



Visibility monitoring (Meteorological optical range)

Weather conditions monitoring to improve road safety

Features

- Visibility sensor using forward scattering to measure the meteorological optical range
- 10 m to 40 km measuring range
- 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
- Optional analogue output

System setup

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

Operation

The sensor uses the forward scatter measuring method to determine the meteorological optical range.

The transmitter on one side emits light which is scattered by particles in the air. The receiver on the other side receives the share of the light which is scattered at an angle 39° to 51°. The intensity of the received light is used to calculate the meteorological optical range.

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.

With a measuring range of 10 m to 40 km the sensor is suitable for use in road and aviation applications as well as meteorological observation networks. Whilst the measurement accuracy easily exceeds that specified by ICAO for visibility sensors used in METAR and RVR applications.

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

Advantages

- Compact forward scatter design
- Not affected by local lights
- Easily installed by one person
- Hood heating for use in extreme environments
- 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, NO₂ (extractive or in-situ)
- Visibility (extractive or in-situ)
- Air speed, direction and temperature
- Luminance (access, threshold and interior zone)
- Illuminance

Technical Specifications

Visibility measurement	
Measuring method	Forward light scattering with 39° to 51° angle
Measured values	Visibility (MOR) Extinction coefficient
Measuring range	10 m .. 40 km
Accuracy	≤ 4.5% at 600m, ≤ 5.0% at 1,500m, ≤ 5.1% at 2km, ≤ 12.5% at 15km, ≤ 20% at 30km

Sensor	
Type	w/MOR (BIRAL SWS-050)
Operating voltage	9 .. 36 VDC
Hood heating	24 VDC or 24 VAC
Power consumption	3.5 W (sensor) 1.7 W (window heaters) 24 W (hood heaters)
Housing material	Powder coated aluminium
Dimensions	811 x 315 x 329 mm
Weight	4.3 kg
Protection class	IP66
Temperature range	-40 .. 60 °C

Outputs	
Analogue output	4-20 mA (optional)
Digital interface	RS-232, RS-422 or RS-485
Interface modes	Polled or automatic
Output rate	10 .. 300 s (automatic mode)

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



Contact

JES Elektrotechnik GmbH
Davisstrasse 7
5400 Hallein
Austria

Phone +43 (6245) 81785
Fax +43 (6245) 81785-600
Email info@tunnelsafety.at
Web www.tunnelsafety.at