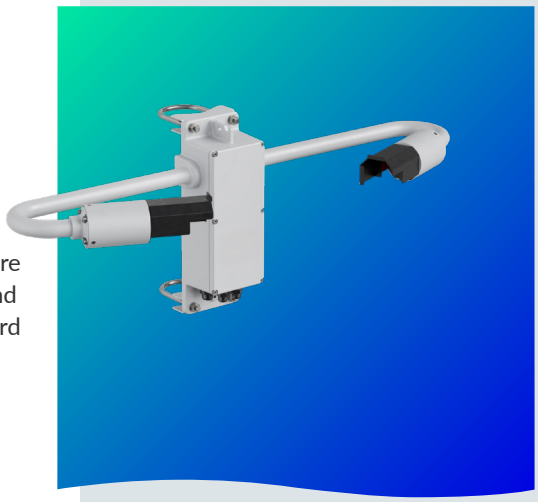
Visibility Sensor

SWS-050



INTRODUCTION

The **SWS-050** is a compact forward scatter visibility sensor for applications where accurate and reliable measurements are required. The measurement principle and robust design ensure stable performance in all weather conditions, while standard hood heating and advanced self-test functions make it Senseca's most cost-effective visibility solution.

With a fixed measurement range from 10 m to 40 km and performance proven to be comparable to a transmissometer, the SWS-050 meets ICAO and WMO specifications for aviation use. Calibrated in accordance with ICAO 9328 and traceable to a national weather service transmissometer, it can be used both as a general-purpose visibility sensor and, together with the ALS-2 Ambient Light Sensor, as part of instrumented Runway Visual Range (RVR) systems.

FEATURES

Forward scatter visibility technology

Uses the forward scatter principle, offering significant advantages over backscatter and transmissometer systems in a compact, low-maintenance design.

10 m to 40 km visibility range

Provides accurate Meteorological Optical Range (MOR) and Extinction Coefficient (EXCO) over a fixed 10 m to 40 km range.

ICAO & WMO compliant, ICAO 9328 calibration

Measurement performance, accuracy and resolution comply with ICAO and WMO specifications for aviation and RVR; calibration is in accordance with ICAO 9328 and traceable to a national weather service transmissometer.

General-purpose and weather station use

A versatile, well-specified visibility sensor for a wide variety of applications, including automatic weather stations and fixed visibility monitoring sites.

Standard hood heating for blowing snow

Hood heaters are fitted as standard to keep the optics clear in blowing snow. The DC-powered sensor can accept separate supplies for electronics and heaters; heating is enabled at 2 °C and disabled at 4 °C to conserve power.

Contamination monitoring & low maintenance

All windows are monitored for contamination with automatic correction and two-stage cleaning warnings, long recalibration intervals and simple field checks by a single person.

CONFIGURATION & MEASUREMENT

Visibility and EXCO output

The standard ASCII data message provides averaged MOR over the 10 m to 40 km range and EXCO; the user can select EXCO as the primary output if preferred.

Serial communication

ASCII text data is transmitted at user-defined intervals or in response to a polled request via RS232, RS422 or RS485 interfaces.

ALS-2 Ambient Light Sensor interface

An optional interface to the ALS-2 Ambient Light Sensor supports aviation applications requiring RVR. ALS-2 data is appended to the SWS-050 message, simplifying installation and data processing.

Self-test and status monitoring

Abbreviated self-test information is included in every message, with a full self-test report available on request. Advanced self-test includes contamination monitoring with automatic correction and two-stage warnings for efficient maintenance planning.

Advanced Functional Test Mode

A dedicated test mode allows user-defined visibility, contamination and fault conditions for a set period, supporting Factory and Site Acceptance Testing (FAT/SAT) and system integration checks.

- **10 M TO 40 KM MEASUREMENT RANGE**
- **SELECTABLE MEASUREMENT RESOLUTION OF 1 M OR 10 M (DEFAULT)**
- **COMPACT FORWARD SCATTER DESIGN**
- **NOT AFFECTED BY LOCAL LIGHTS**
- **EASILY INSTALLED BY ONE PERSON**
- **HOOD HEATING FOR USE IN EXTREME ENVIRONMENTS**
- **EASY INTEGRATION OF SENSECA ALS-2 AMBIENT LIGHT SENSOR**
- **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	3 WMO 4680 codes
Relay outputs	1 fault and 2 threshold relays (option)

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 and receivers window

ENVIRONMENTAL

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

PHYSICAL

Material	Aluminium. Powder coated, 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

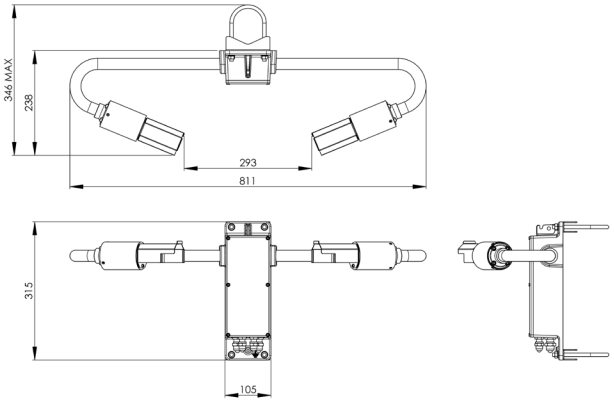
05		.HV.	J.	A.		
						Configuration RC = regular configuration SC = special configuration
					Option board NA. = without option board WA. = with ALS-2 Interface	
				Advanced self-test monitoring		
			Stadard output RS232, RS422 and RS485			
		With heating				
	Housing Blank. = powder coated aluminium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

Example: 05A.HV.J.A.NA.RC

Measurement specifications

Measures	Visibility (MOR & EXCO)	
Output	Serial data	
Range (visibility)	10 m to 40 km default. User adjustable maximum up to 40 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
Measurement resolution	1 m or 10 m (default)	
Measurement principle	Forward scatter meter with 39° to 51° angle, centred at 45°	

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 200 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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