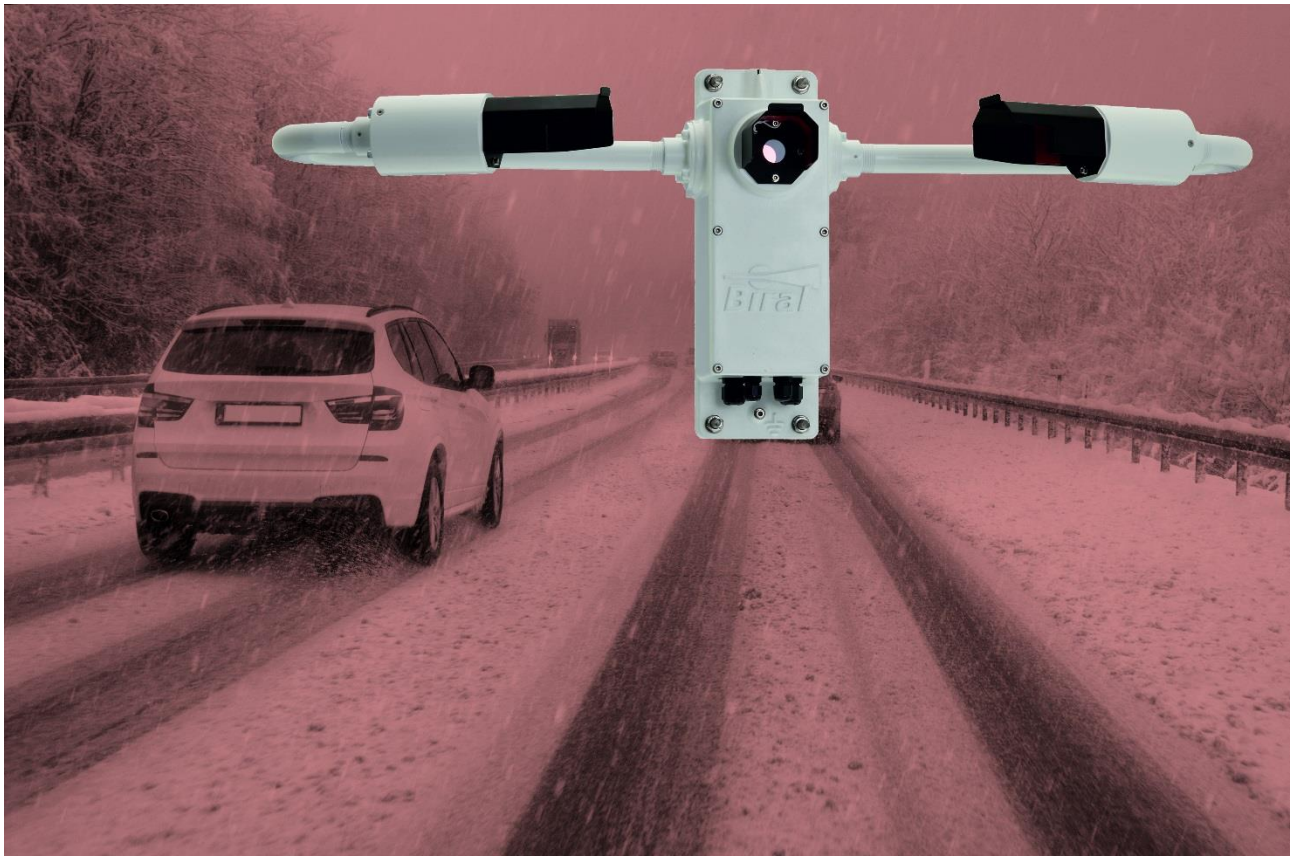

Visibility and present weather detection

Weather conditions monitoring to improve road safety

Visibility and present weather detection

Features

- Visibility sensor using forward and backward scattering to measure the meteorological optical range and detect the present weather
- 10 m to 75 km measuring range
- Instantaneous and averaged visibility outputs
- Present and past weather by 34 METAR codes
- 39 WMO 4680 codes
- Hood and windows heated
- Comprehensive self-test and maintenance data
- Optical windows monitored for contamination
- Optional ambient light sensor
- RS-232, RS-422 and RS-485 interface
- Automatic or polled mode

System setup

- Visibility sensor to be mounted on pole or wall
- Connection to control system or openWIS

Operation

The sensor is optimised for use in aviation applications where both visibility and extended present and past weather information is required. It measures measures visibility, fog, haze, drizzle, snow, hail and other non-frozen precipitation according to WMO table 4680. METAR coded outputs are also provided.

For ultimate visibility performance the visual range extends to 75km allowing use in meteorological observation networks and research applications.

The enhanced present weather information is due to the backscatter receiver which allows detailed precipitation analysis.

Heating of the optical windows and sensor hoods is provided as standard allowing use in the harshest of conditions. All optical windows are monitored for contamination and the visibility output is automatically compensated to reduce maintenance requirements.

The unique design ensures that the output is both accurate and reliable in all weather conditions and will not be influenced by local lights sources, even those that flash.

Advantages

- Compact forward and back scatter design
- Detailed classification of precipitation
- Not affected by local lights
- Simple field calibration
- Hood heating for use in extreme environments
- Easily installed by one person
- Flexible integration into control system
- openWIS compatible

Application

Weather influences road, air and rail traffic. For operators and users of the according traffic infrastructure it is thus necessary to be aware of the prevailing weather conditions.

Drivers may need to adapt to the conditions, operators may need to take measures to maintain traffic safety.

For road and air traffic it is thus essential that sensors reliably and accurately determine the visibility as well as the road or runway conditions.

Road and airport operators can – based on this information – more efficiently control the winter operations.

Moreover, road operators may warn drivers about a slippery road or reduce the speed limit.

In aviation pilots or ATC can decide if takeoffs and landing are still possible and/or legal.

Since 1990 JES Elektrotechnik GmbH develops, installs and maintains systems to monitor air quality and lighting conditions in tunnels. Our systems are robust, durable and resistant against the corrosive atmosphere in a tunnel. They operate reliably and have a high accuracy in measurement.

Weather stations for traffic applications are a logical extension to our product portfolio and underline our competence in environmental monitoring solutions.

Our range of products for tunnels covers systems for monitoring of

- Toxic gases like CO, NO, NO_2 (extractive or in-situ)
- Visibility (extractive or in-situ)
- Air speed, direction and temperature
- Luminance (access, threshold and interior zone)
- Illuminance

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Visibility and present weather detection

Technical Specifications

Visibility & present weather detection	
Measuring method	Forward light scattering with 39° to 51°angle and back-ward light scattering
Measured values	Visibility (MOR) Extinction coefficient Transmission equivalent extinction coefficient Present weather (WMO 4680, METAR) Precipitation intensity
Measuring range	10 m .. 75 km (MOR) 0 .. 500 mm/hr (rain intensity)
Accuracy	≤ 4.5% at 600m, ≤ 5.0% at 1,500m, ≤ 5.1% at 2km, ≤ 12.5% at 15km, ≤ 20% at 30km (MOR) ≤ 15 % (rain intensity)
Precipitation detection threshold	Rain: 0.015 mm/hr Snow: 0.0015 mm/hr

Sensor	
Type	w/PWD (BIRAL SWS-250)
Operating voltage	9 .. 36 VDC
Hood heating	24 VDC or 24 VAC
Power consumption	3.5 W (sensor) 2.5 W (window heaters) 36 W (hood heaters)
Housing material	Powder coated aluminium
Dimensions	811 x 315 x 329 mm
Weight	3.5 kg
Protection class	IP66
Temperature range	-40 .. 60 °C

Outputs	
Digital interface	RS-232, RS-422 or RS-485
Interface modes	Polled or automatic
Output rate	10 .. 300 s (automatic mode)
WMO codes	39 from table 4680
METAR codes	34 present and past weather

Conformities	
Electrical standards	2014/30/EC EMC directive 2014/35/EC Low voltage directive
Road safety	AT: RVS 12.04.14 Straßenzustandsinformationssysteme für den Winterdienst (November 2014) DE: Technische Lieferbedingungen für Streckenstationen Ausgabe 2012 (TLS 2012)

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