

Visibility & Present Weather Sensor

SWS-250

INTRODUCTION

The SWS-250 is the most advanced visibility and present weather sensor in the SWS family, offering many of the reporting capabilities of Senseca's flagship VPF-750 in a compact housing. An exclusive backscatter receiver, in addition to the forward scatter geometry, greatly improves present weather classification and allows a wider range of precipitation types to be identified with confidence, including reliable separation of frozen and non-frozen precipitation. This is particularly valuable in aviation and national observation networks.

Default visibility range is 10 m to 75 km, with the maximum visibility user-configurable up to 99 km using a simple VIS configuration command. The SWS-250 reports Meteorological Optical Range (MOR) and Extinction Coefficient (EXCO), with calibration traceable to a national weather service transmissometer in accordance with ICAO recommendations.

FEATURES

Advanced visibility & weather reporting

Combined visibility (MOR/EXCO) and present weather sensor reporting both WMO Table 4680 and METAR present and past weather codes.

Exclusive backscatter receiver

Forward scatter plus a dedicated backscatter channel provide outstanding ability to distinguish frozen from liquid precipitation, even in challenging conditions.

Wide, configurable visibility range

Default visibility range from 10 m to 75 km, with the measurement range selectable from 10 m up to approximately 99 km and a choice of 1 m or 10 m resolution.

Low maintenance, all-weather design

Window heaters, heated hoods and automatic window contamination monitoring are fitted as standard, maintaining data quality while reducing cleaning and site visits.

Easy integration with ALS-2

Direct interface option for the ALS-2 Ambient Light Sensor simplifies use in aviation systems requiring both METAR and RVR information.

CONFIGURATION & MEASUREMENT

Visibility and EXCO measurement

The SWS-250 uses a forward scatter optical geometry to measure the light scattered by particles in the sample volume. It reports Meteorological Optical Range and atmospheric extinction coefficient over a default 10 m to 75 km range, with the measurement range selectable from 10 m up to approximately 99 km and 1 m or 10 m resolution via a simple VIS configuration command.

Present weather principle and performance

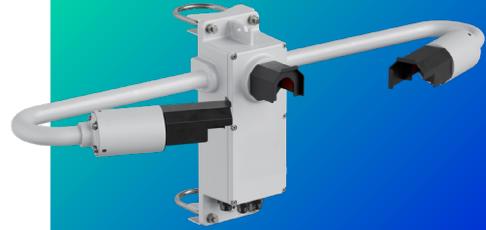
An exclusive backscatter receiver, combined with the forward scatter signal, allows precipitation type to be determined from particle intensity, transit time and the forward/backscatter ratio, giving reliable separation of liquid and frozen precipitation and identification of a wider range of weather types.

Codes, interfaces and ALS-2 option

Standard RS232, RS422 and RS485 serial outputs carry MOR, EXCO and present weather according to WMO Table 4680 and METAR present and past weather codes, with optional country-specific definitions. An ALS-2 interface option appends ambient light data directly to the SWS-250 message for easy integration into aviation METAR and RVR systems.

Diagnostics and functional test

Continuous self-test monitors key functions, including window contamination, applies automatic compensation and issues two-stage cleaning warnings. A functional test mode allows simulation of visibility, present weather, contamination and fault conditions to support FAT/SAT and system integration.



- **WMO TABLE 4680 AND METAR PRESENT AND PAST WEATHER CODES**
- **AUTOMATIC WINDOW CONTAMINATION MONITORING – ENSURES OPTIMUM ACCURACY WHILST MINIMISING MAINTENANCE REQUIREMENTS**
- **WIDE RANGE OF VISIBILITY REPORTING FORMATS INCLUDING METEOROLOGICAL OPTICAL RANGE (MOR) AND ATMOSPHERIC EXTINCTION COEFFICIENT (EXCO)**
- **OPTIONALLY, EASY INTEGRATION WITH THE ALS-2 AMBIENT LIGHT SENSOR – FAST INSTALLATION, RELIABLE RESULTS**
- **10 M TO 99.99 KM MEASUREMENT RANGE**
- **SELECTABLE MEASUREMENT RESOLUTION OF 1M OR 10M (DEFAULT)**
- **CALIBRATION TRACEABLE TO A NATIONAL WEATHER SERVICE TRANSMISSOMETER IN ACCORDANCE WITH ICAO STANDARDS**
- **3 YEARS WARRANTY**

General specifications

OUTPUTS & REPORTS

Output rate (seconds)	10 to 300 selectable
Serial outputs	RS232, RS422 and RS485
WMO codes	42 Table 4680 codes
METAR Codes	36 present and past weather

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	Fitted as standard
Window heaters	Fitted as standard
Window contamination monitoring	Fitted as standard to all sensor head windows

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

25	HV.	J.	A.			
Configuration RC = regular configuration SC = special configuration						
Precipitation definitions xx. = country code*						
Option board NA. = without option board WA. = with ALS-2 Interface						
Advanced self-test and monitoring						
Standard output RS232, RS422 and RS485						
With heating						
Housing Blank. = powder coated aluminium (standard) A. = hard coat anodized, powder coated						

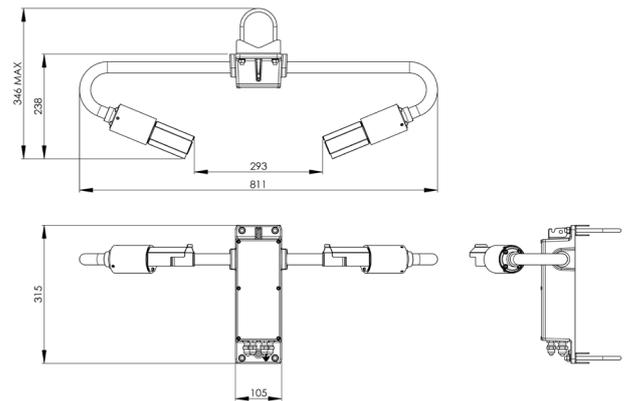
Example: 25A.HV.J.A.NA.UK.RC

* 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 75 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 ≤17.1% at 25 km	≤5.1% at 2 km ≤9.6% at 10 km ≤14.8% at 20 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: 0.015 mm/hr (0.0006 in/hr) Snow: 0.0015 mm/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.WTY250	1 year extended warranty
PW.CODE	User defined precipitation definitions

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