

ENV-STD-LR-1, version 1.0

Environmental Sensor

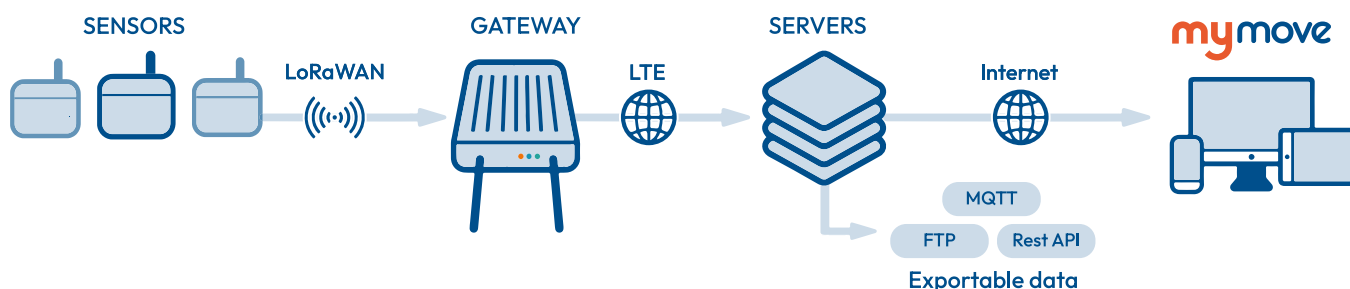
The Environmental Sensor is a wireless sensor that can measure a variety of parameters such as particulate matter, environmental noise, and a wide range of weather-related parameters for an all-round understanding of the environment around it.

KEY FEATURES

-  Affordable 3-in-1 particulate, weather, and noise station
-  For indoor and outdoor operation
-  Compatible with external 12–24 VDC (nominal) power supplies for extended operation
-  Battery operation for fast deployment
-  Wireless LoRaWAN connection
-  Fully remote configuration and management
-  Low Power and Always On modes for optimal battery life management
-  Noise parameters expressed using terminology and definitions consistent with the corresponding parameters described in IEC 61672-1, where applicable
-  PM₁, PM_{2.5}, PM₄ and PM₁₀ measurements with instantaneous, average, and maximum values and trigger mode
-  Wind direction and speed measurement with instantaneous, average, and maximum values and trigger mode (*external probes required*)
-  Rainfall measurement with instant and total values and trigger mode for geohazard applications (*external probe required*)
-  Data management and processing through MyMove platform

Its design ensures quick and easy installation, significantly reducing time and costs. The sensor is optimized for a long operating life, which can be further extended by adjusting the

sensor configuration. To operate, the sensor requires a Move Solutions Gateway installed nearby.





Agents

The Environmental Sensor is made up of three **agents** that behave as three independent sensors.

The **Noise agent** measures environmental noise using a microphone. It provides acoustic output parameters such as L_{eq} over several selectable time windows, as well as L_{max} , L_{pk} , L_{10} , L_{50} and L_{90} . These parameters are expressed with A or C frequency weighting and, where applicable, with F or S time weighting. The terminology and definitions used for these output parameters are consistent with the corresponding parameters described in IEC 61672-1¹, where applicable. Statistical descriptors such as L_{AF10} , L_{AF50} , L_{AF90} , L_{CF10} , L_{CF50} and L_{CF90} are calculated from the corresponding A- or C-weighted, Fast time-weighted sound level values.

The power-efficient microphone allows for up to 4 weeks of continuous monitoring on batteries alone, or an external power supply can be connected for long term monitoring.

The **Air agent** outputs data on particulate matter in the air: instantaneous mass concentration of PM_1 , $PM_{2.5}$, PM_4 and PM_{10} can be measured in Low Power mode, while Always On mode allows the user to collect data on the maximum and average mass concentration of particulates in the air and set acquisitions to trigger when the instantaneous mass concentration

exceeds a threshold. To maximize insight on these parameters the agent collects data on atmospheric pressure, ambient temperature and relative humidity, and an external tipping bucket rain probe can be connected to measure instantaneous and total rainfall. A threshold can be set to trigger an acquisition when the total rainfall over a specified time exceeds a user-defined threshold.

The **Wind agent** takes measurements from two external Wind speed and Wind direction probes. The Low Power mode consists of programmed reading of instantaneous speed and direction, with cadence ranging between 2 minutes and 24 hours.

A more power-hungry Always On mode enables the user to also measure average and maximum wind speeds, as well as enabling a trigger mode on instantaneous wind speed.



¹ This product is not certified as compliant with the IEC 61672 series. The output parameters are nevertheless expressed using terminology and definitions consistent with the corresponding parameters described in IEC 61672-1, where applicable.

Technical specifications

NOISE AGENT		
Technology	MEMS	
Resolution	0.01 dB _{SPL}	L _{Aeq} , L _{Ceq} , L _{AFmax} , L _{CFmax} , L _{ASmax} , L _{CSmax} , L _{Apk} , L _{Cpk}
	1.0 dB _{SPL}	L _{AF10} , L _{AF50} , L _{AF90} , L _{CF10} , L _{CF50} , L _{CF90}
Accuracy (1 kHz, 94 dB _{SPL})	±0.5 dB _{SPL}	
Sampling frequency	48 kHz	
Output parameters	• L_{Aeq} over the selected evaluation window • L_{Ceq} over the selected evaluation window • L_{AFmax} since last communication • L_{CFmax} since last communication • L_{ASmax} since last communication • L_{CSmax} since last communication • L_{Apk} since last communication • L_{Cpk} since last communication • L_{AF10} since last communication • L_{AF50} since last communication • L_{AF90} since last communication • L_{CF10} since last communication • L_{CF50} since last communication • L_{CF90} since last communication	
Cadence (communication period)	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours	
Evaluation window	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours	

AIR AGENT		
Cadence (communication period)	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours	
Particulate matter		
Technology	Laser scattering	
Range	0–1000 µg/m ³	
Size range	PM ₁	0.3–1.0 µm
	PM _{2.5}	0.3–2.5 µm
	PM ₄	0.3–4.0 µm
	PM ₁₀	0.3–10.0 µm

AIR AGENT

Particulate matter

Accuracy (PM ₁ and PM _{2.5})	Reading < 100 µg/m ³	±(5 µg/m ³ + 5% of reading)
	Reading > 100 µg/m ³	±10% of reading
Accuracy (PM ₄ and PM ₁₀)	Reading < 100 µg/m ³	±25 µg/m ³
	Reading > 100 µg/m ³	±25% of reading
Resolution	0.1 µg/m ³	
Output parameters (Low Power mode)	Instantaneous PM ₁ , PM _{2.5} , PM ₄ and PM ₁₀	
Output parameters (Always On mode)	- Instantaneous PM₁, PM_{2.5}, PM₄ and PM₁₀ - Maximum PM₁, PM_{2.5}, PM₄ and PM₁₀ since last communication - Average PM₁, PM_{2.5}, PM₄ and PM₁₀ over the selected evaluation window	
Threshold resolution (Always On mode only)	10 µg/m ³	
Evaluation window	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours	

Rain (external probe required, see *Ordering information*)

Technology	Tipping bucket	
Resolution ¹	0.2 mm	
Accuracy	±4% (at 2 mm/min)	
Output parameters	- Rainfall since last communication - Total rainfall over the selected evaluation window	
Evaluation window	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours	
Threshold resolution	Same as Resolution. Threshold is applied to the total rainfall over the selected evaluation window.	

Atmospheric pressure

Resolution	0.01 hPa
Accuracy	±0.5 hPa
Range	0–1250 hPa
Output parameters	Instantaneous atmospheric pressure

Temperature

Resolution	0.01 °C
Accuracy	±0.7 °C
Output parameters	Instantaneous ambient temperature

Relative humidity

Resolution	0.01 %RH
Accuracy	±6 %RH (30–70 %RH)
Output parameters	Instantaneous relative humidity

¹ These values are based on the rain probe provided by Move Solutions as an accessory. Other rain probes may differ.

WIND AGENT (external probes required, see *Ordering information*)

Technology	External 4–20 mA wind direction and wind speed sensors
External sensor supply voltage	12.3 VDC $\pm 2\%$ (70 mA)
Supported analog interface	4–20 mA (3 wires)
Range	0.4–25 mA
Resolution	0.001 mA
Accuracy of readout	± 0.03 mA
Accuracy of wind speed sensor	± 0.3 m/s
Accuracy of wind direction sensor	$\pm 3^\circ$
Output parameters (Low Power mode)	- Instantaneous wind speed (3 seconds average) - Instantaneous wind direction
Output parameters (Always On mode)	- Instantaneous wind speed (3 seconds average) - Instantaneous wind direction - Average wind speed over the selected cadence time - Maximum wind speed since last communication
Cadence (communication period)	2 minutes, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 6 hours, 8 hours, 10 hours, 12 hours, 14 hours, 16 hours, 18 hours, 24 hours
Threshold resolution (Always On mode only)	0.1 mA

GENERAL DATA

Wireless connection technology	Sub-GHz LoRaWAN protocol ¹ (Gateway required)
Wireless coverage ²	1 km line of sight from the nearest Gateway
Internal storage	- Up to 10000 Air agent events <i>or</i> - Up to 14000 Noise agent events <i>or</i> - Up to 24000 Wind agent events
Cable connections	- Move Link (Move Solutions 8-pole connector) 4× 4-pole connectors (wind direction, wind speed, rain connectors and external power connector) For compatible accessories visit Move Solutions' website or contact us directly
Internal batteries	2× 19 Ah, 3.6 V replaceable lithium batteries (Suggested: EVE ER34615PHR4)
External power	12–24 VDC (nominal) Minimum voltage: 11 VDC Maximum voltage: 28 VDC
Maximum required power from external power supply	900 mW

¹ The sensor's LoRaWAN connection operates on a best-effort basis, which means that while most data packets are delivered, there is a slight possibility of occasional packet loss.

² Wireless coverage may vary based on the actual deployment scenario.

GENERAL DATA

Operating range	0–90 %RH (non-condensing) -10 to +50 °C
Storage conditions	0–80 %RH (non-condensing) -40 to +70 °C
Dimensions ¹	228 × 207 × 71 mm
Weight ¹	1.5 kg
Case material	Polycarbonate
Microphone material	Anodized aluminum
Installation options	Wall or pole mount
Software version	v1

¹ Refers to the sensor unit itself. External accessories, such as mounting plate, external connectors and probes are not included since they are optional and/or can be replaced with alternative parts to fit specific applications.

BATTERY LIFE

Noise agent <i>Noise channel</i>	Wind agent <i>Wind speed and direction channels</i>	Air agent <i>Air quality channel</i>	Expected duration ²
ON Any cadence	OFF	OFF	1 month
OFF	Low Power mode ³ Cadence 30 minutes	OFF	2 years and 8 months
OFF	Low Power mode ³ Cadence 2 minutes	OFF	10 weeks
OFF	Always On mode ³ Any cadence	OFF	8 days
OFF	OFF	Low Power mode Cadence 30 minutes	1 year and 4 months
OFF	OFF	Low Power mode Cadence 10 minutes	5.5 months
OFF	OFF	Always On mode Any cadence	7 days
ON Any cadence	Low Power mode ³ Cadence 30 minutes	Low Power mode Cadence 30 minutes	1 month
OFF	Low Power mode ³ Cadence 30 minutes	Low Power mode Cadence 30 minutes	1 year
ON Any cadence	OFF	Always On mode Any cadence	6 days
ON Any cadence	Always On mode ³ Any cadence	OFF	6 days
ON Any cadence	Always On mode ³ Any cadence	Always On mode Any cadence	3 days

² The expected battery life is only an estimate and can vary depending on a variety of environmental factors.

³ Power consumption of the Wind agent is directly affected by the output of the wind probes. Estimates in this table are based on an above-average use case with the probes included in the official bundles. In extreme cases, battery duration might be reduced.

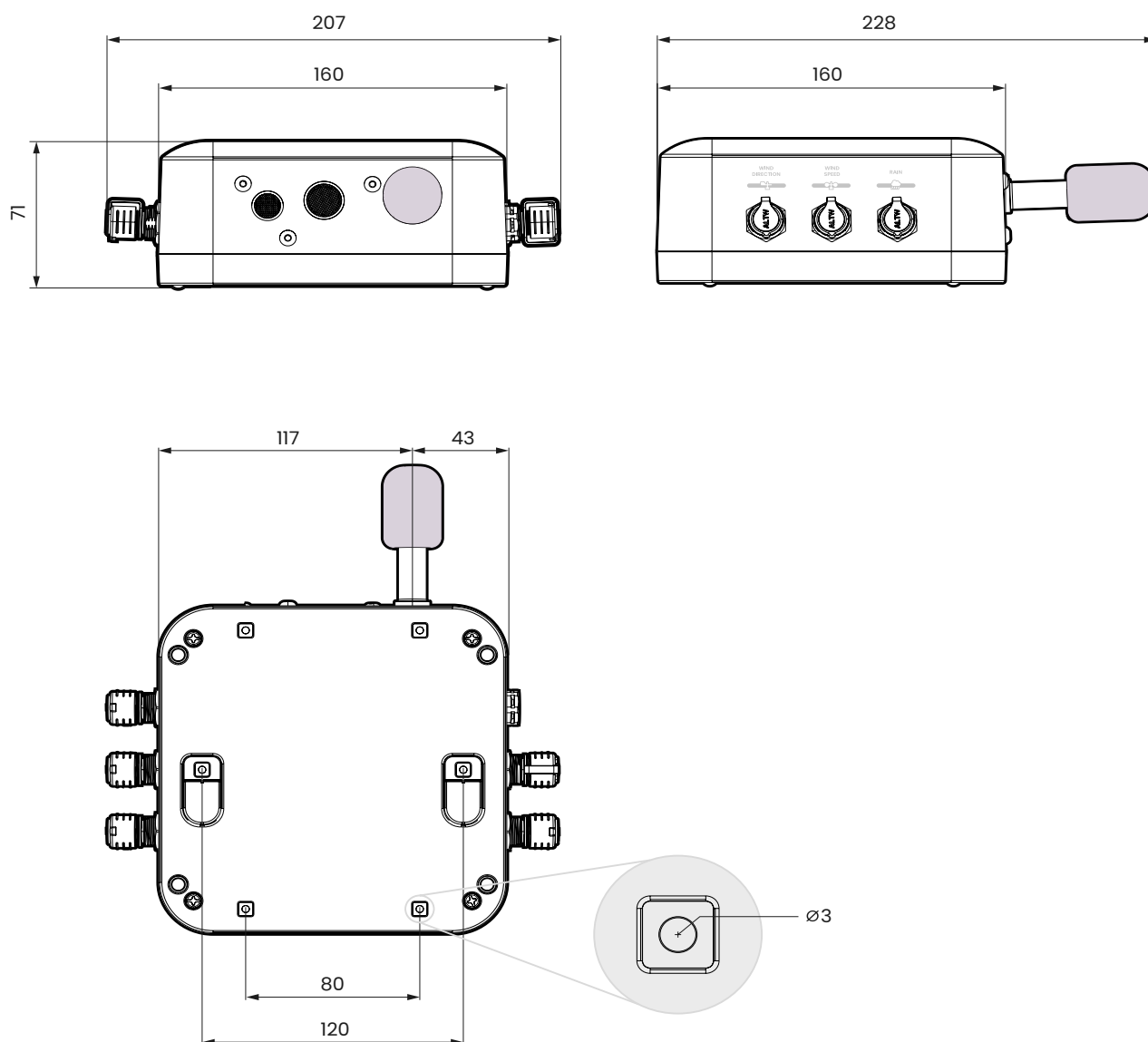
ORDERING INFORMATION

SENSOR BUNDLES	PART NUMBER
Environmental Sensor standard bundle <i>Includes: sensor unit, pole mount kit for sensor unit</i>	ENV-BND-STD-1
Environmental Sensor rain bundle <i>Includes: sensor unit, rain probe, pole mount kit for sensor unit and probe</i>	ENV-BND-R-1
Environmental Sensor wind bundle <i>Includes: sensor unit, wind speed and direction probes, pole mount kit for sensor unit and probes</i>	ENV-BND-W-1
Environmental Sensor rain and wind bundle <i>Includes: sensor unit, rain probe, wind speed and direction probes, pole mount kit for sensor unit and probes</i>	ENV-BND-RW-1
ACCESSORIES	PART NUMBER
Battery Pack	SBE-STD-CB-1
Data download cable	SCM-STD-CU-1
External connectors kit (for probes cabling)	ENV-CON-4PF-1
Microphone windscreen (replacement)	ENV-MIC-WSC-1
PM air filters (replacement)	ENV-PM-FIL-1

Mechanical drawings

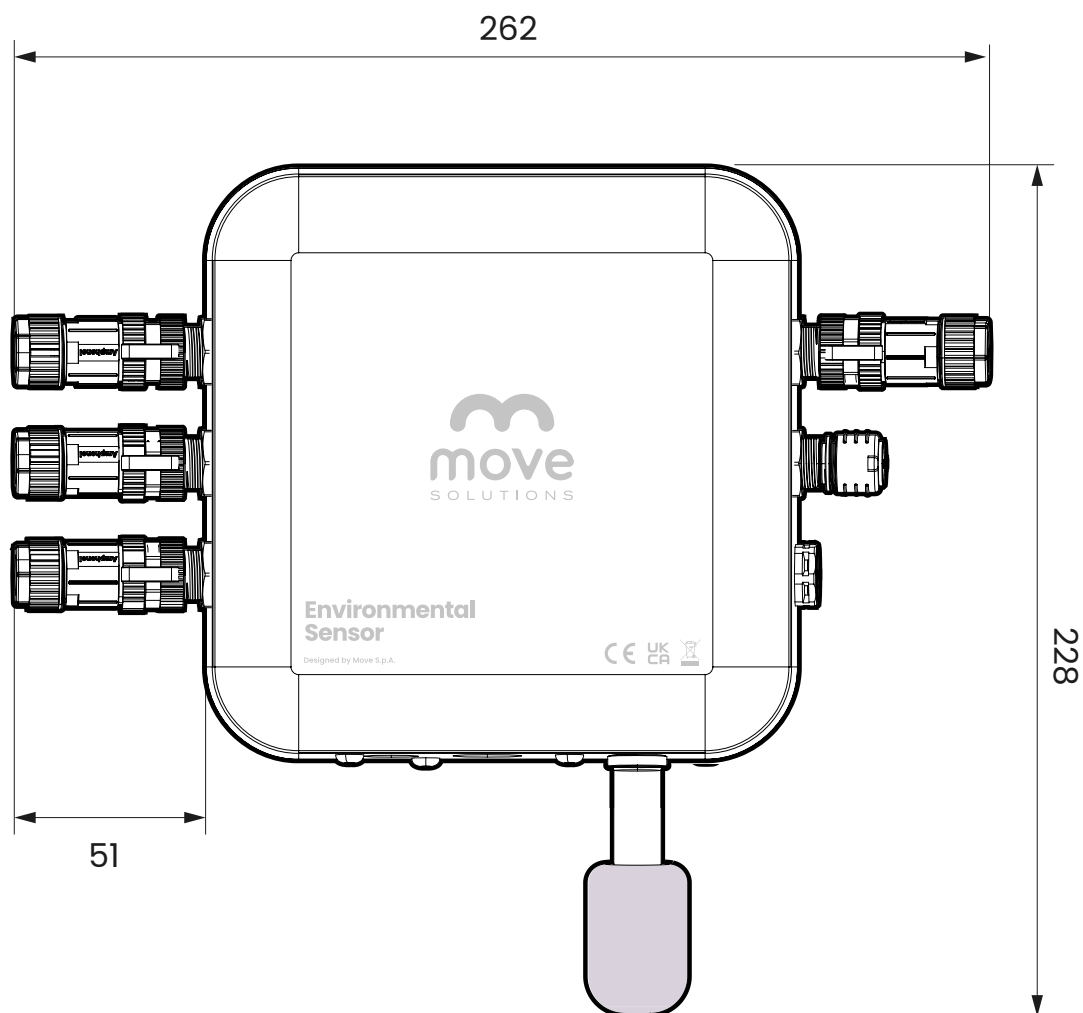
WITHOUT CONNECTORS

All dimensions are in millimeters



MAXIMUM WIDTH WITH CONNECTORS

All dimensions are in millimeters



For complete information regarding proper use of the device, safety precautions, installation, operation, and maintenance requirements, users must refer to the official product manual.

DOCUMENT REVISIONS		
N°	DATE	NOTES
REV. 1	26 November 2024	Initial release
REV. 2	10 December 2024	Text corrections and ordering information update
REV. 3	3 January 2025	Company information update and minor text correction
REV. 4	6 February 2025	Technical specifications update and document layout revision
REV. 5	11 April 2025	Battery duration estimates and ordering information update
REV. 6	8 July 2026	Complete template and style update; specifications and ordering information update

Notice of publication

The information contained in this document may be subject to change without notification. For more detailed information, product specifications and to download up-to-date documents, visit our website at www.movesolutions.it.