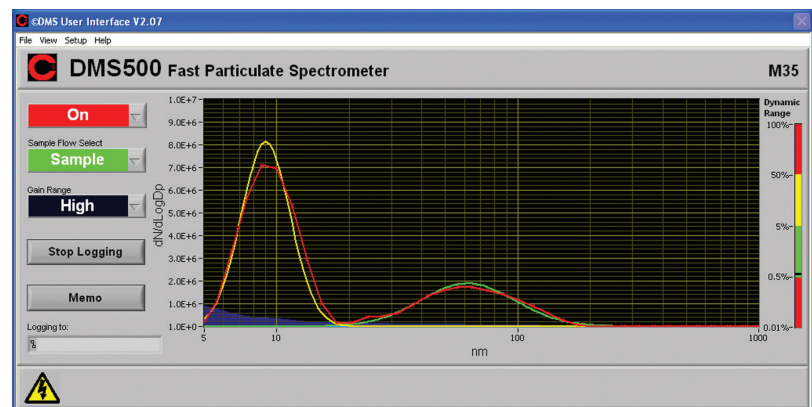


Advantages of the DMS500 *MkII* Fast Particle Mobility Size Spectrometer for Aerosol Science



DMS500 *MkII* Features

Electrical mobility spectral measurements

Measurement range 5 – 1,000 nm

(5 – 2,500 nm option)

DMS500 *MkII* Advantages

Fastest available $T_{10-90\%}$ time response

Calibration for different particle morphology

Traceable calibration

Highest sensitivity

No radioactive sources required

Low diffusion loss of small particles

Wide dynamic range (9 orders)

DMS500 *MkII* Inputs & Outputs

Real-time: particle mass
particle number
particle size spectra

Data recorded to PC at up to 10 Hz

Open text file format - easy to import

4 x 10 Hz analog inputs

4 x 10 Hz analog outputs

No file length limit

Multi log-normal parameterization of data

DMS500 Introduction

The DMS500 was launched in 2002 as the first of a new type of aerosol sizing instrument.

Classifying particles by electrical mobility and using sensitive electrometer detectors, the DMS500 has been widely adopted for ambient, workplace exposure, engineered nano-particles and other studies.

Fastest Time Response & Data Rate

With a $T_{10-90\%}$ response time of 200 ms and a data rate of 10 Hz, the Cambustion DMS500 is the fastest available instrument offering particle size/number spectra.

Traditional CPC based particle sizers operate on a scanning principle, requiring ~ 60 seconds for a full scan.

The DMS500 uses 22 parallel electrometer detectors, allowing continuous real-time measurement, with a data rate of 10 Hz.

The DMS500 provides all its outputs in real-time.

Low Diffusional Losses

Any instrument measuring below 100 nm must take steps to minimize small particle losses. The DMS500 uses a high sample flow (8 litres per minute) and *multiple* sheath flows inside the charger to significantly reduce losses of small particles.

Widest Available Size Range

The use of low pressure measurements (0.25 bara) allows extension of the measurement range. The standard DMS500 offers measurement from 5 – 1000 nm, while a switchable option offers the ability to select 5 nm – 2.5µm measurements.

Highest Sensitivity in Class

Aerosol instruments frequently involve a compromise between sensitivity and response time. The DMS500 offers both best sensitivity and time response available amongst fast electrical mobility sizers.

Constant Pressure

The classification section of the instrument is held at a constant 0.25 bara. This eliminates concerns about pressure correction algorithms, and also allows the instrument to sample from a wide range of low pressure environments without additional equipment.

Traceable Calibration

Each DMS500 is empirically calibrated with real aerosols, taking full account of particle losses, and even different particle morphologies.

Flexible Sample Handling System

The wide range of aerosol concentrations encountered in aerosol science means that some form of sample handling and dilution system may be required. The DMS500 may be purchased with fully integrated two stage diluter and heated sampling line, allowing raw sampling of high

concentration aerosols such as combustion sources. There is no need to separately add and meter makeup air.

The DMS500 and internal dilution system are calibrated as one for particle losses, ensuring the indicated concentrations accurately reflect the real world. The DMS500 automatically corrects the output for dilution if required.

Data Logging and File Format

The Cambustion DMS500 records data to the PC at between 10 Hz and 1/minute. The data file is in plain text, and can be viewed and presented in MS Excel (for which macros are provided) or in programs such as Matlab/Scilab.

The data file contains all spectral elements, together with the unique multi log-normal parameterisation.

There is no limit to file lengths, which is particularly relevant in ambient monitoring applications.

Data Presentation Tools

The DMS500 is supplied with a suite of freely distributable Excel macros. These assist the user in manipulating the data, automatically generating summary statistics, a variety of animations and contour plots.

Technical Support

Cambustion have been leaders in fast response instrumentation for over 20 years and have unrivalled expertise in the transient measurement of gases and aerosols. This allows us to provide outstanding support for a wide range of standard and special applications.

In Service Worldwide

The DMS500 has been adopted around the world for aerosol measurement in automotive, ambient, aerospace, biological and other applications since 2002.

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