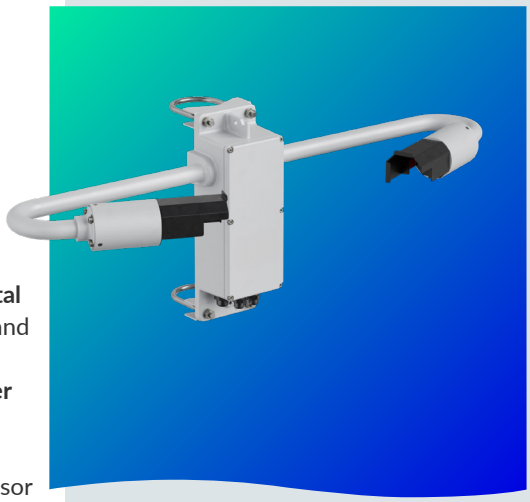
Visibility & Present Weather Sensor

SWS-100



INTRODUCTION

The **SWS-100** is a compact forward scatter visibility and present weather sensor for **applications requiring accurate, reliable measurements, including fundamental WMO Table 4680 precipitation codes.** Its serial output, with optional analogue and relay outputs, allows straightforward integration with almost any system.
The **default visibility range is 10 m to 2 km and can be extended by the customer up to 99 km** via configuration command. Measurement performance is proven comparable to that of a transmissometer while avoiding the size, cost and maintenance burden of traditional transmissometers. Calibration of the SWS sensor family is performed in accordance with ICAO 9328 and is traceable to a reference transmissometer, ensuring compliance with ICAO and WMO specifications for aviation, including use in Runway Visual Range (RVR) systems when combined with the ALS-2 Ambient Light Sensor.

FEATURES

Forward scatter visibility with WMO 4680 codes

Compact forward scatter sensor providing accurate visibility measurements with fundamental WMO Table 4680 present weather codes.

Wide 10 m to 99 km visibility range

Default range 10 m to 2 km, with the maximum visibility extendable by the customer up to 99 km using a configuration command; performance proven comparable to a transmissometer.

ICAO 9328 and WMO compliant

Calibrated in accordance with ICAO 9328 and traceable to a national weather service transmissometer; accuracy and selectable 1 m resolution meet ICAO and WMO requirements for aviation and RVR.

Versatile applications across sectors

Used in national meteorological networks, aviation RVR systems (with ALS-2), wind farm obstacle light control and dense road weather networks.

Present weather and precipitation identification

Reports drizzle, rain, snow, fog, haze and unidentified precipitation, helping distinguish the cause of reduced visibility for better operational decisions.

Low maintenance with hood heating

Window contamination monitoring with automatic correction and two-stage cleaning warnings, long recalibration intervals and standard hood heating (on at 2 °C, off at 4 °C) for reliable operation in blowing snow.

CONFIGURATION & MEASUREMENT

Visibility, EXCO and resolution

Reports instantaneous and averaged Meteorological Optical Range (MOR) with a default range of 10 m to 2 km, expandable by the customer up to 99 km via configuration command. Optional 1 m resolution and EXCO output are available. Standard ASCII messages also include WMO Table 4680 present weather codes.

Serial, analogue and ALS-2 interfaces

ASCII data is available via RS-232, RS-422 or RS-485. Depending on the version, the sensor can be supplied either with analogue and relay interface (AR: 0–10 VDC and 4–20 mA plus relays) or with an ALS-2 interface (WA), which appends ambient light data for RVR applications.

Relay outputs and local control

Volt-free change-over relays can be configured for visibility thresholds, precipitation or snow detection and sensor failure, enabling direct control of obstacle lights, road signs or other local devices.

Installation, self-test and functional test mode

Designed for single-person installation and easy integration. Self-test information is included in every message, with full reports on request. A functional test mode allows simulation of visibility, present weather, contamination and fault conditions for FAT/SAT and system checks.

- **SELECTABLE MEASUREMENT RANGE FROM 10 M TO 99 KM**
- **SELECTABLE MEASUREMENT RESOLUTION OF 1 M OR 10 M (DEFAULT)**
- **COMPACT FORWARD SCATTER DESIGN**
- **INSTANTANEOUS AND AVERAGED VISIBILITY OUTPUTS**
- **LIMITED WMO TABLE 4680 PRESENT WEATHER CODES**
- **HOOD HEATING FOR USE IN EXTREME ENVIRONMENTS**
- **DIGITAL OUTPUT, OPTIONAL ANALOGUES AND RELAY OUTPUT**
- **COMPREHENSIVE SELF-TEST AND MAINTENANCE DATA**
- **3 YEARS WARRANTY**

General specifications

OUTPUTS & REPORTS

Output rate (seconds)	10 to 300 selectable
Serial outputs	RS232, RS422 and RS485
WMO codes	7 WMO 4680 codes

POWER REQUIREMENTS

Sensor power	9-36 Vdc
Hood heating power	24 Vac or dc
Basic sensor	10 W
Hood heaters	24 W

ADDITIONAL FEATURES

Hood heaters	Optional
Window heaters	Fitted as standard
Window contamination monitoring	Fitted as standard to transmitter window. Optional on receivers.

ENVIRONMENTAL

Operating temperature	-40 °C to +60 °C
Operating humidity	0 – 100% RH
Protection rating	IP66/IP67

PHYSICAL

Material	Aluminium. Powder paint finish, with optional hard anodize base layer.
Weight	4.3 kg (including mounting kit)
Length	811 mm
Warranty	3 years
Lifetime	>10 years

CERTIFICATION & COMPLIANCE

- CE Certified
- EMC compliance with EN61326
- RoHS and WEEE compliant

Ordering codes

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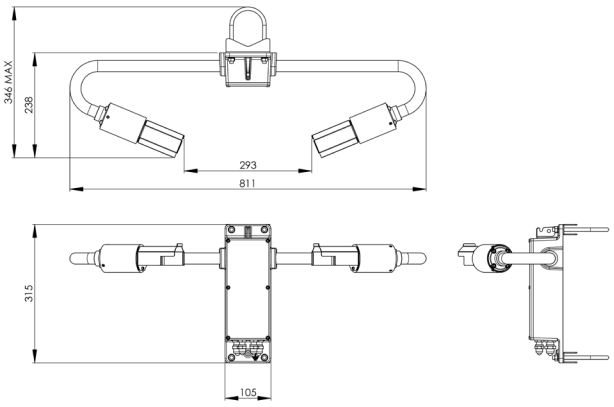
- Configuration
  RC = regular configuration
  SC = special configuration
- Option board
  NA. = without option board
  WA. = with ALS-2 Interface
  AR. = with analogues and relays interface
- Cable glands
  PG. = standard plastic cable glands
  MG. = single metal cable gland
- Self-Test and Monitoring
  S. = standard self-test and monitoring
  A. = advanced self-test and monitoring
- Stadard output RS232, RS422 and RS485
- Hood heating
  HV. = with heating
  NH. = without heating
- Housing
  Blank. = powder coated aluminium (standard)
  A. = hard coat anodized, powder coated

Example: 10A.HV.J.A.PG.NA.RC

Measurement specifications

Measures	Visibility, Present Weather (MOR & EXCO)	
Output	Serial data	
Range (visibility)	10 m to 2 km default. User adjustable maximum up to 99 km	
Measurement error	≤4.2% at 600 m	≤5.1% at 2 km
	≤6.8% at 5 km	≤9.6% at 10 km
	≤12.3% at 15 km	≤14.8% at 20 km
	≤17.1% at 25 km	≤19.4% at 30 km
Measurement resolution	1 m or 10 m (default)	
Measurement principle	Forward scatter meter with 39° to 51° angle, centred at 45°	
Precipitation detection threshold	Rain: 0.015mm/hr	(0.0006 in/hr)
	Snow: 0.0015mm/hr	(0.00006 in/hr)

Dimensions



Accessories – Optional

SWS.CABLE-D	SWS Series Data Cable per metre
SWS.CABLE-P	SWS Series Power Cable per metre
SWS.CAL	SWS Series calibration kit
SWS.SK100	SWS 100 spares kit
SWS.WTY100	1 year extended warranty
SWS.TEST1	SWS Test Plaque (single stage test kit)
SWS.TEST2	SWS Test Plaque (two stage test kit)

The sensor is delivered in sturdy recyclable foam filled packaging with: pole mounting kit (2 x U-bolt); user manual and calibration certificates.

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