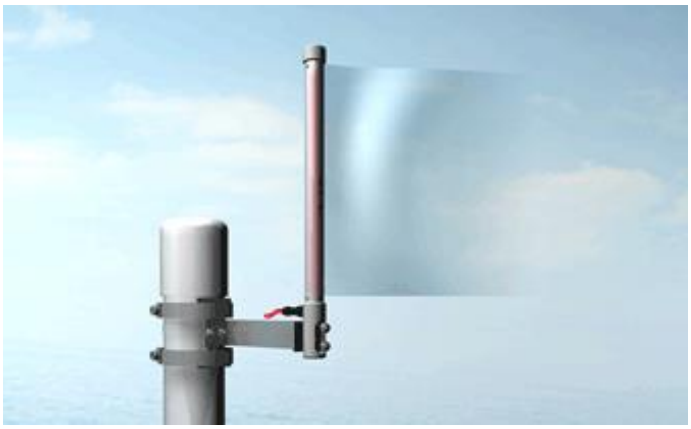
WindFlow WF4

Extreme Winds Monitoring Sensor

GENERAL DESCRIPTION

The WindFlow WF4 sensor is an unbreakable, hurricane-resistant wind-speed instrument.



- It is an ultra-robust, very low-power, maintenance-free and totally sealed acoustic instrument with no mobile parts.
- The sensing part of the instrument is a cylindrical, anti-abrasion, anti-adhesion stainless steel tube supported by one extremely strong stainless steel arm.
- Wind laminar air friction induces change in internal acoustic pressure. The excitation is converted into a wind speed signal as a result of a specific acoustic, mechanical and electronic design.
- The instrument includes a dedicated analog conditioning module, a digital I/O module and an analog restitution module that can be connected conveniently to almost any external central unit (data logger, industrial module interface, instrumentation DAQ, USB port). It features continuous or pulse analog voltage outputs, SDI-12 communication (meteorological standard communication protocol); serial RS-232, RS-485 (with adaptor).
- You can customize the full configuration of the sensor, in a non-volatile memory, with a Plug-and-Play computer connection thanks to a universal USB dongle accessoryprovided with the sensor.

KEY FEATURES

- Maintenance-free & special design and construction to resist the highest winds, extreme temperatures, rime, sunlight and abrasion.
- Lightweight, corrosion free, UV/Ozone stable, non-obstructable. Resistant to shock, vibration, lightning, ashes, 100% RH and even to temporary submersion. Operating temperature from −40 °C to 80 °C (−50 °C to 100 °C extended).
- Plug-and-Play or totally configurable to fit any application.
- Very low power consumption: 2.1 mA continuous for a nominal operation (10% duty-cycle).
- Adaptable to any structure thanks to a range of very high standard stainless steel clamping accessories.
- Directly connect the sensor to your central unit or configure any analog or digital communication through the USB dongle accessory.
- IoT compatible.
- Possibility to connect the sensor with a very long cable (typ. up to 150 m) with very high information robustness and under very low current drain, thanks to the SDI-12 multi-drop interface, or using an RS485 adapter.

TYPICAL APPLICATIONS

- Wind speed monitoring of strong winds and hurricanes
- Surveillance of high wind areas
- Securisation of high-voltage lines
- Meteorological, industrial, and scientific applications
- Railway surveillance

Highly exposed weather stations
Marine
Road, rail and cable transport
Industrial installations
Agriculture

SPECIFICATIONS

SETTINGS POSSIBILITIES

Wire	Signal	User selectable	Plug and Play default factory settings
White	Power	No	Positive power supply (6 to 30) VDC
Brown	Signals GND	No	OUT1 GND, OUT2 GND and SDI-12 GND
Green	OUT1	1. Disabled 2. Wind speed (Persistent, +0V to full-scale +2.5V or +5V)	2. Wind speed, persistent, +0V to +5V
Yellow	OUT2	1. Disabled 2. Wind speed (Persistent, +0V to full-scale +2.5V or +5V) 3. Raw signal (±2.5V) (Note: direct, unfiltered AC output of the sensor)	1. Disabled
Blue	SDI-12	1. Disabled 2. Wind speed	4. SDI 12 bus active, address: 0, Wind speed
Grey	RX	1. Disabled 2. Wind speed	4. RS-232 active, Wind speed
Pink	TX		
Black	Power GND (0V)	No	Power GND (0V)

MAXIMUM RATINGS

Voltage ranges and measuring scales	
Voltage outputs	Continuous analog voltage or pulse analog voltage, user selectable +0 to +2.5V or +0 to +5V are available. Pulse threshold, integrator timeout and duration are also user selectable. The continuous analog voltage persists on the outputs so that output voltages can be read at any time.
Wind speed scaling	Sensitivity @voltage range +2.5V: [7 mV/(km/h)] i.e. +2.5V corresponds to 357 km/h Wind speed detection threshold: about 10 m/s (below this wind speed, the sensor's response is not reliable)
	Sensitivity @voltage range +5V: [14 mV/(km/h)] i.e. +5V corresponds to 357 km/h Wind speed detection threshold: about 10 m/s (below this wind speed, the sensor response is not reliable)

POWER SUPPLY

Supply	Ratings
Voltage	6 V to 30 V DC (9.6 V and 16 V DC in case of powering through the SDI-12 terminals)
Current	< 1 mA in stand-by mode and 20 mA max in acquisition mode. For a typical nominal duty-cycle of 10%: 2.1 mA (20 mA for duty-cycle of 100%).

ADDITIONAL INFORMATION

■ All ISAW sensors are ultra-robust, high performance sensors for environmental monitoring. Their construction with no mobile parts makes them ideal for a wide range of meteorological, industrial and scientific applications even in the harshest environments. The ISAW Catalogue lists all available ISAW equipment and the ISAW User Guide provides all the required information and instructions to operate the sensors.

■ The sensors can simply be used by reading DC outputs (+0 to +2.5V or +0 to +5V continuous or pulse analog voltages available). Note that the continuous DC analog voltages are persistent on the outputs so that output voltages can be read at any time (the reading interval from your peripheral is independent from the duration of the time integration of the sensor).

■ The USB dongle accessory and the ISAW-toolbox software suite allow you to get introduced to the sensor by immediately establishing a connection with a computer or laptop, realizing a quick and simple communication start test, accessing all settings menus and seeing live data with a simple scope utility. You also have permanent access to the configuration and communication setups of the sensor directly in a terminal console mode. Remote access is also possible using other standard serial communication modes (RS232, RS 485 or extended SDI-12 commands).

■ Configuration includes measuring settings (e.g. averaging durations), power settings, communication and mapping settings (e.g. analog and/or digital outputs, voltage scales, duty-cycle, bus address, etc.). Following the instructions in the ISAW User Guide you can adapt the default configuration at any time to almost any mode of use. The sensors are compatible with both analog and/or digital peripherals. The default configuration, as well as any other customized configuration, is non-volatile, ensuring that your sensor remains in the desired operating configuration whatever the powering scenarios. Thus, even in case of repeated power failures, the sensor will always restart automatically in the desired configuration mode.

■ When adding or replacing an ISAW sensor, it is possible to pre-configure it in order to achieve Plug and Play functionality without any on-site configurations. The sensor is totally stand-alone, so that the full lifetime operation of the sensor on your installation doesn't require any software installation or maintenance.

■ When choosing an SDI-12 interface for your sensor, you can configure the data frame content you need, set the sensor address of your choice, connect more than one ISAW sensor (as well as other SDI sensors) to a single data recorder and use extension cables up to typically 150 m with a very low current drain.

SOFTWARE

■ For advanced use requiring a customized setting of the sensor, or simply to adjust some factory default settings (e.g. changing voltage range, pulse duration, SDI address, etc.), the non-intrusive and standalone freeware ISAW-Toolbox allows you to immediately configure the sensor exactly to your needs and load this configuration permanently in the non-volatile memory of the sensor.

■ Free download the ISAW-Toolbox software suite at www.isaw-products.com. Connect the sensor to your computer using the USB dongle accessory. The USB dongle has an 8-pin quick connector for the sensor's wires, a built-in power converter, and a USB plug for direct connection to a Windows, Linux, or Mac OS machine.

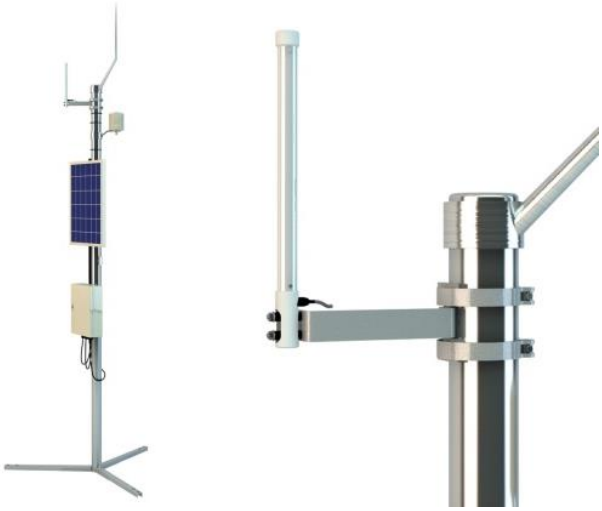
GENERAL CONDITIONS

ORDERING & SHIPPING

The WindFlow WF4 sensor is available with or without mounting kit. The different mounting kits, as well as a range of complementary spare parts and accessories, allow you to select the equipment that perfectly matches your operating situation. A complete list of references and descriptions is available in the *ISAW Catalogue*.

ORDER REF.	Description
WF4	WindFlow sensor only
WFBRA	WindFlow sensor with mounting kit
WFMAS	WindFlow sensor fastened on a tripod mast

Worldwide shipping within 2-5 days a.r.o. in a wood-free cardboard box.



CONDITIONS OF USE

Always remember that ISAW sensors are acoustic instruments and could thus potentially be affected by structure-borne vibrations issuing from the supporting structure (for example, a steel cable impacting repetitively on a metal mast when subjected to wind); or to a lesser extent by parasitic low-frequency noise from the immediate environment (for example, excessive proximity to heavy traffic or machinery could lead to parasitic signals). It is recommended that you pay attention to avoiding possible parasitic noise when mounting the project.

DISCLAIMER

When using ISAW sensors, IAV Technologies SARL is not responsible for the choice, selection, relevance and usage appropriateness of the sensor's installation site; nor for the usage, interpretation, and extrapolation of the information made available to the users. Any known system issues that may induce dysfunction or skew the measurements are reported to the users through documentation updates. To continually improve the system, the ISAW Products division of IAV Technologies SARL reserves the option to continuously evolve the sensor's hardware, software, and user recommendations.

WARRANTY

Two-year warranty. The sensor, the USB dongle accessory and the mounting accessories are designed and produced with the highest standards. The equipment has a total of more than 100 mechanical and electrical spare parts and 250 electronic components. In case of failure, DO NOT TRY to open the sensor. Opening is destructive unless it is done at the factory for repair. None of the moving or user-serviceable parts require routine maintenance. Opening the unit will void the warranty. In the event of failure, before returning the unit, we recommend that you:

1. Check all cables and connectors for continuity, bad contacts, corrosion, etc.
2. Conduct a bench test e.g. using the Scope utility.
3. Contact us directly for advice.