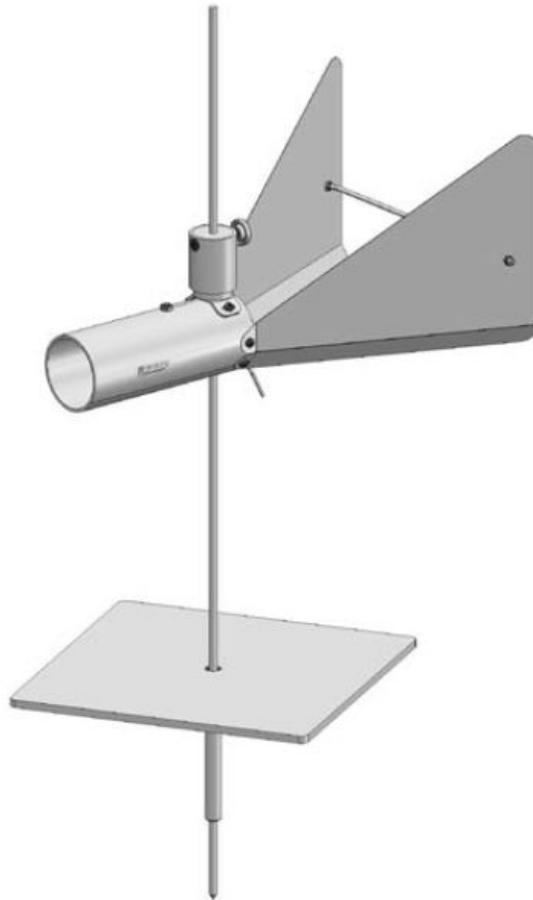


Saltiphone



Introduction

The saltiphone is a sensor for measuring wind erosion. It consists of a microphone, installed in a stainless steel housing, which is mounted on a ball bearing. Two vanes at the back of the tube ensure a proper positioning of the microphone in the wind. The sensor is adjustable in height (0-50 cm) and is supplied with mounting base. The sensor is connected with a thin cable to the electronics build in a waterproof aluminium housing. Each sensor is individually calibrated.

For the use of the saltiphone a continuous power supply is needed. For the use in combination with the meteostation 16.98 and/or 16.99 we supply a mains power supply or a solar energy system.

Particles larger than 50 microns blown by the wind above a threshold will hit the microphone. Sand particles hitting the microphone produce high frequency noise, which can be distinguished from other noises caused by wind and rain. Frequencies of about 8 KHz are amplified and used to determine saltation whereas other frequencies are reduced using a narrow band filter. Each particle impact produces a pulse which is cut off after one milli second. Pulses can be counted and stored with 16.98 or 16.99 meteostations.

Saltiphone

Electrical characteristics

Supply voltage :	4.8 - 35 Vdc		
Supply current :	15 mA typical		
Output signals :	digital	proportional with the number of particles	
	jumper selectable:	-counts	
		-counts divided by factor 10	
	signal level:	low level	< 0.4 Volt
		high level	> 4.6 Volt
		t high	0.8 msec typ.
		t low	0.2 msec min.
		count-rate max.	1000 per second
	analogue	(0-1 V output valid 2 seconds after power-up)	
	jumper selectable:	-analogue proportional with the number of particles	
		-analogue proportional to the energy of particles (number, mass and speed)	
	signal level:	0 - 1 Volt	

Dimensions sensor

Length :	300 mm
Width :	190 mm
Height :	140 mm
Cable length :	data cable standard 7.5 m

Weight

Total weight :	2300 g
Base plate :	1700 g
Mounting rod :	100 g
Sensor :	500 g

Output signals

The saltiphone provides 2 output signals at the same time. The first signal is a digital pulse, the second an analogue voltage.

Digital pulse

Every particle impact produces a pulse which is cut off after one milli second. This signal is available at the digital output-pin. To allow loggers with limited count-speed to be used, the digital pulsetrain can be divided by 10. To make this selection, change jumper setting on the printed circuit board.

Analogue voltage

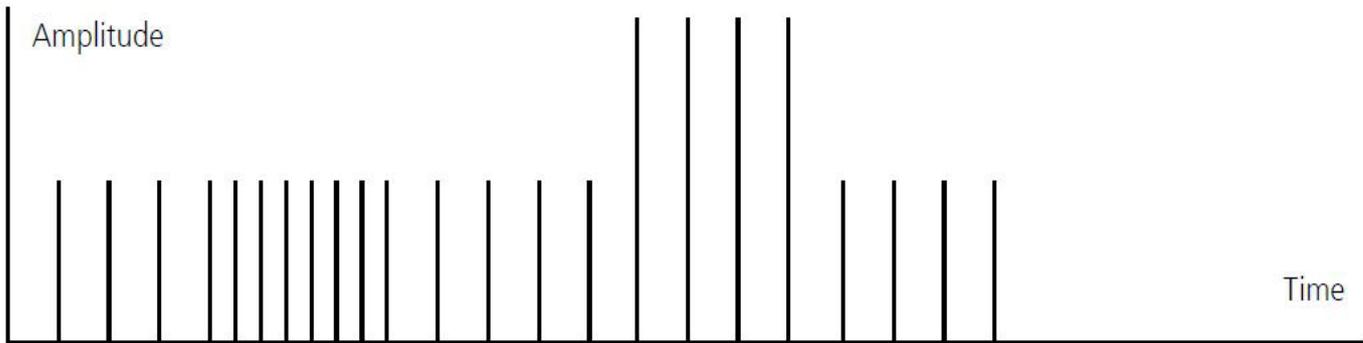
In many cases it is less troublesome to log analogue signals rather than digital. Therefore an analogue representation of the digital pulses is provided. By changing the jumper setting on the printed circuit board, it is also possible to measure particle impacts directly. In this mode the saltiphone becomes also sensitive for particle-size and speed.

Saltiphone

Waveforms

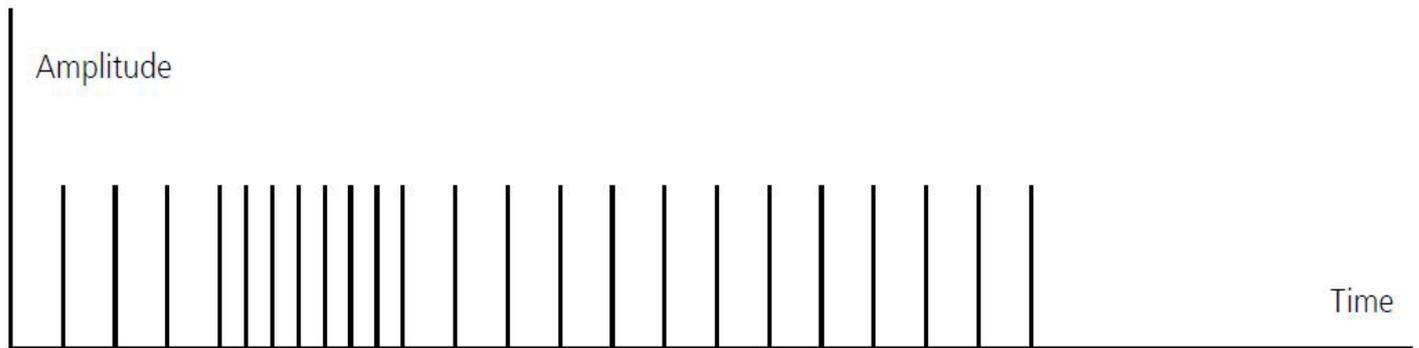
Microphone signal

On the vertical axis the amplitude of the microphone membrane is drawn. The horizontal axis represents time.



Digital output

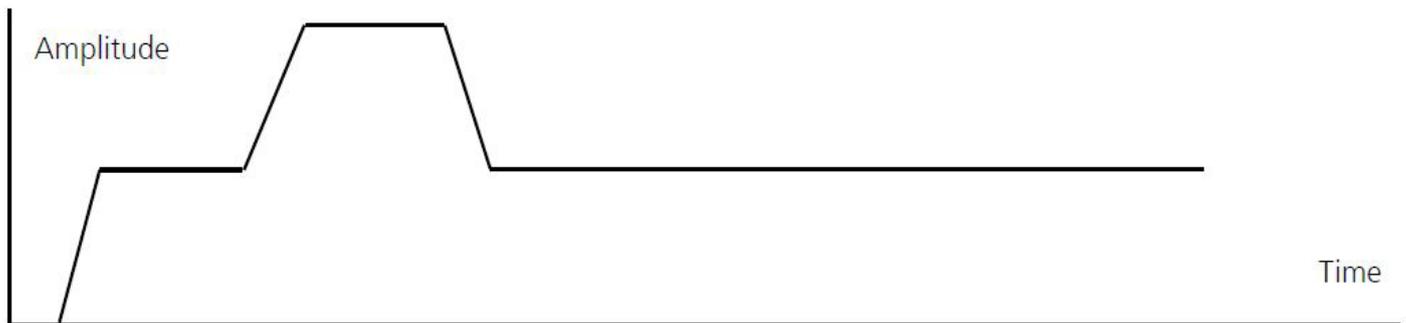
On the vertical axis the amplitude of the digital output is drawn. The horizontal axis represents time.



Saltiphone

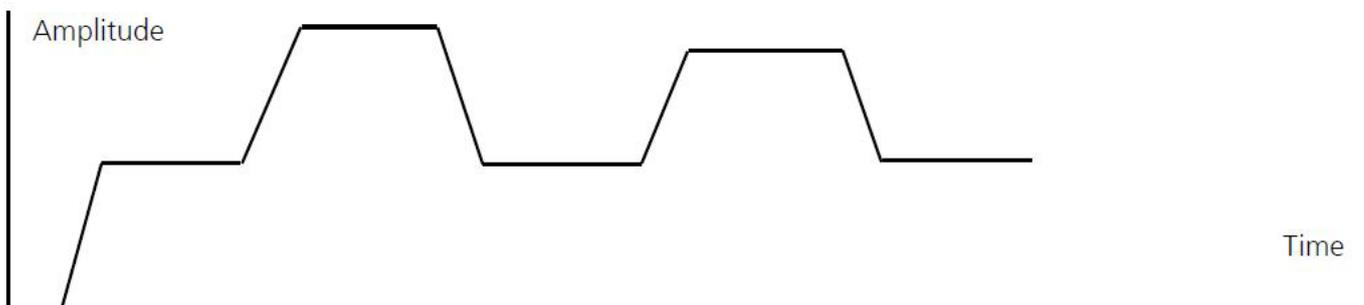
Analogue output (counts)

On the vertical axis the amplitude of the analogue output is drawn. The horizontal axis represents time.



Analogue output (energy)

On the vertical axis the amplitude of the analogue output is drawn. The horizontal axis represents time. Notice that output signal has become sensitive for input amplitude.



For the power supply of the saltiphone you can connect the saltiphone either to a battery or a solar panel. Connecting from JP3, pin 3 and 4

When connected to a datalogger, you use the power supply of the logger.

The saltiphone provides 2 output signals **at the same time**. The first signal is a digital pulse, the second is analogue voltage.

You can decide to connect the logger to the digital output pin and/or to the analogue pulses. (see JP3, pin 1 and 2)

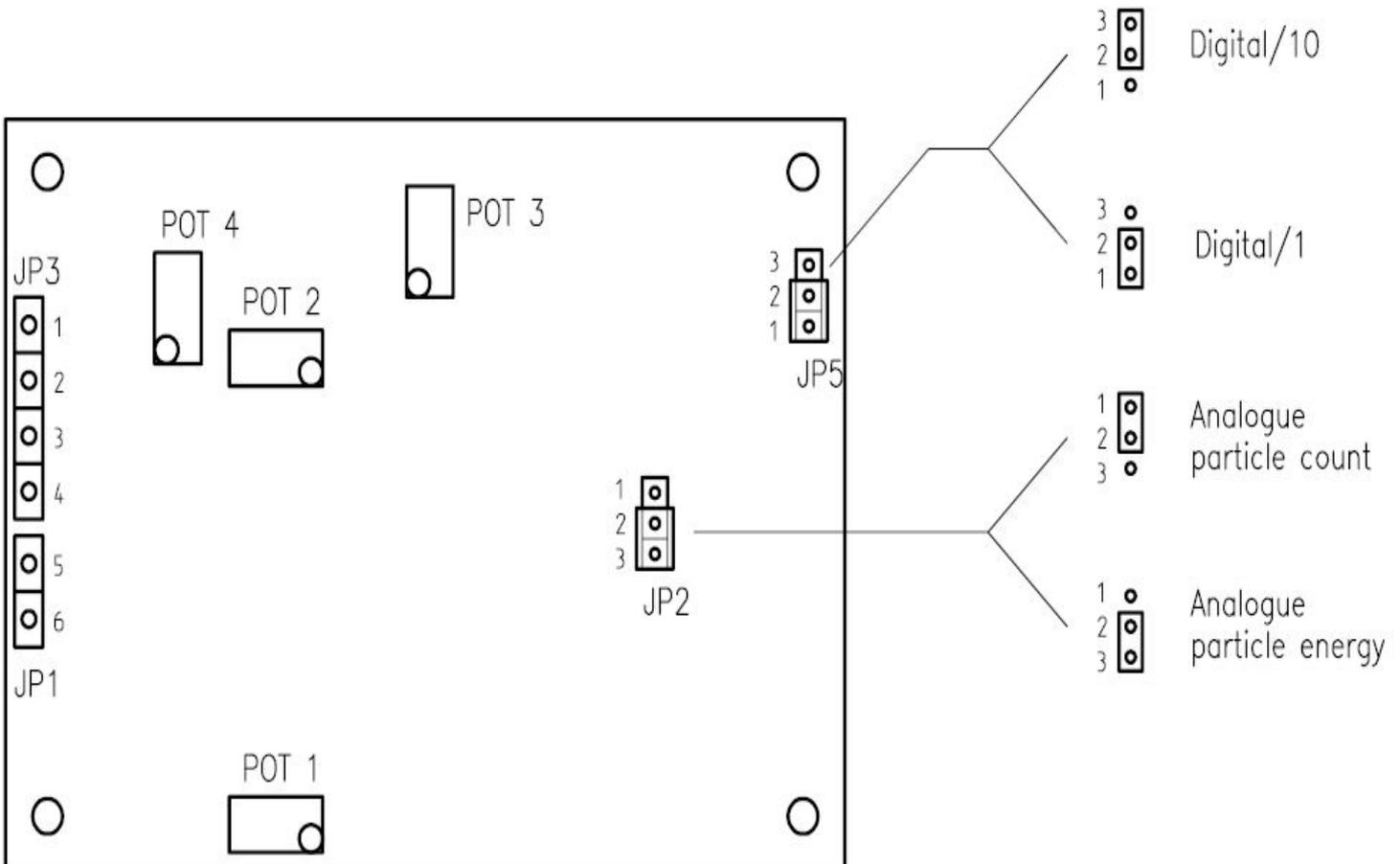
Digital voltage

To allow loggers with limited count-speed to be used, the digital pulse can be divided by 10. To make this selection, change jumper setting on the printed circuit board. (see JP5)

Saltiphone

Analogue voltage

By changing the jumper setting on the printed circuit board, it is also possible to measure particle impacts directly. In this mode the saltiphone becomes also sensitive for particle-size and speed.(see JP2)



JP3 Signal connection table

Pin	Color	Function
1	Green	Analogue output
2	Yellow	Digital output
3	Red	V + supply
4	Blue	Ground

JP1 MICROPHONE connection table

Pin	Color	Function
5	Screen	Microphone – signal
6	Red	Microphone + signal