

# TECHNICAL NOTE:

## Dust Sentry vs Dust Sentry Profiler

The Dust Sentry and Dust Sentry Profiler (Dust Profiler) both measure particulate concentrations using laser light scattering but the methodology and optics design are different. This technical note gives a direct comparison of the specifications as well as some guidance on the applications best suited to each.

The table below is a side by side comparison of the specifications of the two products to help you make the correct choice for your application.

	Dust Sentry	Dust Profiler
<b>Measurement technology</b>	Near forward angle laser scattering nephelometer	Right angle laser scattering particle counter
<b>Particle Counts</b>		
<b>Range</b>	N/A	0-1,000,000 particles/L
<b>Size channels</b>		0.3, 0.5, 0.7, 1.0, 2.0, 3.0, 5.0, 10.0 µm
<b>Particle Mass Measurement</b>	<b>Range / ug/m<sup>3</sup></b>	<b>Range / ug/m<sup>3</sup></b>
<b>PM1</b>	0 - 2000	0 - 200
<b>PM2.5</b>	0 - 2000	0 - 2000
<b>PM10</b>	0 - 2000	0 - 5000
<b>TSP</b>	0 - 2000	0 - 5000
<b>Simultaneous?</b>	No – requires cyclone	Yes
<b>Accuracy</b>	<±(2 µg/m <sup>3</sup> + 5% of reading)	<±(5 µg/m <sup>3</sup> + 15% of reading)
<b>Resolution</b>	0.1 µg/m <sup>3</sup>	0.1 µg/m <sup>3</sup>
<b>MCERTS certified</b>	Yes	No
<b>Auto zero check</b>	Yes	No
<b>Optical span check</b>	Yes	No
<b>Sample flow</b>	2 LPM	1 LPM
<b>Factory calibration interval</b>	24 months	12 months
<b>Operating temperature</b>	-10°C to +50°C	-10°C to +50°C*
<b>Heated inlet</b>	Yes	Yes
<b>Power consumption</b>	15 W	15W

\*Above 40 °C the laser may require more frequent servicing

Key points:

- The Dust Sentry is MCERTS certified and has greater accuracy than the Dust Profiler.
- The Dust Profiler can measure 4 mass fractions simultaneously
- The Dust Sentry is more durable when operating in high temperatures
- The Factory Calibration interval of the Dust Profiler is shorter than the Dust Sentry

## Application

The Dust Sentry is well suited for compliance monitoring where a single parameter is measured and reported against. In these cases a certified and robust monitoring solution with highest accuracy is likely to be most appropriate. By interchanging sharp cut cyclones the Dust Sentry can give readings for TSP, PM10 and PM2.5 – although not simultaneously. Occasionally a regulatory body may require compliance against more than one parameter at the same site in which case multiple Dust Sentry instruments can be deployed or the Dust Profiler can be considered.

The Dust Profiler is well suited to air quality studies and research where maximising the number of parameters and available data is of interest. It is also useful when power consumption is a consideration (such as solar applications) for measuring multiple PM parameters and where operating more than one instrument is not possible. However studies where fewer parameters are needed and/or greater accuracy is required, are likely to favour the Dust Sentry.

Robustness and servicing is an important consideration especially in remote or particularly harsh environments. Locations with very high dust loading such as construction sites or in the desert can be tough on the optics used in the Dust Sentry and Dust Profiler. Consideration should be given to the frequency and therefore cost of calibration. This is even more important when the units are operating remotely and the distance to site imposes additional costs. The longer calibration interval of the Dust Sentry may favour its deployment over the Dust Profiler in harsh or remote environments.

Temperature is another factor that may influence the decision. High temperatures, regularly in excess of 40°C, can be challenging. The Dust Sentry and the Dust Profiler are equipped with solar shielding to reduce thermal load, which is a unique feature of these instruments. The Dust Sentry has been shown to perform well at the upper limits of the stated operating range. Above 40°C the laser in the Dust Profiler may require more frequent servicing than the standard interval.

	<b>Dust Sentry</b>	<b>Dust Profiler</b>
<b>Applications</b>	Urban Air Quality Fenceline Monitoring Construction Sites Mining/Quarries	Air Quality Research Short Term Surveys Source Apportionment Roadside Monitoring