

# NIRS31-UMB – non invasive measurements using optical principle

Lufft road sensors use optical measuring principles. Without a need to install the 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.

## Measurement of surface conditions such as wet ice, snow, or frost.

Dependent on the requirements of any traffic-related weather network, there is a need for embedded and/or non-invasive/non-intrusive sensing equipment. Luffts NIRS31-UMB adds to Lufft 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 of Luffts IRS31-UMB. Microclimates, who need frequent asphalt reconstruction, prefer non-invasive technology as well to reduce the maintenance costs.

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 **-waterfilm -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 protocols:  
UMB, SDI12

UMB-Config-Tool Software for:

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

NIRS31-UMB Non Invasive Sensor		Order No.
<ul style="list-style-type: none"> <li>- Measurement of surface conditions such as wetness, ice, snow, or frost.</li> <li>- Measurement of water film height</li> <li>- Measurement of ice percentage in water and determination of freeze temperature</li> <li>- Measurement of friction</li> <li>- Fully integrated surface temperature measurement (pyrometer) an option</li> <li>- Electric Isolation of RS485 interface for network with other UMB sensors</li> <li>- Easy to mount</li> <li>- Firmware-Updates via UMB-technology</li> </ul>		8710.U01
Technical Data	Dimensions	H. ca. 425mm, W. ca. 225mm, D. ca. 285mm
	Weight	10 kg
Storage conditions	Ambient air temperature	-40°C ... +70°C
	Ambient rel. humidity:	< 95% RH, non condensing
Operating conditions	Operating voltage	24VDC +/- 10% (22 – 30VDC)
	Power consumption	approx. 50VA
	Temperature	-40°C...+60°C
	Protection type	IP65
Layer thickness	Water, Snow, Ice	
	Principle	Optical
	Measurement range	0...2mm (snow 0 ... 10 mm)
	Resolution	0.01 mm
Surface temperature (optional)	Principle	Pyrometer
	Measurement range	-40 ... +70 °C
	Accuracy	±0.8°C
	Resolution	0.1 °C
Surface conditions	Dry, Damp, Wet, Critical Wetness, Snow, Ice	
Friction	Measurement range 0...1 (critical ... dry)	
Accessories	Surge protection	8379.USP
	Power supply 24V/4A	8366.USV1
	UMB Interface converter ISOCON	8160.UISO
	Digital-analog-converter	8160.UDAC

