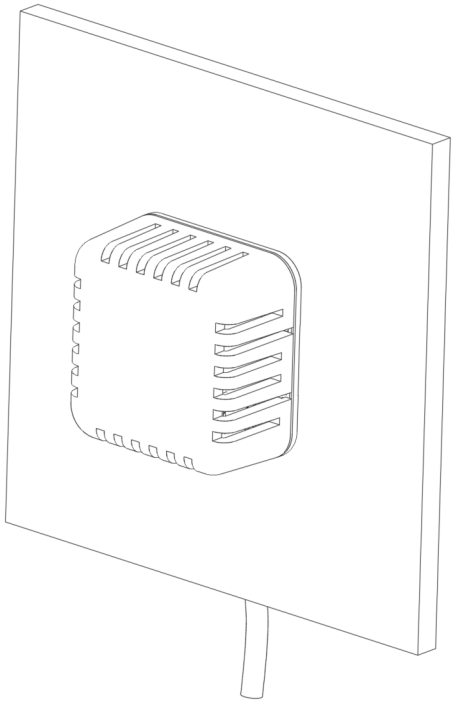
Strandnes
Embedded Solutions AB

SES-EV-2k Manual

Features



- Marine environmental sensor
- Seamless integration with standard NMEA2000 PGNs
- Easily configure the sensor
- Low power consumption
- Best in class accuracy:
  - Temperature: $\pm 0.2°C$
  - Relative humidity: $\pm 1.8\% RH$
  - Barometric pressure: $\pm 0.1 hPa$
  - Calculated dew point

Applications

- Indoor cabin environment monitoring
- Monitor individual spaces with multiple sensors

General Description

The SES-EV-2k is a high accuracy marine environmental sensor designed to directly be connected to a NMEA2000 system. SES-EV-2k offers a sleek design with no cables or screws visible, easy to install with an integrated 2 m NMEA2000 drop cable.

Multiple SES-EV-2k sensors can operate simultaneously on the same network. Each sensor can be individually configured via its USB-C port, allowing it to report temperature measurements from different locations onboard the vessel.

Specifications

All specifications are in $0°C \leq T_A \leq 65°C$ unless otherwise noted.

Parameter	Specification	Unit	Comment
Voltage	$12V$ (Max $16V$)	VDC	NMEA2000 bus power
Current	$7^{(1)}$	mA	
Operating temperature	-30-85	$°C$	Maximum
Temperature accuracy	± 0.2	$°C$	
Relative humidity accuracy	± 1.8	$\%RH$	
Relative humidity range	$0 - 100$	$\%$	
Barometric pressure accuracy	± 0.1	hPa	
Barometric pressure range	260-1260	hPa	
NMEA2000 PGNs	PGN130313 PGN130314 PGN130316		Humidity Actual Pressure Temperature, Extended Range
Mechanical dimensions	40x40x20	mm	Bulkhead/Panel mount$^{(2)}$
Drop cable length	2	m	M12-5 Male (Micro-C)
IP-Rating	IP30$^{(3)}$		IP-54 available
Case material	ABS		

[1]Based on characterization data, not tested in production.
[2]Flat wall mount option is available.
[3]According to IEC 60529 requirements.

Configuration

The SES-EV-2k supports full standard NMEA2000 device configuration. This includes configuration of the device address, device instance, and data instance using compatible NMEA2000 multifunction displays (MFDs) or network configuration tools.

In addition to standard NMEA2000 configuration, the SES-EV-2k provides extended configuration via its USB-C service port. The USB interface allows calibration, advanced parameter adjustment, and configuration for NMEA2000 networks that do not support device instance or source configuration directly from the network.

The image below shows the default plug-and-play configuration when the sensor is connected to a compatible display.



Figure 1: Out of the box measurement data shown on B&G Plotter

Important: All configuration is performed via the device's USB-C port using the supplied configuration software. The sensor must be disconnected from the NMEA2000 network during configuration to prevent communication conflicts or unintended network behavior.

PC Configuration Tool

The sensor configuration tool is used when the NMEA2000 network does not have a node with configuration capabilities. This is common in simpler systems on smaller vessels.

An internet connection is not required for the program but it is recommended. The program will check if there exists a newer version of the sensor firmware at startup and automatically update.

The following parameters can be configured via the USB configuration software:

- **Firmware Update:** The program ensures that the latest version is used.
- **Barometric Pressure Calibration:** This is required to achieve an accuracy of $\pm 0.1 hPa$.
- **Data source:** Specifies the physical location associated with the reported sensor data.

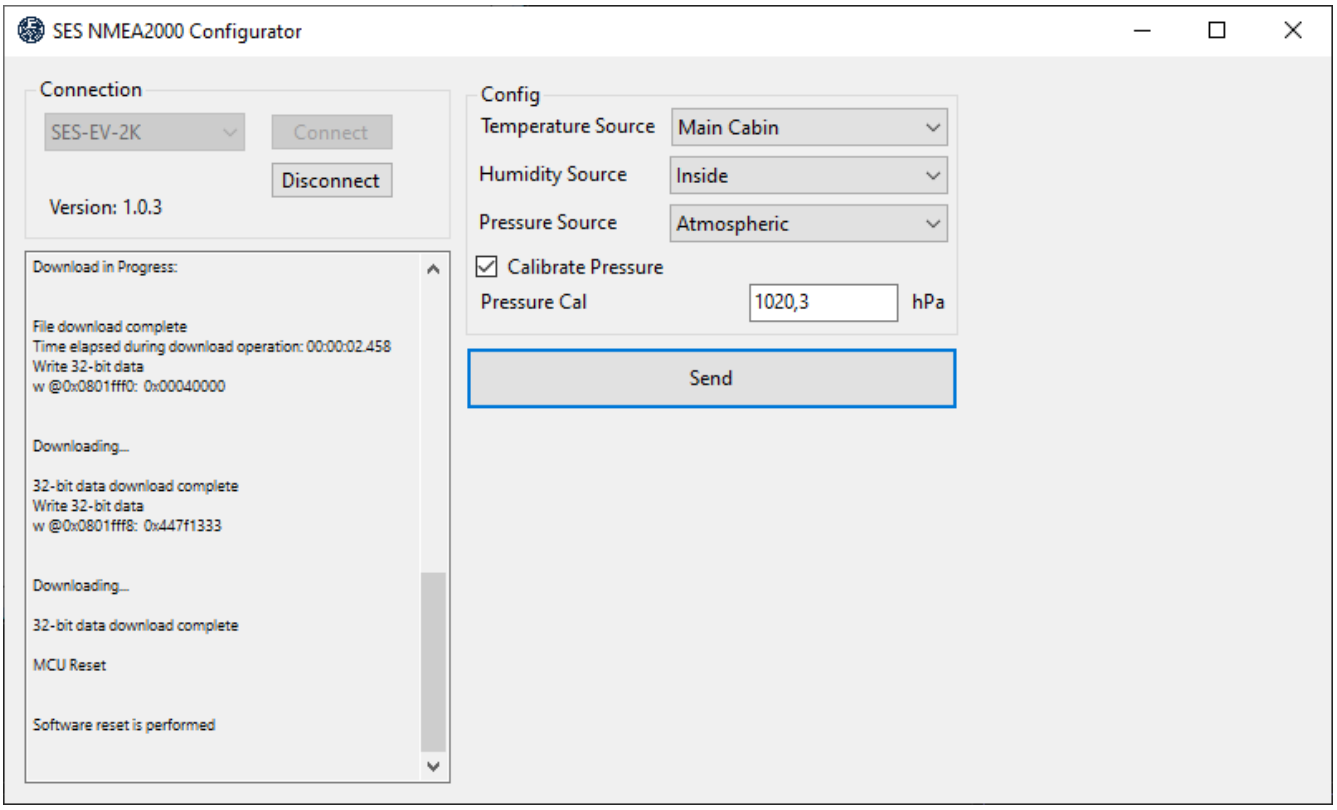


Figure 2: Configuration software user interface.

Connecting to the SES-EV-2k

Ensure that the device is disconnected from the NMEA2000 network and not connected via the USB-C port. Use tweezers or another metallic object to bridge the two "Prog Pins" located on the top-right side of the SES-EV-2k PCB.

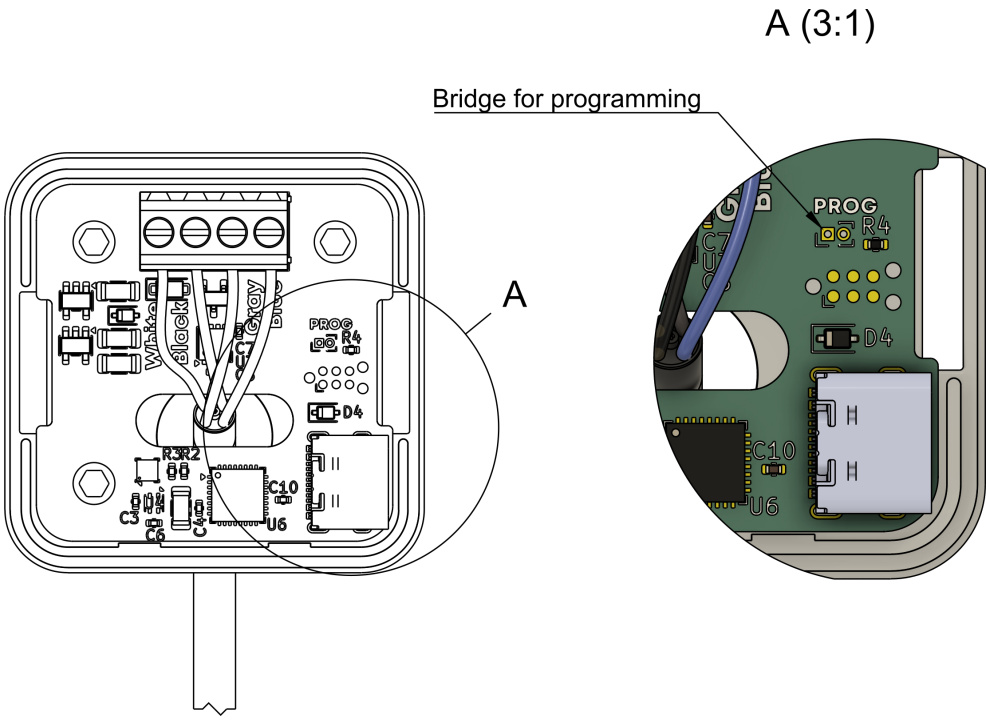


Figure 3: Entering configuration mode.

Keep the "Prog Pins" bridged while connecting the USB-C cable from the computer to the sensor. The tweezers can be removed once the computer recognizes the sensor.

Pressure Calibration

The pressure sensor is factory-calibrated against the *Swedish Meteorological and Hydrological Institute* to achieve an accuracy of ±0.1 hPa. It is recommended to recalibrate the sensor after firmware updates, failure to do so may result in reduced accuracy of up to ±1 hPa.
Calibration is performed by selecting the "Calibrate Pressure" checkbox in the configuration program and entering the current barometric pressure in hPa (reference value). It is important that the reference value has an accuracy of at least ±0.1 hPa; otherwise, the measured pressure may be less accurate than the uncalibrated state (approximately ±1 hPa).
If the accuracy of the reference value is unknown, it is preferable not to calibrate the sensor.

Mounting

The SES-EV-2k environmental sensor is designed for panel mounting with no externally visible cables or screws. Two screws are supplied to fasten the sensor to a panel, a hole $\geq$ 7mm is required to pass the cable through the panel. The sensor consists of a back plate and a clam shell. The clam shell and circuit board have to be removed when mounting the sensor to a panel. This is done by gently pressing the two sides of the clam-shell, the circuit board is attached with three screws that must be unscrew.

A case with a cable hole can optionally be ordered if passing the cable on the other side of the panel is not wanted.

NOTE
The NMEA2000 drop cable must be disconnected before opening the sensor. Failure to do so may result in electrical damage to the product or the NMEA2000 network.

Installation recommendations

- Mount the sensor in an indoor location protected from direct water spray and mechanical impact.
- Avoid mounting near strong heat sources or areas with limited air circulation.
- Do not overtighten mounting screws, as this may damage the enclosure.

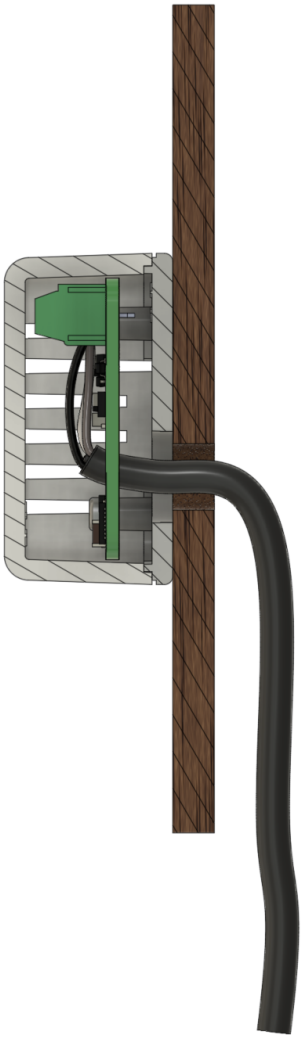


Figure 5: Panel-mounted SES-EV-2k sensor.

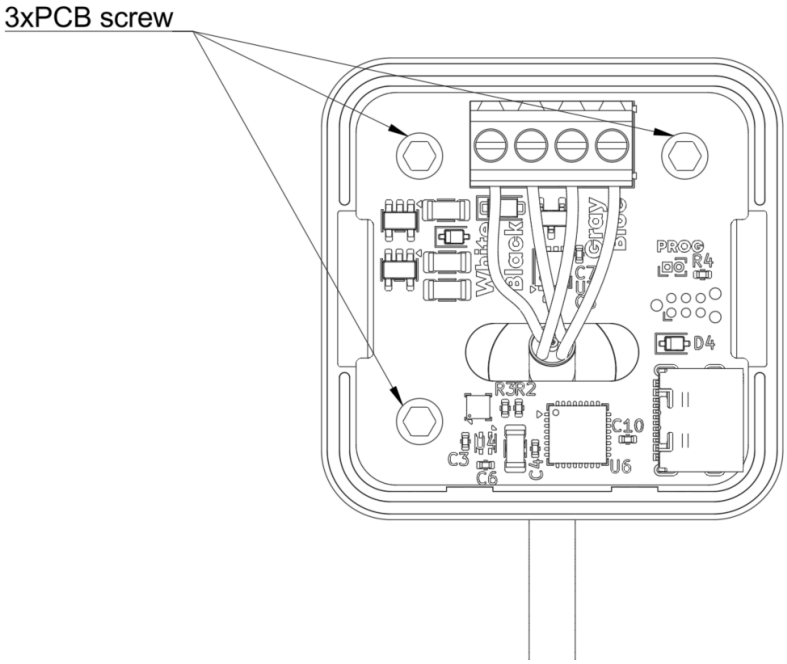
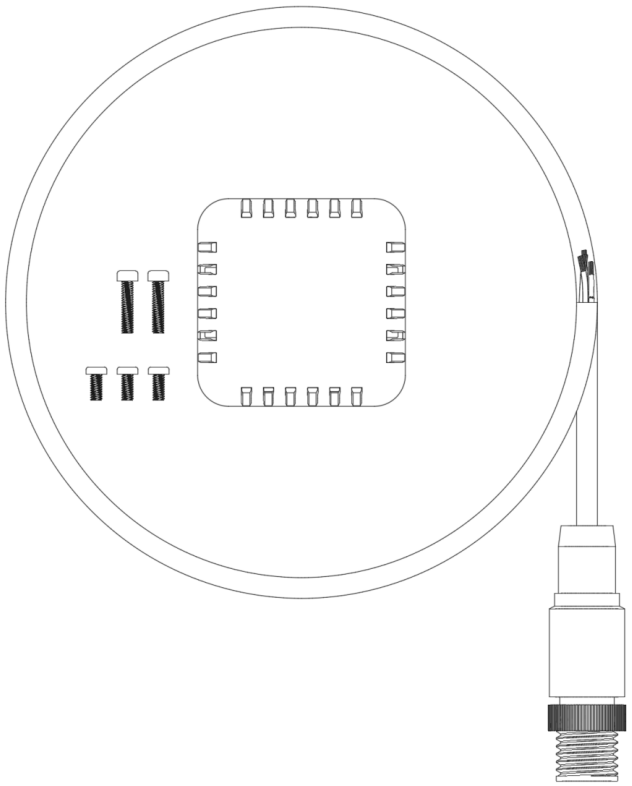


Figure 4: Location of circuit board mounting screws.

Included in package

The package contains all components required for installation and basic operation of the SES-EV-2k environmental sensor. No additional hardware is required for standard panel mounting.



QTY	Name	Comment
1	Circuit Board Assembly	Pre-assembled PCB with electronics
1	Enclosure	Two-piece housing: back plate and clam-shell
1	NMEA2000 Drop Cable	2 m M12-5 male (Micro-C) cable
2	Mounting Screws	4×14 mm, stainless steel (AISI 316)
3	PCB Screws	2.2×5 mm, (FZB)

Table 1: Included components

Warranty

Strandnes Embedded Solutions AB warrants that the product is free from defects in materials and workmanship and will function as intended under normal use for a period of one (1) year from the date of purchase.
If a defect arises during the warranty period, Strandnes Embedded Solutions AB will, at its discretion, repair or replace the product at no cost to the customer. Any repaired or replaced product will be covered for the remainder of the original warranty period.
This warranty does not apply to damage resulting from misuse, mishandling, improper installation, unauthorized modification, or physical damage, including damage caused by exposure to conditions outside the specified environmental limits.
This warranty is provided in addition to, and does not affect, the customer's statutory rights under applicable EU consumer protection laws. Furthermore, this warranty does not limit or restrict any rights the customer may have under the Swedish Consumer Sales Act (Konsumentköplagen (2022:260)), or the Sale of Goods Act (Köplagen (1990:931)).

Dispute

Any disputes relating to this warranty or to any associated rights shall be subject to the exclusive jurisdiction of Swedish courts. Unless a specific consumer right under EU law is invoked, Swedish law shall govern any dispute arising in connection with this warranty.

Disclaimer

This product is designed to assist navigation and environmental monitoring and must not be relied upon as the sole means for navigation. The user is responsible for the correct installation, configuration, and use of this product in accordance with the manufacturer's instructions.
Strandnes Embedded Solutions AB does not accept responsibility or liability for any damage to property, personal injury, or loss resulting from improper installation, misuse, or reliance on this product beyond its intended purpose.
Strandnes Embedded Solutions AB products may be updated or modified. As a result, the product supplied may differ in appearance, functionality, or performance from the descriptions and illustrations contained in this manual.

Revision History

Date	Version	Pages	Changes
January 2026	1	All	Initial release
February 2026	1.0.1	8	Legal text
April 2026	1.0.2	3	Improved configuration text

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