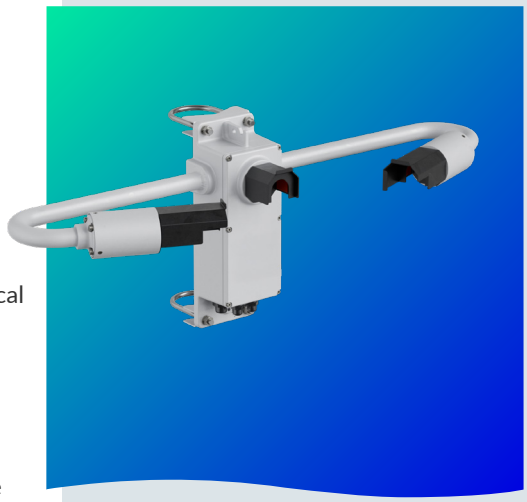
Visibility & Present Weather Sensor

SWS-200



INTRODUCTION

The **SWS-200 is a compact forward-scatter instrument with an additional backscatter receiver**, providing combined measurement of visibility (Meteorological Optical Range) and present weather, including discrimination between liquid and frozen precipitation. It is used in aviation, national observation networks, wind farms and road weather systems.

Default visibility range is 10 m to 20 km, with the maximum visibility user-configurable up to 99.99 km via a simple configuration command. Calibration of the SWS family follows ICAO 9328 and is traceable to a national weather service transmissometer, supporting ICAO and WMO requirements, including RVR systems when combined with the ALS-2 Ambient Light Sensor.

FEATURES

Long-range visibility with fine resolution

Standard 10 m to 20 km range, with the measurement range selectable from 10 m up to 99.99 km and 1 m or 10 m resolution.

Enhanced frozen precipitation detection

The combined forward and backscatter measurement improves separation of liquid and frozen precipitation, providing more reliable present weather reporting.

Present weather with WMO codes

Outputs visibility, precipitation type and intensity with WMO Table 4680 present weather codes for operational use in aviation and national networks.

Flexible integration options

Standard serial output by default, with an optional board slot available for either an ALS-2 interface, or analogue and relay outputs for legacy systems and local alarms.

Optimised for low maintenance

Window contamination monitoring with automatic compensation, heater options and built-in self-test reduce site visits and long-term operating costs.

CONFIGURATION & MEASUREMENT

Visibility, EXCO and present weather output

The SWS-200 reports instantaneous and averaged Meteorological Optical Range over a 10 m to 20 km default range, with the measurement range selectable from 10 m to 99.99 km and 1 m or 10 m resolution. The user can choose MOR or extinction coefficient (EXCO) output and enable WMO Table 4680 present weather codes, including precipitation type and intensity based on liquid/frozen discrimination.

Measurement principle

Particles crossing the sample volume are illuminated and measured using both forward and backscattered light. Analysis of signal strength, duration and the forward/backscatter ratio provides accurate visibility measurement and robust identification of liquid versus frozen precipitation.

Interfaces and option boards

Serial communication (RS-232, RS-422 or RS-485) is provided as standard. Depending on the selected option board, the sensor can be supplied without option board (serial only), with ALS-2 interface (ambient light data appended directly to the sensor message for RVR), or with analogue and relays interface (analogue outputs and configurable volt-free relays for visibility thresholds, precipitation or fault indication).

Installation, status and test functions

Designed for straightforward mounting and single-person installation. Self-test and contamination status are included in every data message, with detailed diagnostics and a functional test mode available to simulate visibility, present weather, contamination and fault conditions for FAT/SAT and system integration.

- **SELECTABLE MEASUREMENT RANGE FROM 10 M TO 99 KM**
- **SELECTABLE MEASUREMENT RESOLUTION OF 1 M OR 10 M (DEFAULT)**
- **WMO 4680 PRESENT WEATHER CODES**
- **COMPACT FORWARD SCATTER DESIGN**
- **WINDOW CONTAMINATION MONITORING AND COMPENSATION**
- **OPTIONALLY, DIRECT CONNECTION OF THE ALS-2 AMBIENT LIGHT SENSOR FOR USE IN RUNWAY VISUAL RANGE (RVR) APPLICATIONS**
- **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	14 WMO 4680 codes

POWER REQUIREMENTS

Sensor power	9-36 Vdc
Hood heating power	24 Vac or dc
Basic sensor	10 W
Hood heaters	36 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	4.5 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

20 | | | J. | | | | | |

Configuration
RC = regular configuration
SC = special configuration

Precipitation definitions
xx. = country code*

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

Standard output RS232, RS422 and RS485

Hood heating
NH. = without heating
HV. = with heating

Housing
Blank. = powder coated aluminium (standard)
A. = hard coat anodized, powder coated

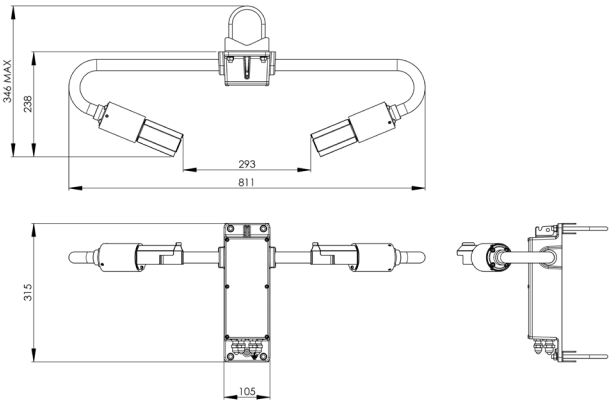
Example: 20A.HV.J.A.PG.NA.UK.RC

** For a full list of currently available country codes, please refer to our Sales Department.*

Measurement specifications

Measures	Visibility, Present Weather (MOR & EXCO)	
Output	Serial data	
Range (visibility)	10 m to 20 km default. User adjustable maximum up to 99 km	
Measurement error	≤4.2% at 600 m ≤6.8% at 5 km ≤12.3% at 15 km	≤5.1% at 2 km ≤9.6% at 10 km ≤14.8% at 20 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: 0.015 mm/hr Snow: 0.0015 mm/hr	(0.0006 in/hr) (0.00006 in/hr)
Precipitation intensity reporting range	0-1000 mm/hr	(39.4 in/hr)
Rain intensity accuracy	≤5%	

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.TEST1	SWS Test Plaque (single stage test kit)
SWS.TEST2	SWS Test Plaque (two stage test kit)
SWS.SK200	SWS 200 spares kit
SWS.WTY200	1 year extended warranty
PW.CODE	User defined precipitation definitions

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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