

# Lidar Wind Profiler

## Wind Ranger 100/200



- Affordable, compact, eye-safe cw wind lidar
- Innovative frequency modulation of laser signal
- Wind profiling within up to 20 range gates
- Measuring range 7 ... 100 m / 200 m
- Built-in quality control
- Automatic system monitoring
- Easy and fast transportation and installation
- Easy to operate by web-interface for control and real time visualization
- Typical applications include wind farm planning, urban climatology, marine platform instrumentation, etc.
- Set-up at sites when wind masts cannot be mounted



# Lidar Wind Profiler **Wind Ranger 100/200**

Laser wavelength	1545 nm, laser class 1M (eye-safe)
Range of measuring heights	Wind Ranger 100: 7 ... 100 m Wind Ranger 200: 7 ... 200 m
Max. number of measuring heights	20, consecutively measured (typically 4 ... 8 used)
Height resolution (height dependent)	Wind Ranger 100: 0.16 m at 10 m, 16 m at 100 m Wind Ranger 200: 0.08 m at 10 m, 8 m at 100 m
Range of wind speed	0 ... 60 m/s
Range of wind direction	0 ... 360 °
Range of std. dev. of vertical wind	0.02 ... 3 m/s
Accuracy of wind speed*	0.2 m/s or 2 % at wind speeds > 10 m/s
Accuracy of wind direction*	3 ° at wind speeds > 5 m/s
Accuracy of std. dev. of vertical wind*	0.1 m/s or 5 %
Dwell time per measuring height	0.5 s or 1 s (one complete VAD scan)
Averaging time wind profiles	adjustable, typically 1 .. 30 minutes
Data output and control	Ethernet, Web GUI
Built-in memory	32 GB
Position	GPS
Options	Recording of 2-axis inclination sensor
Ambient conditions (standard)	- 30°C ...+ 45 °C, 5 ... 100 %
Power consumption lidar	24 VDC, 60 W lidar / extra 140 W temperature control
Weight	approx. 50 kg
Enclosure dimensions (H x W x D)	620 mm x 530 mm x 340 mm
(incl. 4 height adjustable supports)	(840 mm x 540 mm x 580 mm)

\* Observed uncertainty in measurements depends on parameter settings (averaging time, number of measuring heights, etc.) and atmospheric conditions (aerosol distribution, visibility, turbulence). Accuracies are given for 10 minutes averages, 8 measuring ranges, 1 rev./s , moderate turbulence.

The Metek Wind Ranger is a CW lidar with an innovative frequency modulation which derives 3D wind vectors from continuous VAD scans for a narrow 10° tilt angle at rotational speeds up to 2 rps. The frequency modulation overcomes major limitations of conventional CW lidars:

- No need for external wind direction sensor as sign of radial wind is derived
- No lower threshold of wind speed.
- No bias of height allocation in case of low-level clouds.
- Online calculation of the range of the effective measuring volume for each selected range.

This concept allows operation within forest clearings, street canyons, etc. and other sites with strong vertical wind shear. Stand-alone operation with solar power is feasible thanks to moderate power consumption. Ethernet allows local or worldwide access and data distribution.

Typical applications of the Wind Ranger 100/200 include:

- Meteorological systems & networks
- Pollution dispersion parameters
- Air quality studies
- Wake vortex monitoring
- Wind energy
- Climatology at remote sites
- Research stations
- Urban & Industrial Sites
- Marine and offshore platforms
- Airports
- Sport events

