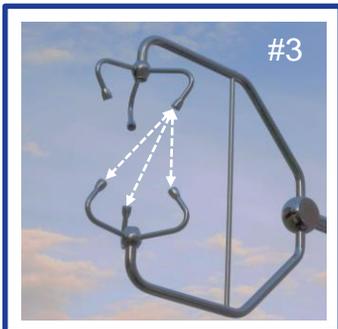
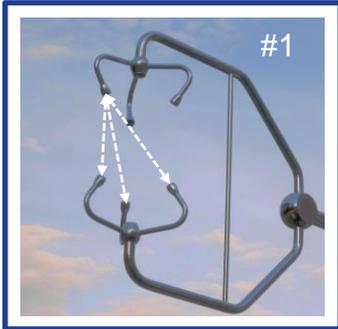


# Ultrasonic Wind Sensor

## uSonic-3 Class A *MP*



- New approach in 3D wind and turbulence sensing
- Unique “**Multi-Path**” measuring technique
- 3 x 3D sonic arrays in one sensor head
- 3 x 3 = 9 Radial wind components
- 3 x Directly sensed vertical wind component
- 3 x 3 Acoustic temperatures
- Minimum flow distortion by optimized design of sensor head and sonic transducers
- Online control and dynamic adjustment of signal gain
- Efficient sensor head heating (option)
- Embedded 2-axis inclination sensor (option)
- Internal mass storage on SD card (option)
- Convenient communication and data output by RS422 and Ethernet ports
- Remote control of system performance
- Ideal instrument for scientific applications and eddy covariance sites

# Ultrasonic Wind Sensor uSonic-3 Class A **MP**

## Typical instrumental applications

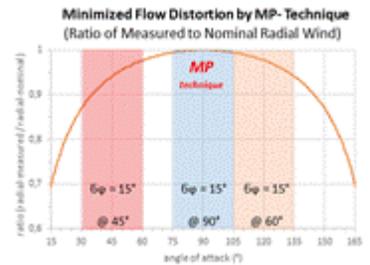
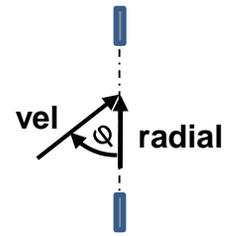
- Determination of eddy covariance fluxes
- Studies in atmospheric turbulence
- Air quality studies
- Sites with low turbulence (e.g. arctic/antarctic areas)
- Remote research stations
- Boom instrumentation on masts

The ultrasonic anemometer **uSonic-3 Class A MP** represents an innovative step forward to highest performance in atmospheric turbulence sounding. Based on the well proven METEK ultrasonic sensor family uSonic-3 the design of the sensor head enables the user to perform three independent measurements of the air flow quasi-simultaneously by arranging one sonic transmitter to three opposite sonic receivers. This provides redundancy in horizontal wind components measurements and allows a selection of the most advantageously positioned transmitter-receiver couples. Furthermore, three directly measured vertical wind components are available.

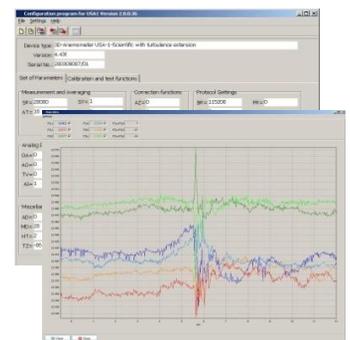
An embedded 2-axis inclination sensor (option) provides tilt angles of the sensor head thus allowing remote control of correct instrumental set-up.

A connection cable (6 m max.) connects the sensor head to the sensor electronics.

The sensor outputs 9 radial components, 9 temperature measures and 3 Cartesian wind components (x, y, z) as raw data or as averaged data with adjustable averaging intervals.



## Graphic User Interface



## Separate Electronics for Easy Installation



Ambient conditions	- 40 ... + 60 °C, 5 ... 100 % rH
Average time / number	1 ... 3600 s / 1 ... 65365 samples
Sampling rate	max. 30 Hz (→ max. 3 x 30 = 90 Hz conventional sampling)
Measuring ranges	max. 40 m/s, - 40 ... + 60 °C
Accuracy wind component	Acceptance angles ± 170 °
- max. dev.	± 1 % @ 5 m/s, 0 ° ... 10 ° of horizontal
- rms	± 2 % @ 5 m/s, 10 ° ... 20 ° of horizontal
- resolution	0.5 % @ 5 m/s, 0 ° ... 10 ° of horizontal
	1 % @ 5 m/s, 10 ° ... 20 ° of horizontal
	0.006 m/s (vertical), 0.01 (horizontal)
Accuracy wind direction	Acceptance angles ± 170 °
- max. dev.	± 1 ° @ 5 m/s, 0 ° ... 20 ° of horizontal
- rms	0.5 ° @ 5 m/s, 0 ° ... 20 ° of horizontal
Accuracy temperature	
- resolution	0.01 K
Output data set	9 radial components ( incl. 3 x vertical), 9 temperatures x, y, z, T, vel, dir
Output protocols	standard, checksum, NMEA
Synchronisation	1 x digital in, 1 x digital out
Turbulence module (upgrade option)	online calculation of means, variances, covariances, heat flux, momentum flux, Monin-Obukhov length, etc.
Internal memory (upgrade option)	SD card
Power supply	10 ... 36 VDC / 2.5 W (without options)
Sensor head heating (option)	10 ... 24 VDC / max. 100 W
Communication	RS422, RS485 (300 ... 115200), Ethernet, all ASCII
Analog output (upgrade option)	4 x 12 bit, 0 ... 10 VDC or 0/4 ... 20 mA (max. load 250 Ω), adjustable ranges (x, y, z, T)
Analog input (upgrade option)	6 x analogue 16 bit, 2 x TTL counter, 2 x PT100
Measuring paths	6 x 53.2 ° / 90 °, L = 160 / 140 mm
Inclinometer (option)	2 axis, resolution 0.1 °, response time 0.5 Hz

METEK GmbH, Fritz-Strassmann-Str. 4, 25337 Elmshorn, Germany

Phone: +49 4121 43590, Fax: +49 4121 4359 20

E-mail: info@metek.de, Internet: http://www.metek.de