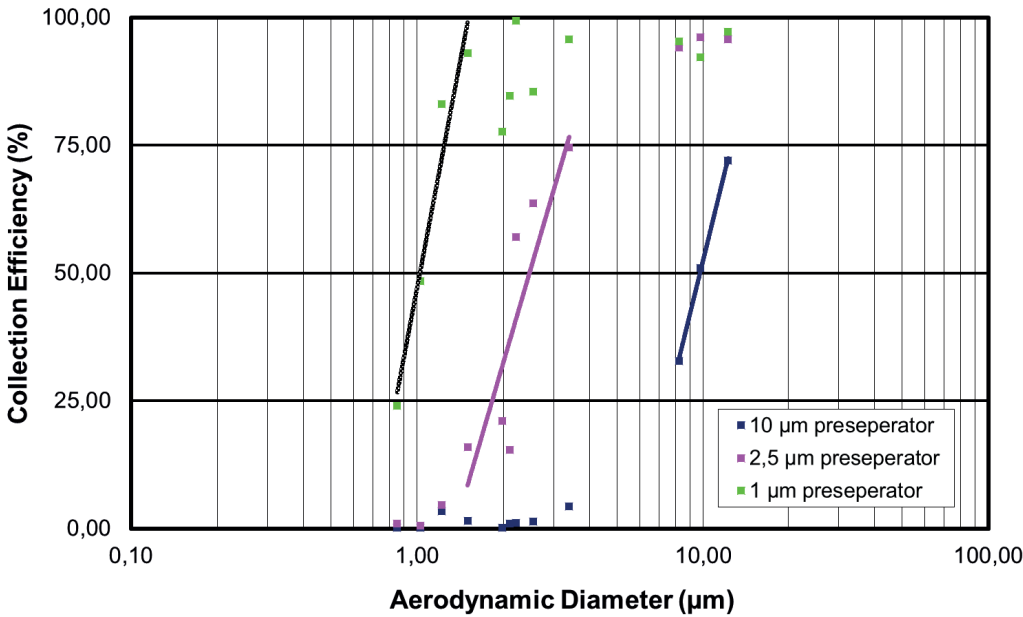


Technical data

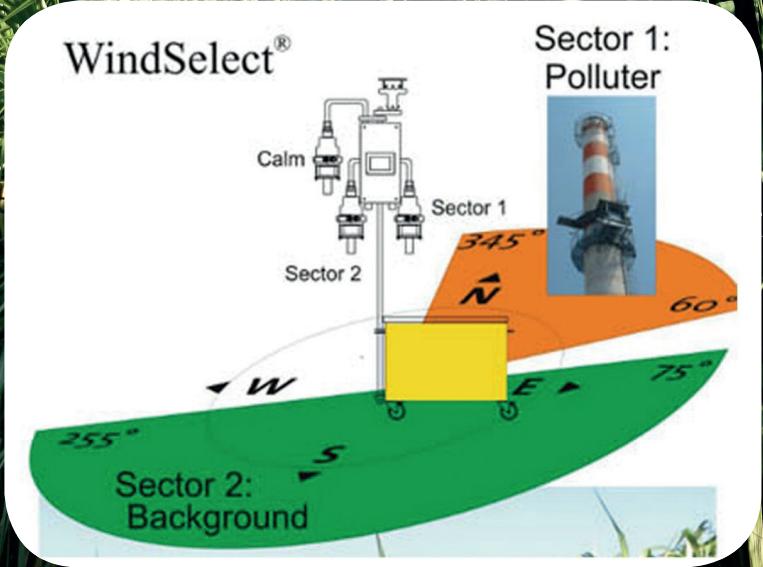
Evaluation Parameter	<ul style="list-style-type: none">• Total dust• Dust > 10 µm (50% cut point)• PM₁₀• PM_{2,5}• PM₁• POP's• PCDD/F• Metals• Mercury
Range of application	
Sampling volume	• 200 - 1.000.000 liters per sector
Ambient temperature	• 0 – 40°C
	• -20°C -40°C with heater
Humidity	• 0 – 90% rH
Ambient humidity	Up to 100% rH with heater
Sampling mode	<ul style="list-style-type: none">• Wind direction dependent switching using up to 3 cartridges• Wind speed dependent switching by setting calm limit, using 3rd cartridge
Heater optional	<ul style="list-style-type: none">• 230 VAC heater• 1,6 A with external heater, controlled by filter T set point
Cooling optional	<ul style="list-style-type: none">• 230 V AC pump – 100% time• 24V DC fan or pump – 100% time• 24V DC Peltier cooler, max 3,7 A
Gas meter	<ul style="list-style-type: none">• 0.025 to 4 m3/h• Accuracy: better than 2%
Pressure sensor	• Accuracy + 10 mbar
Pump capacity	• 5,0 m3/h (1013,25 mbar, 0°C)
Power supply	• 230 V AC
Typical power consumption	650 VA incl. <ul style="list-style-type: none">• External 350 W heater• 3,7A Peltier (90W cooling)

Impactor Cutpoints:



Contact:  CREATIVE APPROACHES

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Windselect System

Evaluate the potential
of PM₁₀ reduction

www.genius5-instruments.com

Low windspeed correlate with higher PM10

Atmospheric dispersion of pollutants is dependent on windspeed and winddirection. Horizontal winds are important for dispersion and transport of pollutants, therefore the evaluation of the PM10 and PM2,5 values shall include a correlation to the local windspeed data.

Highest PM10 levels are observed at wind speed below 3 m/s. Lower wind speed is correlated with higher PM10 values. Genius5 Windselect® measures windspeed and counts the seconds in 6 windspeed classes.

	Sampling volumes of the 3 cartridges									
Sampling data	source	background	calm	< 2 m/s	2-5 m/s	5-10 m/s	10-15 m/s	15-20 m/s	> 20 m/s	
07.11.2015 14:00	115.4	49.1	110.6	289	77	90	56	0	0	
07.11.2015 14:10	115.4	50.1	410.1	766	109	167	70	0	0	
07.11.2015 14:20	115.4	50.1	711.6	1169	267	204	72	0	0	
07.11.2015 14:30	115.4	50.1	1016.1	1682	350	208	72	0	0	
07.11.2015 14:40	115.4	50.1	1320.4	2113	358	369	72	0	0	
07.11.2015 14:50	170.9	78.3	1428.2	2434	366	589	123	0	0	
	Sampling volumes in liters			Windspeed es in seconds						

Shifting wind directions reduce PM10 levels

Pollutant dispersion is also dependent by the variability of the wind direction. If the wind direction is constantly shifting, pollutants are dispersed over a larger area, local PM10 concentra-

tions are lower. Genius5 Windselect® measures the wind direction and counts the seconds in 16 winddirection classes (N, NNE, ...) with 10 min resolution.

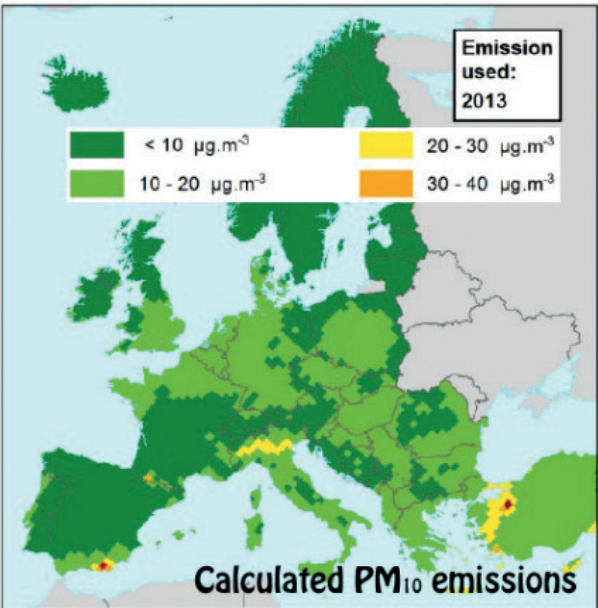
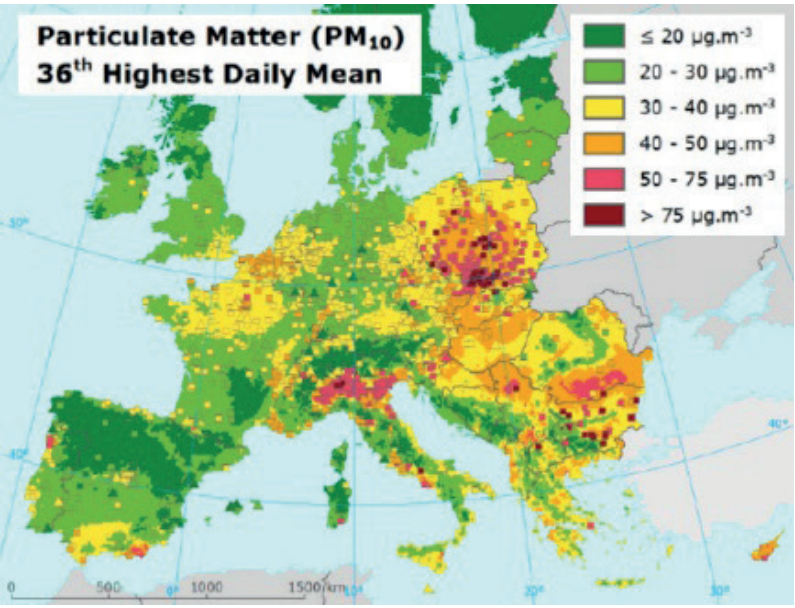
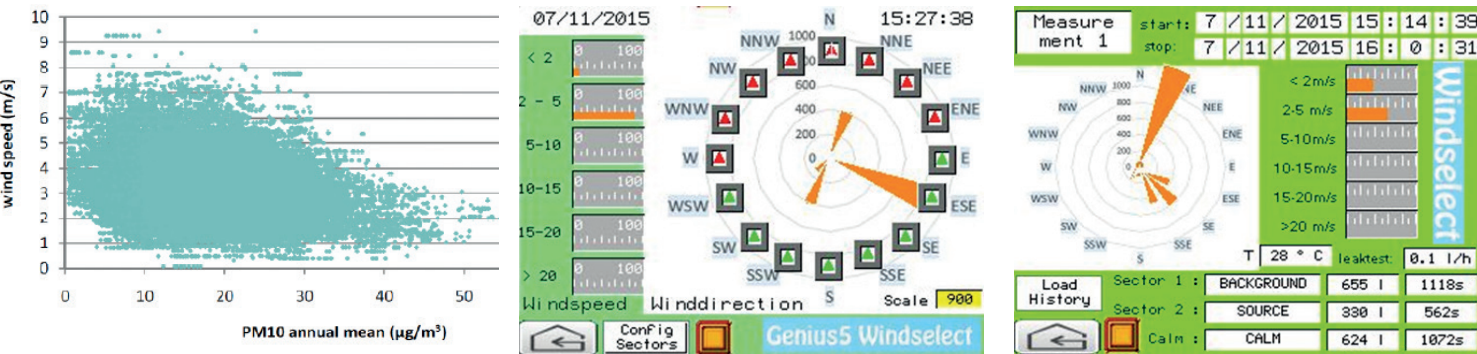
Windsector	N	NNE	NEE	ENE	E	ESE	Se	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
07.11.2015 14:00	117	34	14	27	12	17	20	28	46	3	5	14	12	11	13	14
07.11.2015 14:10	177	51	22	35	18	27	32	73	148	42	29	42	30	20	21	27
07.11.2015 14:20	200	234	97	52	25	47	33	79	168	130	33	63	67	20	24	29
07.11.2015 14:30	214	243	254	52	25	47	33	79	193	382	66	79	87	40	34	45
07.11.2015 14:40	376	245	256	61	27	49	34	102	384	544	77	80	88	40	34	46
07.11.2015 14:50	661	286	278	78	47	72	39	105	446	550	82	83	94	44	42	56
07.11.2015 15:00	661	298	297	81	54	79	39	105	446	550	82	83	94	44	42	56

Potential for fine dust (PM10,2,5) reduction

“Hot spot sites” (near a street or a point source) and “Back ground sites” show different concentrations of PM10. Regular 24 hour measurements don’t provide informations of local traffic impact or point source impact to the result.

a Point source/traffic. During calm condition, the Genius5 samples to a 3rd cartridge, while wind speed is below the set calm limit.

The Windselect® data give valueable information, about adverse dispersion effects or low level point souces and the potential for PM10 reduction in µg/m3, if the emissions of the point source/ street are reduced.



Measurement in the Windselect® mode

The Genius5® Windselect® includes an interface, where a Gill windsensor is connected. The ultrasonic sensor measures Windspeed and Winddirection and transfers the results to the Genius5® controller every second. Based on the data the controller samples to different cartridges dependent on wind speed and wind direction.

Additional parameters may be used to calculate the impact of many different sources to PM10 and PM2,5 concentrations like a “finger print”.

Surveilling mercury levels a new topic

Methylmercury is a big danger for humans and environment, because it is enriched in the food chain. In embryos it is enriched in the brain and bone marrow, causing lower Intelligence quotient (IQ).

After the selected measurement periode, the cartridges are sent to the laboratory together with the USB memorystick, where the cartridges and the data are evaluated.

More information with different cartridges

Besides the PM10 levels, other parameters provide additional informations, to separate the influence of several point sources:

- 1. All cartridges sample the fraction greater than 10 µm with a 50% cutpoint, providing information about pollutant deposition
- 2. Cartridge FU_10 is designed to sample PM10 in combination with POP’s (persistant organic pollutants) and PAH’s
- 3. Cartridge FU_20 is designed to sample PM10 in combination with metals, gaseous mercury is absorbed on activated carbon
- 4. Cartridge FU_30 samples PM10, PM2,5 as well as POP’s

Note:
PM10 as defined by European legislation, is a 24 hours mean value. The obtained data from Windselect® are related to the total sampling period, splitted to 3 cartridges in correlation with local wind data, to calculate the potential of fine dust reduction.

