Real time correlation filter for optical particle counter

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Abstract Particle signals are detected by two parallel measuring chains which consist of a detector and analog to digital converter. We have used OPT101 as photodiode and ADS7870 for A/D converter and the output signal from two parallel measuring chains is processed by on line correlation filter. This filter works as real time systems. A correlation algorithm has been applied for this work. The signal to noise ratio has been increased by applying correlation filter. The gain of the filter has been improved by introducing digital signal processing.

1 Introduction

Optical particle measuring instruments for the monitoring and analyses of aerosols are of fundamental importance in many ranges of the industrial technology. The optical particle counter is an instrument based on the principle of light scattering from particles. An important aspect of the optical particle counter is that it is a single particle counting instrument. That is a single particle is counted at a time. This is ensured by adjusting the flow rates. The rate at which particles enter the optical view volume and thus converting the particle counts to particle concentration. All particle counting systems have three parts:

- The sensor
- Counter
- Sampler

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