65

Layer thickness
Water, snow and ice

- Principle   Optical
- Measurement range   0….2mm (snow 0….10mm)
- Resolution   0.01mm

Surface temperature

- Principle   Pyrometer
- Measurement range   -40°C … 70°C
- Accuracy   ± 0.8°C
- Resolution   0.1°C

Surface conditions
Dry, damp, wet, snow and ice

Friction

- Measurement range   0...1 (critical...dry)

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