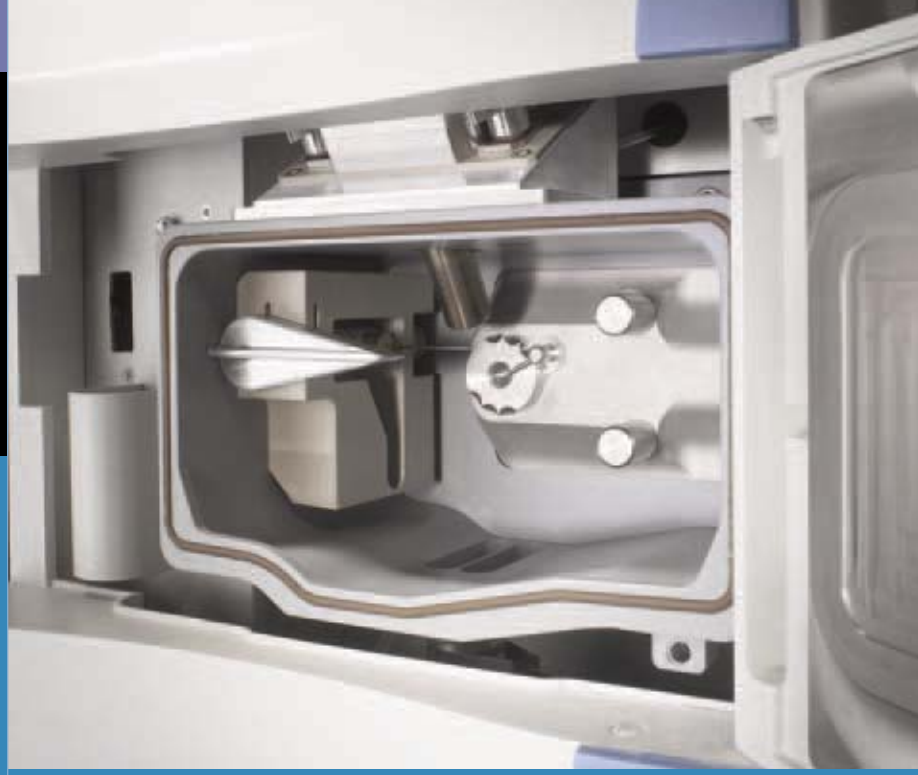
CHROMATOGRAPHY

MSQ Plus™



Advanced MS Detection for HPLC

Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

LC/MS Detection Made Simple

The world's smallest LC/MS detector, the MSQ Plus, provides unsurpassed performance and ruggedness in an easy-to-use, highly sensitive instrument.

Today's laboratory environment requires instrumentation that will operate unattended, while delivering fast, reliable results. The market's smallest and most powerful single quadrupole mass spectrometer, the MSQ Plus, extends detection sensitivity beyond any HPLC detector. Designed to work unattended, it enables accelerated productivity when partnered with the revolutionary Accela high speed LC or the Surveyor Plus™ HPLC.

At a mere 12 inches wide, the MSQ Plus is the smallest single quadrupole LC/MS detector available for HPLC, and the required bench space is forty percent less than any other system on the market. The ultra-compact LC/MS system incorporates the latest cutting edge technology and innovative design, producing unsurpassed performance and ruggedness in an easy-to-use, highly sensitive instrument.

The MSQ Plus is complemented with the Thermo Scientific Xcalibur™ Data System, for unsurpassed ease of use and comprehensive instrument control, MS data analysis and reporting. Xcalibur software addresses data processing requirements ranging from regulatory compliance (21 CFR Part 11), data reporting, quantitation, large and small molecule applications for all users.

The new Accela High Speed LC System uses 1.9 µm column particle technology to achieve high speed, efficient chromatographic separations at conventional LC pressures and up to 15,000 psi.

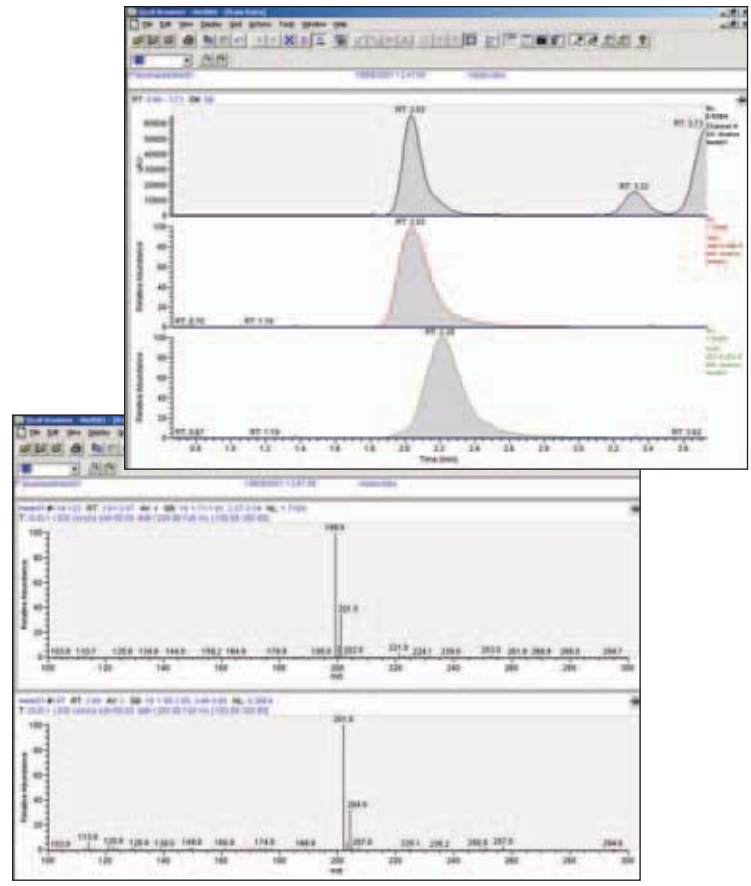
Run Routine Applications More Efficiently

The MSQ Plus helps chromatographers run routine HPLC applications more efficiently. The MSQ Plus provides an excellent platform for sample analysis by offering a quick and clear mass identification for chromatographic peaks.

LC/MS adds additional confidence to your quantitation, enabling you to obtain limits of detection which can be up to 1000 times greater than UV detection. It eliminates the challenges facing the chromatographer using UV detection by:

- Reducing time limitations
- Increasing sensitivity
- Identifying chromatogram peaks with confidence
- Indicating whether any peaks in a chromatogram have co-eluted

Unknown chromatographic peaks can appear during the development and manufacturing of drugs, chemicals, and natural products. LC/MS enables the chromatographer to quickly and effectively suggest a number of possibilities for these unknown peaks. By scanning across a peak, it is possible to detect the appearance of unusual masses. The example below clearly illustrates two compounds co-eluting. By overlaying the individual responses for each recorded mass, it is possible to determine how the compounds contribute to the total chromatographic peak.



UV and mass chromatograms – UV indicates one compound whereas mass chromatograms and spectra clearly show two.

Cutting-edge Technology and Innovative Design

Versatile

Chromatographers do not need to compromise their chromatography in order to gain specific data, because the MSQ Plus integrates seamlessly with an LC system. Robust performance is achieved routinely, even with applications involving ion-pairing reagents, non-volatile buffers and complex sample matrices. It is the ideal detector for the widest range of applications, spanning both normal and reversed-phase HPLC, easily handling eluents from both microbore and conventional columns.

Fast Scan Speed

Scan speeds of 12,000 amu/sec allow more scan events and data collection in less time.

Wide Range of Flow Rates

The MSQ Plus handles 10 µL/min to 2 mL/min in ESI and 0.2 to 2 mL/min in APCI.

Multi-Vendor Support

The MSQ Plus seamlessly interfaces with Accela or the Surveyor Plus HPLC system, as well as many third-party instruments. The cross-platform software suite allows the Xcalibur Data System to directly control these instruments, eliminating the use of multiple programs and computers.

FastLoc Probes

FastLoc™ Probes eliminate complex gas and high voltage connections, enabling rapid switching of ionization modes

RF/DC Prefilter

Square quadrupole RF/DC Prefilter for high efficiency ion transmission and protection of the analyzing quadrupole

M-Path Source Design

M-Path™ sampling system for extreme sensitivity from real samples

Cone Wash

Optimized for dirty samples and salt buffers

Ion Bright Detector

Patented Ion Bright™ Detector generates the greatest signal with the least noise

Autocalibration System

Automatic mass scale calibration and tuning

Advanced Quantitation and Simple Set-up

As a Quantitative Tool

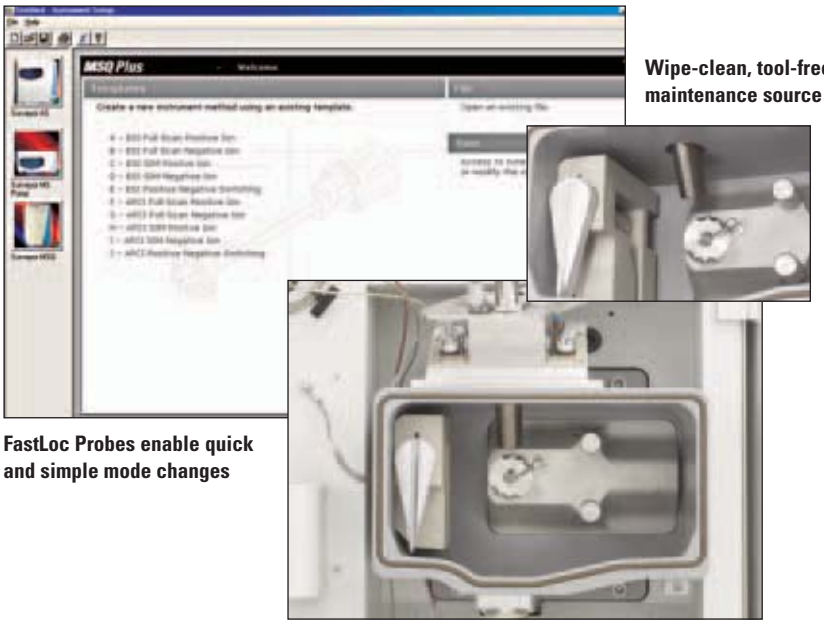
The cost-effective MSQ Plus is designed to provide accurate mass information about specific analytes without the need to be an expert in the details of multi-stage MS/MS.

Simple Set-up

ESI and APCI FastLoc Probes enable quick and simple mode change, while the wipe-clean, tool-free maintenance M-Path source with patented cone wash provides ultra-rugged performance.

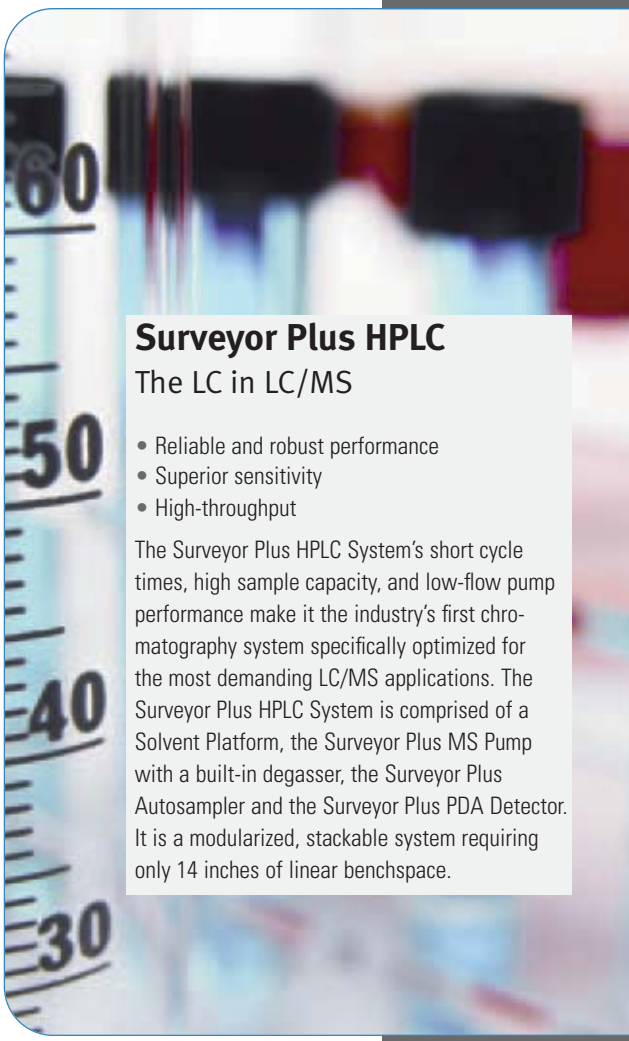
Simple interactive method set-up and point-and-click sequences are available from built-in templates.

Automated instrument set-up requires no user input and has built-in automatic mass scale calibration, along with automatic full system Autotune that completes all required tasks.



FastLoc Probes enable quick and simple mode changes

Wipe-clean, tool-free maintenance source



Surveyor Plus HPLC

The LC in LC/MS

- Reliable and robust performance
- Superior sensitivity
- High-throughput

The Surveyor Plus HPLC System's short cycle times, high sample capacity, and low-flow pump performance make it the industry's first chromatography system specifically optimized for the most demanding LC/MS applications. The Surveyor Plus HPLC System is comprised of a Solvent Platform, the Surveyor Plus MS Pump with a built-in degasser, the Surveyor Plus Autosampler and the Surveyor Plus PDA Detector. It is a modularized, stackable system requiring only 14 inches of linear benchspace.

Performance and Ease-of-Use

API

Atmospheric Pressure Ionization is the most universal interface for LC/MS. With the MSQ Plus, switching between two API modes is quick and easy:

- ESI – Electrospray Ionization provides a rapid, accurate means of analyzing a wide range of polar molecules and can generate multiply charged ions, allowing large bio-molecules to be detected.
- APCI – Atmospheric Pressure Chemical Ionization is ideal for identifying and quantifying a wide range of small organic molecules including many drugs, pollutants, and chemical intermediates.

Speed

The MSQ Plus has a Dual DSP acquisition system that easily handles the fast scanning required for narrow LC peaks. With a scan rate capability of over 12,000 amu per second, more points across your peaks can be acquired to produce better:

- Detection limits
- Resolution of close eluting peaks
- Spectral integrity and accuracy
- Quantitation and better throughput

Excellent Data Quality and Accuracy

Sensitivity

The advanced technology of the MSQ Plus brings industry-leading sensitivity to the smallest LC/MS detector available. The MSQ Plus gives the chromatographer unique flexibility in a wide range of applications. Conventional MS sources are not robust enough to maintain performance for long periods of time in the presence of complex sample matrices or nonvolatile buffers.

Compliance

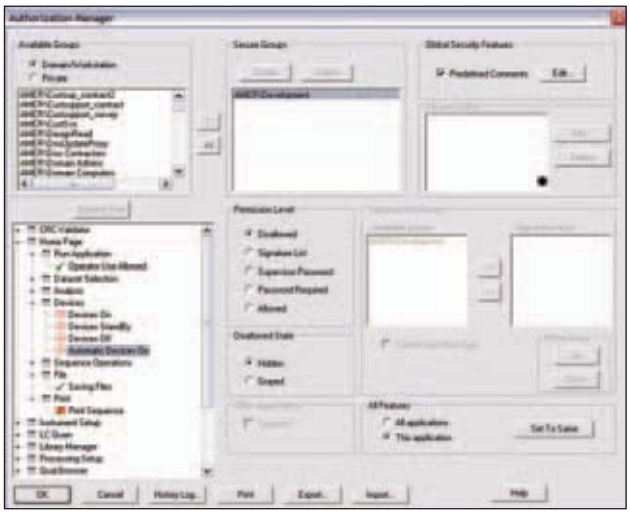
Secure system access, multiple user security, data file integrity, built-in audit trails, electronic signoff and review and more are provided in the new Xcalibur Data System with software control of the MSQ Plus. Users can be assigned into groups with various software rights and privileges for total and secure control of the MSQ Plus. Regulated laboratory operations can easily operate the MSQ Plus in this environment to address 21 CFR Part 11 issues.

Robustness

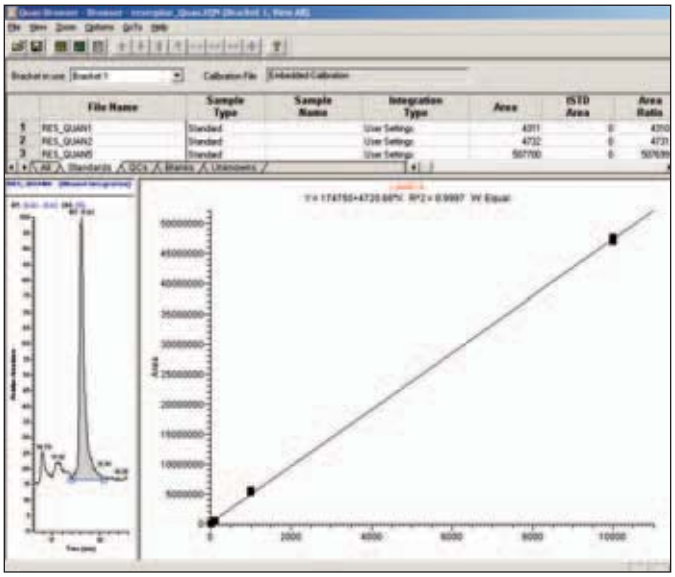
Unlike other instruments, the MSQ Plus features a unique patented cone wash which maintains instrument performance under the most rigorous conditions, reducing the amount of cleanup typical with LC/MS methods. Whether it is high concentration, salts, or dirty sample matrices, the MSQ Plus delivers non-stop quality results.

Dynamic Range

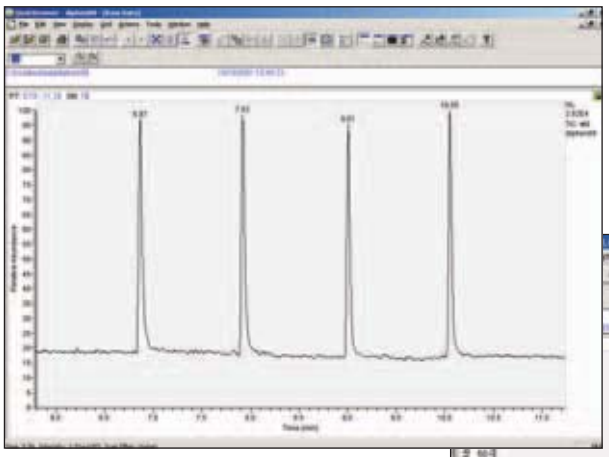
The MSQ Plus has ten times the sensitivity of previous instruments. This, combined with the RF/DC Prefilter and detector system, has produced an instrument with over four orders of dynamic range.



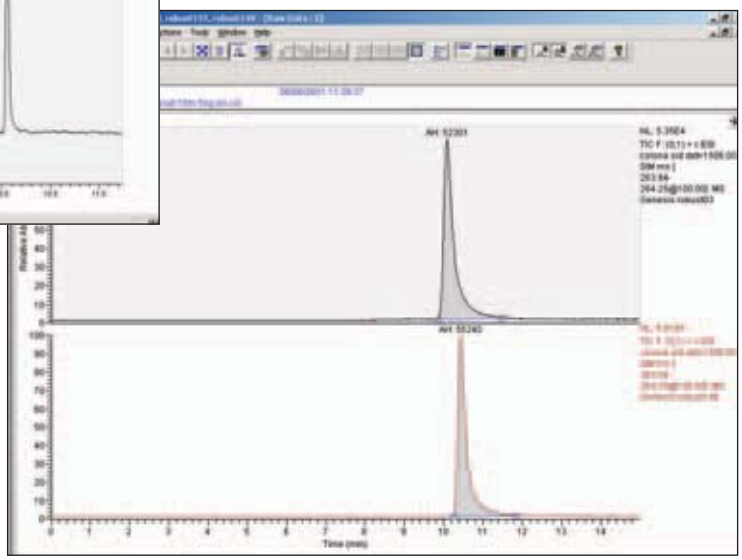
The Authorization Manager allows you to quickly set up groups with sets of privileges.



Reserpine 1 pg – 10 ng demonstrating four orders of dynamics range and excellent linearity.



Four 1 pg injections of diphenhydramine. Demonstrating the superb sensitivity of MSQ Plus in excess of 250:1 RMS.



Robust and reproducible data – day-in and day-out.

More Reliable Drug Development

Discovery – Screening the Fast Way

Discovery™ software provides a completely automated solution for the needs of high-throughput mass screening programs. Specifically developed to fulfill the needs of combinatorial chemists, Discovery is also suited to other applications requiring:

- High-throughput
- Product confirmation
- Purity assessment by diode array, UV, or other detectors
- Microtiter plate sampling

Discovery also controls the full analysis cycle from sample submission to reporting of results, and is compatible with LIMS systems for data archiving and sample tracking. Discovery provides a simple way of processing and viewing high-throughput screening data. Input masses are targeted for each sample, and their presence in the sample is reported in a data browser. Purity can be calculated from UV, PDA, or other detector data.

Increase the Speed and Reliability of Your Drug Discovery

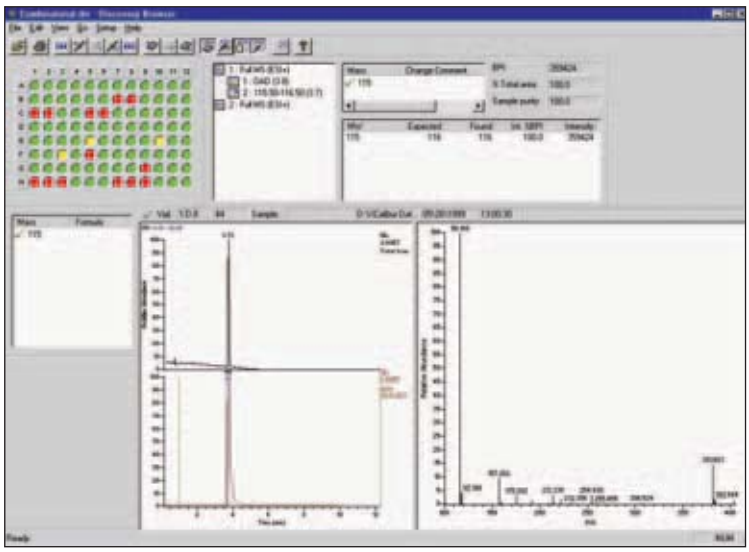
Analytical HPLC methods can be developed faster with reduced run times by combining the sensitivity of the MSQ Plus with the selectivity of your HPLC method. Overlapping peaks detected by UV or other detectors can be fully resolved using the MSQ Plus, resulting in better quantitation and total confidence in assigning peak identity. Lead optimization is made faster by utilizing the power of the MSQ Plus to confirm the structural identity of hits following high-throughput screening, increasing the reliability of your drug development.

Rapid, quantitative LC/MS methods are ideal for investigating metabolism and stability of compounds in preclinical and clinical development.

The wide linear range, sensitivity, and selectivity of the MSQ Plus makes it the detector of choice for pharmacokinetic assays. Better pharmaceutical QC, coupled with your automated HPLC and the MSQ Plus, provides the most reliable LC/MS system. The robust quadrupole detector gives the accurate quantitation that is needed for pharmaceutical QC. Its ability to rapidly generate an interpret 'fingerprints' provides the necessary data to confirm peak purity or compare product batches.

Open Access

Open Access™ is designed as a walk-up interface to the MSQ Plus for synthetic chemists. It allows samples to be run and qualitative results printed or emailed to the user without any prior knowledge of mass spectrometry or the software. Utilizing the full functionality of the MSQ Plus (e.g. polarity switching, multi-mode methods), the system administrator can set up MS, LC, and reporting methods which are then available to the chemist at the point of Sample Login. Open Access enables chemists without specialist training in mass spectrometry to log samples for acquisition, processing, and reporting. An Open Access system has a supervisor and one or more defined operators. The supervisor is responsible for the day-to-day operation of the instrument and Open Access network. An operator logs samples into the Open Access system for automated processing.



The Discovery browser provides an intuitive and informative interface for graphic and written confirmation of your sample.

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