

**SEADM**

# Mobility Front End

Convert an existing mass spectrometer into an IMS-MS by adding a Differential Mobility Analyzer Front End



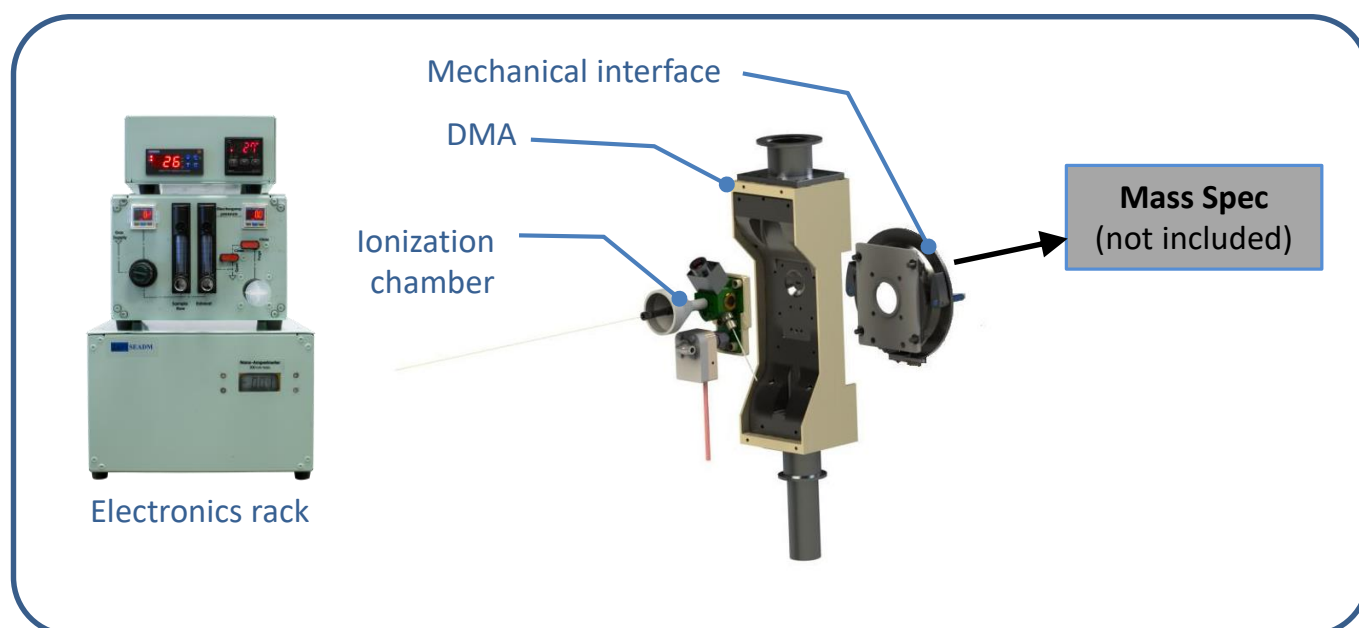
Superior Sensitivity and Selectivity for Real-Time Mass Spectrometry  
at Affordable Costs

# Mobility Front End

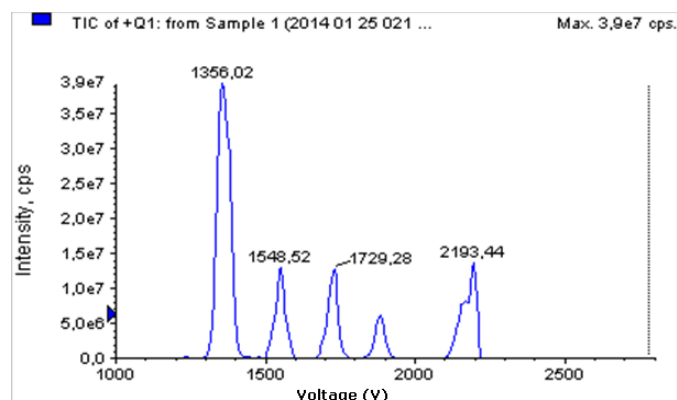
A mobility plug-in for mass spectrometers which enables a high speed, pre-filtration stage for liquid and gas samples.

The **Mobility Front End** has been designed for users of MS in the search of greatest levels of selectivity\*, or in applications where a quantitative measure of analyte cross section is needed.

The equipment is built from (i) an ionization chamber; (ii) SEADM's Differential Mobility Analyzer, DMA, which enables the separation of components in complex samples through electrical mobility; (iii) the DMA-MS interface, which enables Front-End mounting and dismounting without losing MS vacuum and (iv) an electronics rack devoted to voltage, temperature and flow control. The sole interfaces required are nitrogen and power supplies.



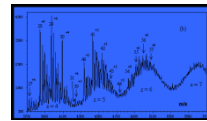
*Main elements of the Mobility Front End*



*Spectra of various tetra-alkyl-ammonium positive ions clearly separated by mobility.*

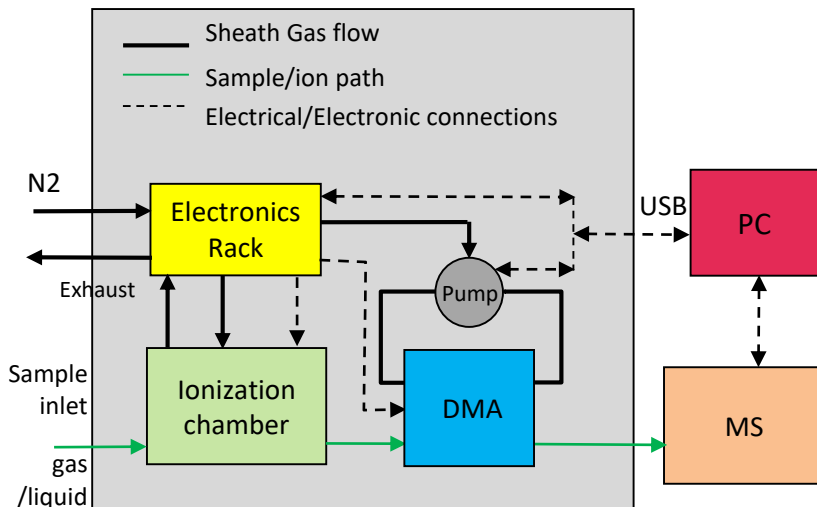
The **DMA Front End** is easy to operate. No specific chemical preparation of samples is required. Besides, the **Front End** can be easily assembled and disassembled (plug in/out) from your mass spectrometer in only 5 minutes (the MS can be reused at any time as a stand-alone device). Once plugged-in, it operates in a fully-integrated approach through easy-to-use software. (For ABSciex MS, operation will proceed through the software already built-in in your MS)

*\*Currently, interfaces –including hardware and software- are available for Bruker Impact HD, Shimadzu LCMS 2010, and many of Sciex range mass spectrometers (please see specifications). If your favorite MS is not in this list, we will carry out the integration study for you.*



## Architecture

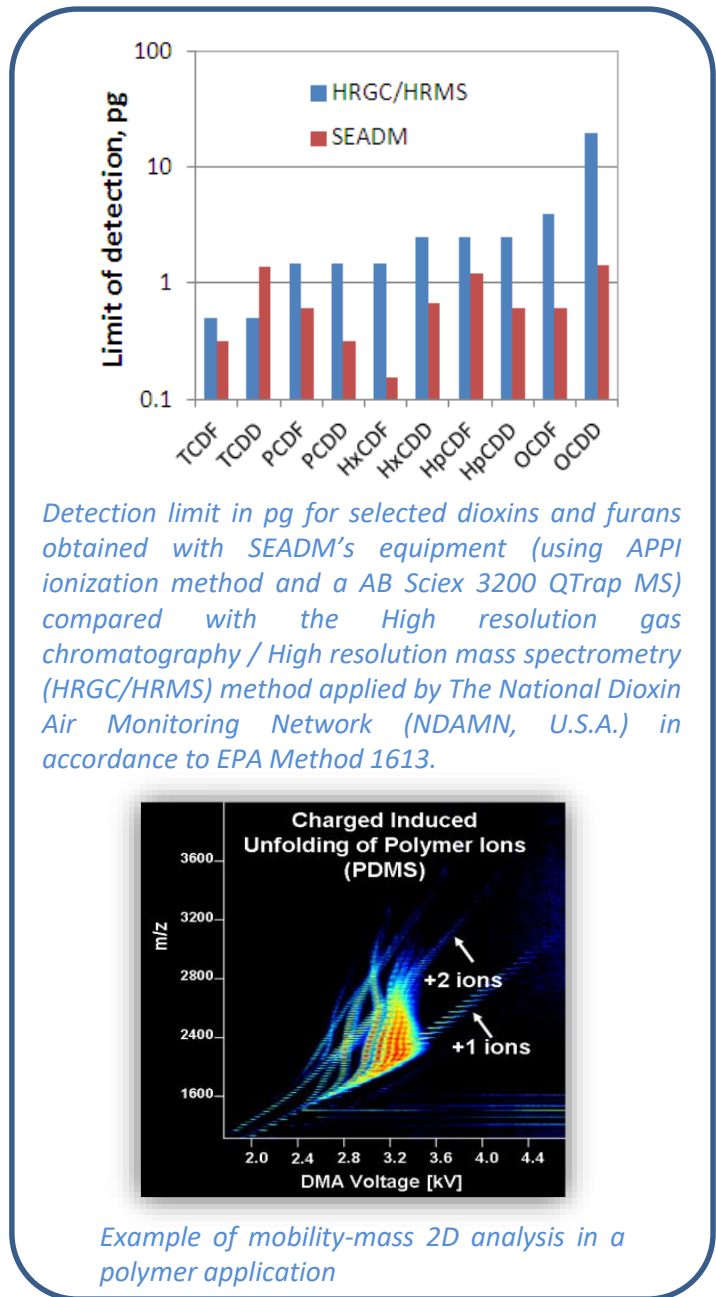
The Front End has been developed as a compact unit and equipped with the latest proprietary ionization and mobility technologies

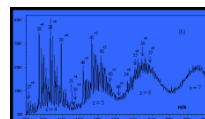


<b>Ionization chamber</b>	Low Flow SESI (LFSESI), which can be used as a vapor charger for gas samples, or operated as a nano-ESI for liquid samples. Our newest D_LFSESI source provides even enhanced performance for vapors avoiding solvation of ions.
<b>Differential mobility analyzer (DMA)</b>	Planar, supercritical type.
<b>Mass spectrometer</b>	A range of SoTA systems can be coupled (see specification sheet for details).
<b>Electronics and controls</b>	The electronics rack is controlled by the operator's software. It fixes the HVDC references for the DMA and the ionization chamber. It accurately controls the temperature of the key elements (DMA recirculation circuit, ionization chamber), and provides the necessary flows at a controlled pressure for stable operation.

## Advantages

- **High resolution:** 100 (peak voltage)/FWMH
- Lowest limits of detection available (1ppq for TNT)
- Compelling advantages for the analysis of **polymers** (specially at moderate and high molecular masses) and **bio-molecules** (true linear mobility delivered).
- Reduced sampling time due to higher sensitivity.
- Accomplishment of measurements in real time (seconds to minutes depending on the application).
- Complex samples can be thoroughly analyzed (including discovery mode) through a **2D mass-mobility** analysis.
- **High versatility:** the Front End **can be disassembled at any time** and leave the MS as a stand alone.
- **Plug in/out to/from** your MS in 5 minutes.
- Robust, **highly engineered construction**, featuring mirror polishing, micro-slots and full thermal control for the maximum standard of reliability.
- Full **support and maintenance** from SEADM.
- Ion mobility measured as sprayed at atmospheric pressure **without any activation**
- And still at a **fraction of the cost** of commercial IMS-MS systems!!





Upgrade your MS to tackle more and more challenging applications!

## INDUSTRY



- Polymer analysis
- Food security and quality
- Bio-based industries

## MEDICINE AND BIOLOGY



- Metabolomics
- Bio-molecules analysis
- Serious illnesses diagnosis
- Pharmacokinetics

## ENVIRONMENT



- Air/soil pollution
- Geological studies

## SECURITY



- Drugs / explosives detection
- Person identification (border checks)
- Industrial security (gas leakages)

Developed in collaboration with  
Juan Fernandez de la Mora at Yale University

## Specifications

<b>Ionization probability</b>	90 % (ESI)
<b>DMA Resolution:</b>	100 (Peak Voltage/FWMH)
<b>Ion transmission:</b>	50%
<b>Tailing Ratio:</b>	$6.5 \times 10^4$ (ideal Gaussian peaks, with no tailing, see J. J. Am. Soc. Mass Spectrom. 2017, 28 (8), 1506–1517 for reference)
<b>MS interfaces available</b>	<b>Bruker</b> Impact HD, <b>Thermo Fisher Scientific</b> Orbitrap, <b>Sciex</b> Qtrap and Triple Quad 3200, 4500, 5500, 6500, <b>Sciex</b> API 5000, <b>Tofwerk</b> API-TOF. If your favorite MS is not on the list we will make the integration for you.
<b>Power</b>	1-phase, 16 A (per line)
<b>DMA Cell dimensions</b>	480 x 102 x 88 (mm)
<b>Weight (Kg)</b>	5.5 Kg (only the DMA)

## SEADM, your strategic partner

We are prepared to actively cooperate with you in your research. Just contact us at:

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