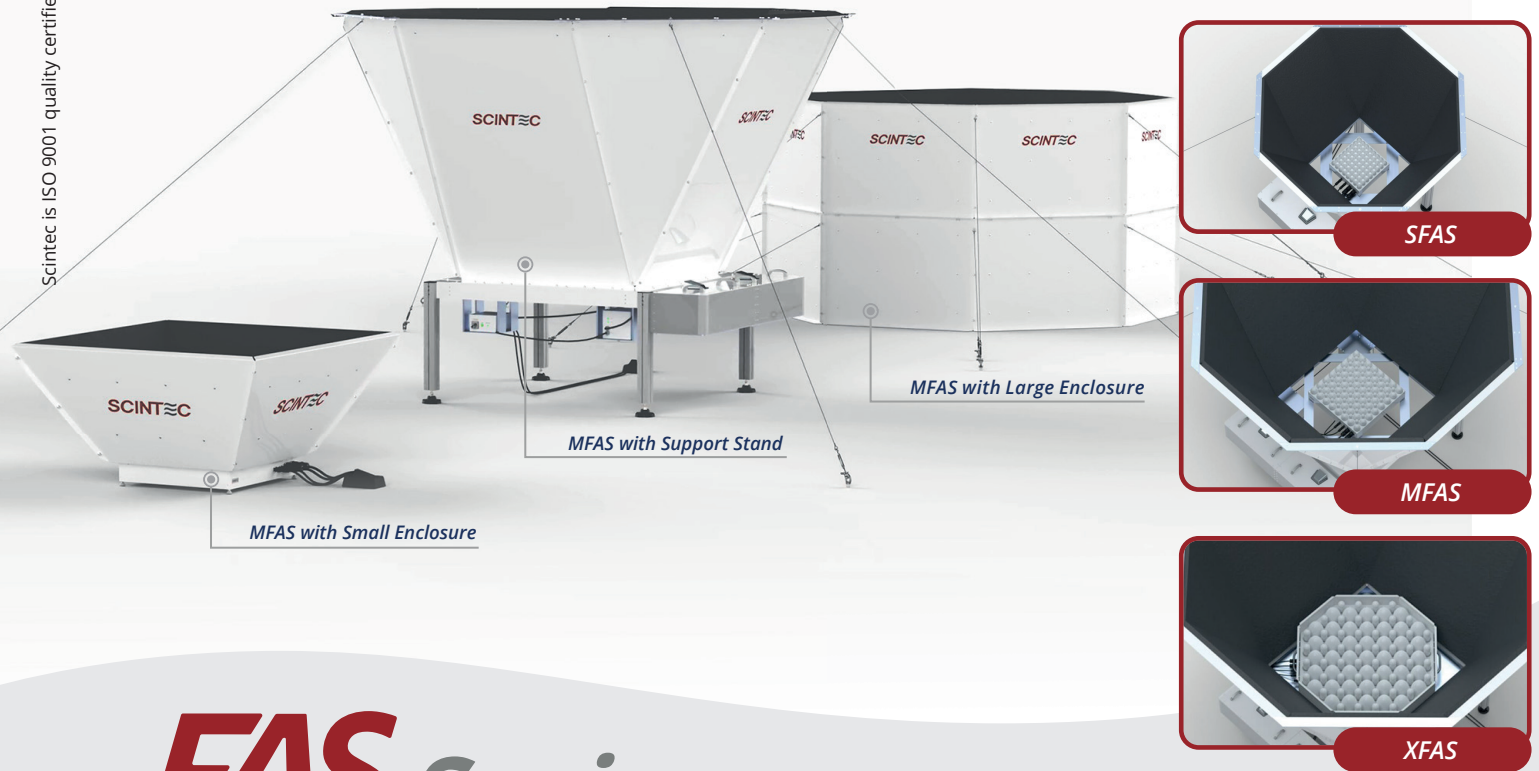


# ACOUSTIC WIND PROFILERS

Scintec is ISO 9001 quality certified



## FAS Series

### Features

- Vertical profiles of wind speed and direction in the lower atmosphere
- Vertical resolution down to 5 to 20 m
- Compact and lightweight models available
- RASS Extensions available
- Multi-frequency technology (sequential and polyphonic)
- Simultaneous multi-beam technology
- Automated self-test
- Low noise-emission with active tapering
- Various remote access options available

### Applications

- Micrometeorology
- Air quality
- Atmospheric dispersion
- Nuclear power plant safety
- Wind energy
- Urban climate
- Optical propagation studies
- Defense
- Airport safety
- Fog forecasting

**SCINTEC**

# FAS Series

## ACOUSTIC WIND PROFILERS

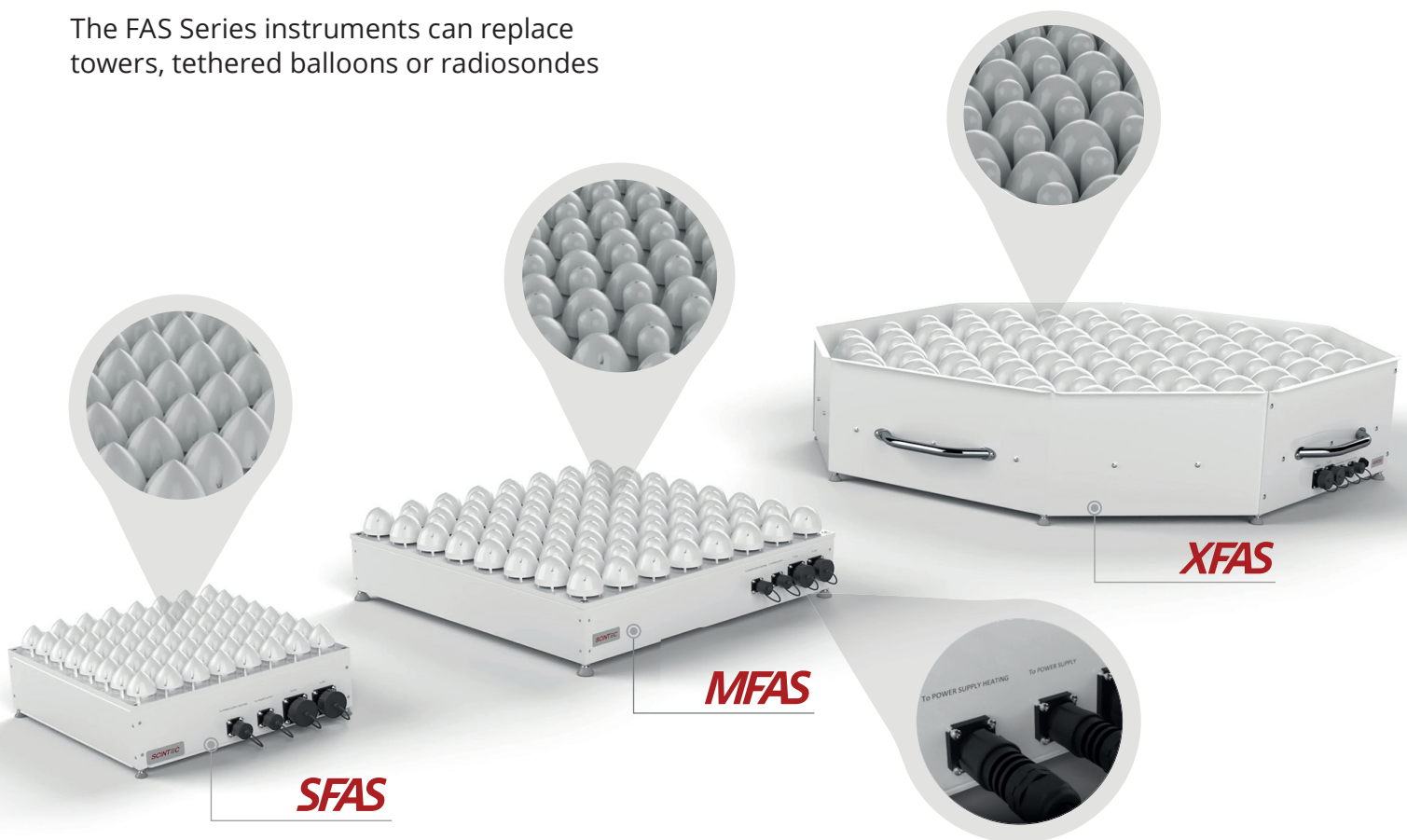
The Scintec **FAS Series** Sodar Wind Profilers measure wind and turbulence within the atmospheric boundary layer. The operating principle is based on the reflection of acoustic pulses from temperature inhomogeneities in the air with subsequent Doppler analysis of the backscattered signal.

With the proprietary Flat Array Antennas and a simultaneous multi-beam, multi-frequency operation, the FAS Series Sodars have significant advantages in accuracy, data availability and energy efficiency.

The FAS Series instruments can replace towers, tethered balloons or radiosondes

at a fraction of the operational costs. With their small size, the systems can be easily transported and installed. The low power consumption also allows the unattended operation in remote areas.

With the choice of three models SFAS, MFAS and XFAS covering different height ranges and with various acoustic enclosure options, the FAS Series Sodar Wind Profilers offer a tailored solution for any wind profiler application in the lower atmosphere.

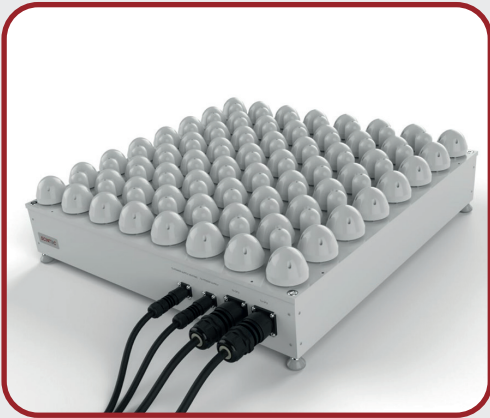


## MODELS



### ***Flat Array Sodar SFAS***

The Scintec SFAS is a very compact acoustic profiler for the measurement of wind and turbulence up to 500 m above the ground. It provides the highest spatial resolution among the FAS series. SFAS can be further upgraded by RASS Extensions (RAE2 and windRASS) for precise measurements of temperature profiles.



### ***Flat Array Sodar MFAS***

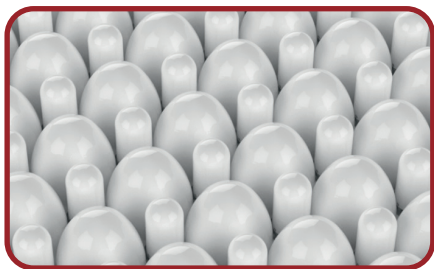
The Scintec MFAS is a versatile acoustic profiler for the measurement of wind and turbulence up to 1000 m above the ground. It combines the advantages of an excellent portability and a large vertical measurement range. MFAS can be further upgraded by RASS Extensions (RAE2 and windRASS) for precise measurements of temperature profiles.



### ***Flat Array Sodar XFAS***

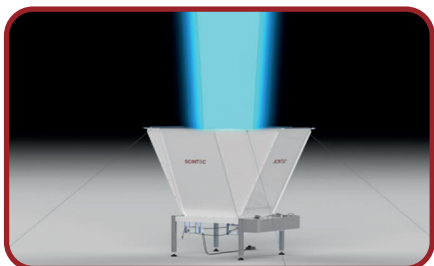
The Scintec XFAS is a high-performance, long-range acoustic profiler for the measurement of wind and turbulence within the atmospheric boundary layer. XFAS can be further upgraded by the RAE2 RASS Extension for precise measurements of temperature profiles.

# COMPETITIVE ADVANTAGES



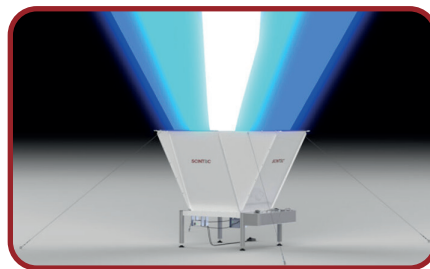
## Flat Array Antenna

The Flat Array Antennas of the FAS Series Sodar Wind Profilers consist of a novel phased-array arrangement of inverse-horn transducers which were specifically developed for acoustic antennas. The inverse-horn design improves the impedance match with the atmosphere, achieving highest acoustic efficiency and requiring a minimum of electrical power. Unlike with commercial speakers used by other manufacturers, the antenna does not collect dirt, such as leaves, and is cleaned easily. The structure consists of a coated and corrosion-resistant aluminum alloy for durability in all climates. The heavy top-structure reduces the noise made by impacting precipitation, so the sodar can be operated also during rainy periods.



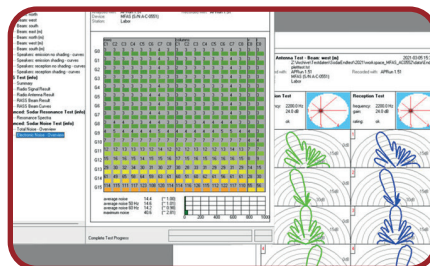
## True Vertical Beam

Fluctuations of the vertical wind are fundamentally related to turbulence and convection. The measurement of vertical wind variance is a key to quantify the strength of atmospheric turbulence, often expressed in terms of the kinetic energy dissipation rate. In order to measure the vertical wind variance with a wind profiler, it is essential to use an antenna with true (and not calculated) vertical pointing direction. Unlike most reflector antennas, the phased-array antennas of the FAS Series Sodar Wind Profilers provide true vertical beams and allow the exact quantification of atmospheric turbulence.



## Simultaneous Multi-Frequency and Multi-Beam Operation

The FAS Series Sodar Wind Profilers can emit and receive up to ten different frequencies in up to nine different directions and with simultaneous emission and reception. By making use of this ability, the signal-to-noise ratio is drastically improved, increasing the measurement range and reducing required averaging times. Consistency checks between frequencies and directions and an imposed additional frequency jitter eliminate spurious outliers. All frequencies and phases are generated digitally with constant time-lag instead of constant phase-lag relation. This creates accurate emission angles and eliminates the need for temperature recordings to correctly derive wind velocities from the Doppler shifts.



## Completely Automated Self-Test

The FAS Series Sodars are the only acoustic wind profilers on the market which can run a fully automated self-test including the phases and amplitudes of each individual acoustic element. This is possible because the acoustic transducers of all elements can be controlled individually. In this way, the software can even determine the exact emission angles of the nine beams. Other functional stages and environmental conditions are tested as well, so the self-test can fully assess the operability of the installation. Self-tests can be run on simple key-stroke or automatically in selected intervals with internal storage of the generated self-test reports.



# OPTIONS

## Antenna Heating

The Antenna Heating prevents ice and moisture buildup to maintain clear signal transmission and ensure reliable antenna performance in cold conditions. The heating is started once temperature

drops below approx. +10°C. The heating is stopped once temperature gets higher than approx. +20°C. The antenna heating only works with the Power Supply for Antenna Heating, available for SFAS, MFAS and XFAS.

# ACCESSORIES

## RASS Extension RAE2

The Scintec RAE2 RASS Extension upgrades any Sodar model (SFAS, MFAS or XFAS) to allow precise measurements of temperature profiles in the atmospheric boundary layer.

## windRASS Extension

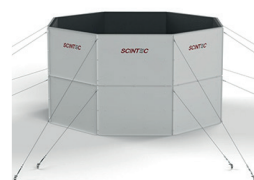
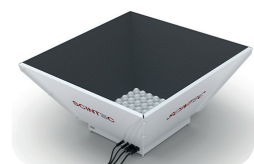
The Scintec windRASS Extension upgrades the Sodar models SFAS or MFAS to work in radio-acoustic mode for precise measurements of both wind and temperature.

## Acoustic Enclosure - Small

The small acoustic enclosure is directly mounted at the top of SFAS or MFAS antennas. It consists of four panels that are equipped with sound absorption lining.

## Acoustic Enclosure - Large

The large acoustic enclosure is placed on the ground surrounding SFAS, MFAS or XFAS antennas. It consists of eight panels (SFAS) or sixteen panels (MFAS/XFAS) that are



## Support Stand with Electronic Compartment and Acoustic Enclosure

This accessory consists of a support stand for SFAS, MFAS or XFAS antennas with an electronic compartment and an acoustic enclosure on the



top, which is equipped with sound absorption linings. The Support Stand is recommended for permanent installations.

## AC Power Supply

This unit is for operation of a FAS Series sodar system with AC power.

## Power Supply for Antenna Heating

This unit is for operation of SFAS, MFAS or XFAS Antenna Heating with AC power.

## Isolating DC Power Adapter Type L, 9-36 VDC

This power adapter allows for DC operation of SFAS or MFAS.

## DC Power Cable Antenna Heating, 24 VDC

This power cable allows for DC operation of SFAS Antenna Heating and MFAS Antenna Heating.

## RS485 Converter Set

This set of RS485 Converters allows extending the length of the data cable between an SFAS, MFAS or XFAS system and the user PC.

## RS485 Cable, 100-500 m

This extension cable (100-500 m) can be used in conjunction with the RS485 Converter Set.

equipped with sound absorption lining.



## BASIC SPECIFICATIONS

Description	SFAS	MFAS	XFAS	Remarks
Number of antenna elements	64	64	52	piezo-electric
Electric (acoustic) output power	20 W (5 W)	50 W (7.5 W)	500 W (30 W)	maximum, selectable
Frequency range	2525 to 4850 Hz	1650 to 2750 Hz	825 to 1375 Hz	auto-configuration or user-defined
Multi-frequency	sequential and polyphonic			auto-configuration or user-defined
Multi-beam operation	up to 9 beams in two configurations			auto-configuration or user-defined
Beam angles	0°, ±8°, ±13° or 0°, ±19°, ±24°	0°, ±9°, ±16° or 0°, ±22°, ±29°	0°, ±9°, ±16° or 0°, ±22°, ±29°	selectable
Number of range gates	100	100	256	maximum setting
Vertical resolution	5 m	10 m	20 m	finest setting
Minimum height	10 m	20 m	40 m	depending on settings, environment and atmosphere XFAS: limited to height of boundary layer
Maximum height	500 m	1000 m	> 2000 m	depending on settings, environment and atmosphere XFAS: limited to height of boundary layer
Averaging time	1 to 60 min	1 to 60 min	1 to 180 min	user-defined
Accuracy of horizontal wind speed	0.1 to 0.3 m/s			depending on mode, average over varying conditions
Accuracy of vertical wind speed	0.025 to 0.1 m/s			depending on mode, average over varying conditions
Accuracy of wind direction	< 1.5°			at wind speeds > 2 m/s
Measurement range of horizontal wind speed	0 to 50 m/s			nominal
Measurement range of vertical wind speed	-10 to 10 m/s			nominal
Operating conditions	temperature: -35°C to +55°C (-30°F to +130°F); relative humidity: 0% to 100%			
Power requirement DC operation	12 or 24 VDC, 20 to 40 W	12 or 24 VDC, 20 to 50 W	18 VDC, 75 to 300 W	average, depending on settings
Power requirement AC line operation	100 to 240 VAC, 35 to 70 W	100 to 240 VAC, 45 to 90 W	85 to 264 VAC, 200 to 500 W	SFAS and MFAS: average, depending on settings. XFAS: 1500 W peak
Size	44 x 42 x 16 cm	74 x 72 x 20 cm	145 x 145 x 33 cm	acoustic antenna without enclosure
Weight	11.5 kg	32 kg	144 kg	acoustic antenna without enclosure

# SOFTWARE SPECIFICATIONS

Description	Remarks
Operating system compatibility	Windows 11, Windows 10, Windows Server 2025, Windows Server 2022, Windows Server 2019
System monitoring	remotely monitor the system status in an automatic way via the SNMP interface. Notification about system status can also be sent to user via SMS
Control and configuration	graphical user interface with auto-configuration functionality, no manual editing of configuration files required
Real-time display	wind barb and vector plots, profile plots, time vs. height color plots, wind roses, raw spectra plots and tabular outputs
Displays offline	same as displays in real-time
Real-time data export	network output via FTP, TCP, UDP, or shared folder
Reprocessing of data	reprocess of time series, spectra, moments or main data, fully configurable through graphical user interface
Echo detection	automatic fixed echo detection and correction
Quality control	thorough data confidence and data quality checks
Remote control capability	measurement control and change of configuration via LAN, Radio or GSM Modem
Hardware self-test	extensive self-test capability, which runs in a fully automatic way

## Data output includes (but is not limited to):

- Wind speed and direction
- Temperature (with RASS Extension)
- Standard deviations of wind components
- Turbulence intensity for wind energy applications
- Wind shear for airport applications
- Standard deviation of wind directions (sigma phi, sigma theta) and stability class for air quality applications
- Structure parameter of temperature  $C_T^2$  for wave propagation studies
- Turbulent kinetic energy
- Eddy dissipation rate
- Mixing height estimation
- Data quality (signal-to-noise ratio)
- Data confidence (consensus level)
- Various graphical representations (wind barbs, wind vectors, wind roses, probability distributions, etc.)
- Frequency distribution of wind speeds for power-curve calculations

Installations worldwide



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