

  
**scion**  
INSTRUMENTS



## **SCION SQ Series GC-MS**

- The Gas Chromatographers' Detector

# SCION SQ™ GC-MS

The SCION SQ series GCMS systems combine innovative engineering with detailed customer requirements to produce a truly innovative system. The SCION SQ series. By designing the GC-MS systems to exceed the most critical performance and reliability needs of GC users, Scion Instruments has delivered systems that are especially for, and all about, the ultimate success of the GC users. The SCION SQ Select and Premium models are designed to meet many important user specific requirements – reliable performance, ease-of-use and simple maintenance – all in a small footprint that saves valuable bench space.



## SCION SQ GC-MS Benefits

### Easy to Use and Maintain

- Simple tuning due to “lens-free” ion-path design
- No multiplier calibration required

### Robust

- An inert ion source that requires less frequent cleaning

### Sensitive

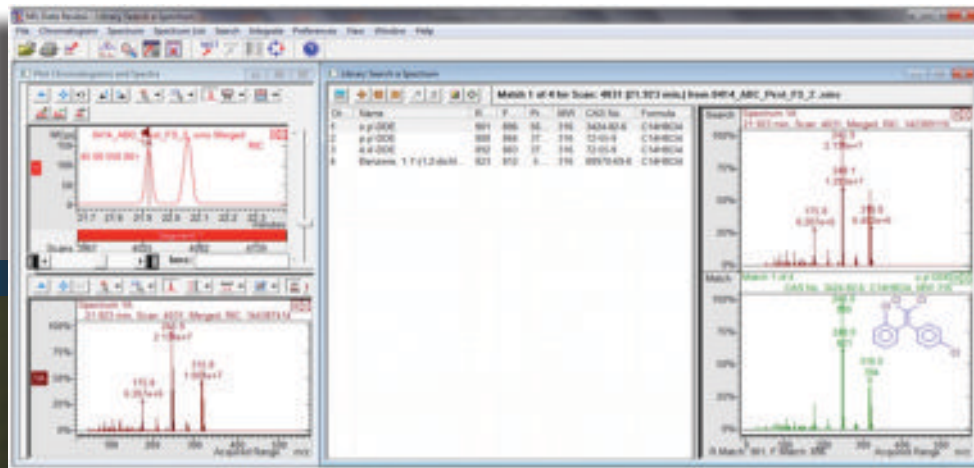
- Optional active-focusing q0 uses He atoms to focus ions



## ● Enhanced Library Searching through Cleaner EI Spectra

The SCIION SQ models are designed to analyze thousands of samples from complex matrices. With an upper mass limit of  $m/z$  1200, they are exceptionally capable of handling almost any GC application. The innovative lens-free design, combined with the robustness of the axial ion source, delivers unmatched stability and ultra-high sensitivity on a routine basis.

- One-click search of multiple spectral databases
- User-created spectral libraries and full support of spectral libraries such as NIST, Wiley, and Maurer/Pfleger/Weber (MPW)
- Adjustable spectral search parameters to streamline library searches
- Automated workflow to build a SIM method from a full scan data file
- Flexible and easy to use



Flexible and powerful library search showing matching of sample peak to o,p'-DDE in the NIST library

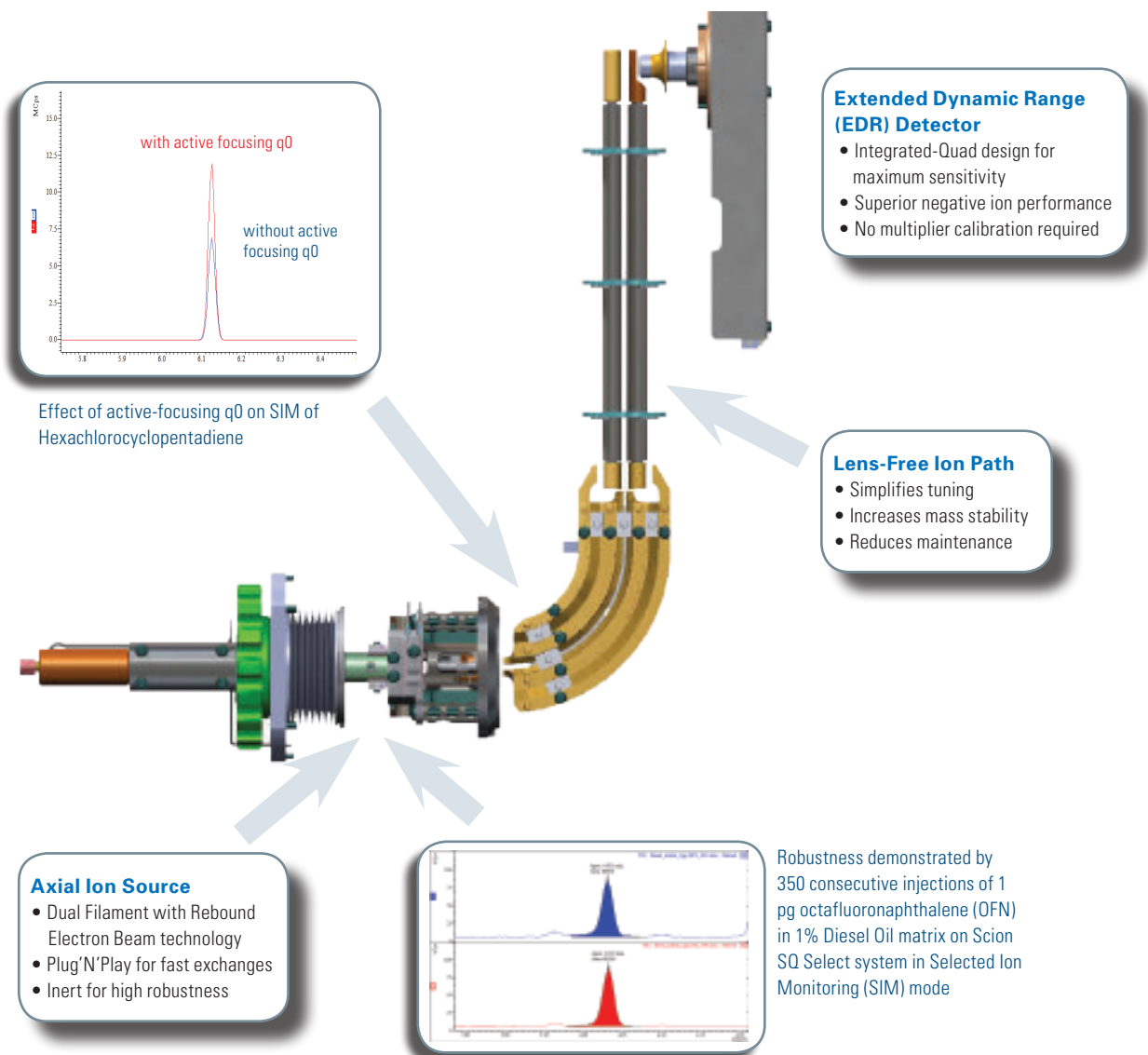


# Why Choose the SCION SQ?

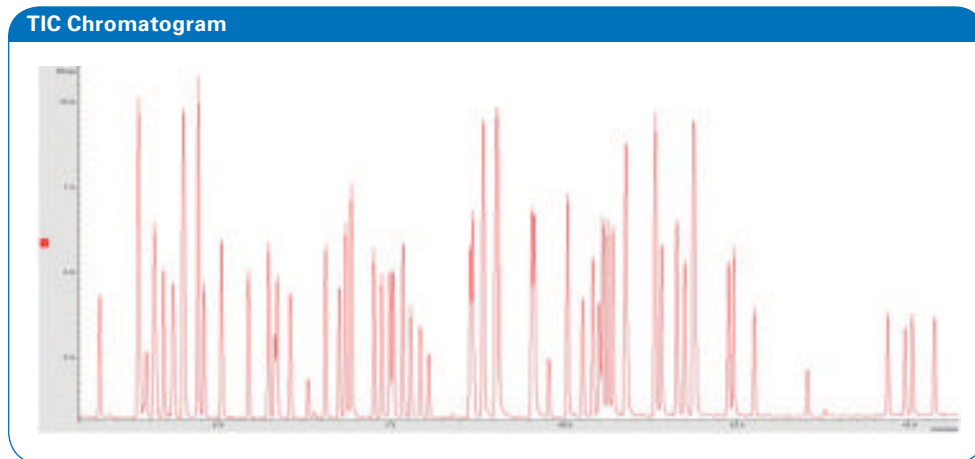
The SCION SQ series delivers exceptional performance for a single quadrupole mass spectrometer: a robust axial ion source, ultra-high sensitivity, cleaner spectra, and virtually-zero neutral noise. The series includes the SQ Select, Prime, and Premium GC-MS models.

For routine EI-only applications, the **SCION SQ Select** delivers the best value. It comes with an industry leading 400 L/s high-capacity turbo pump that enables fast pump-down time for quick maintenance, and the use of high carrier gas flow for fast GC separations.

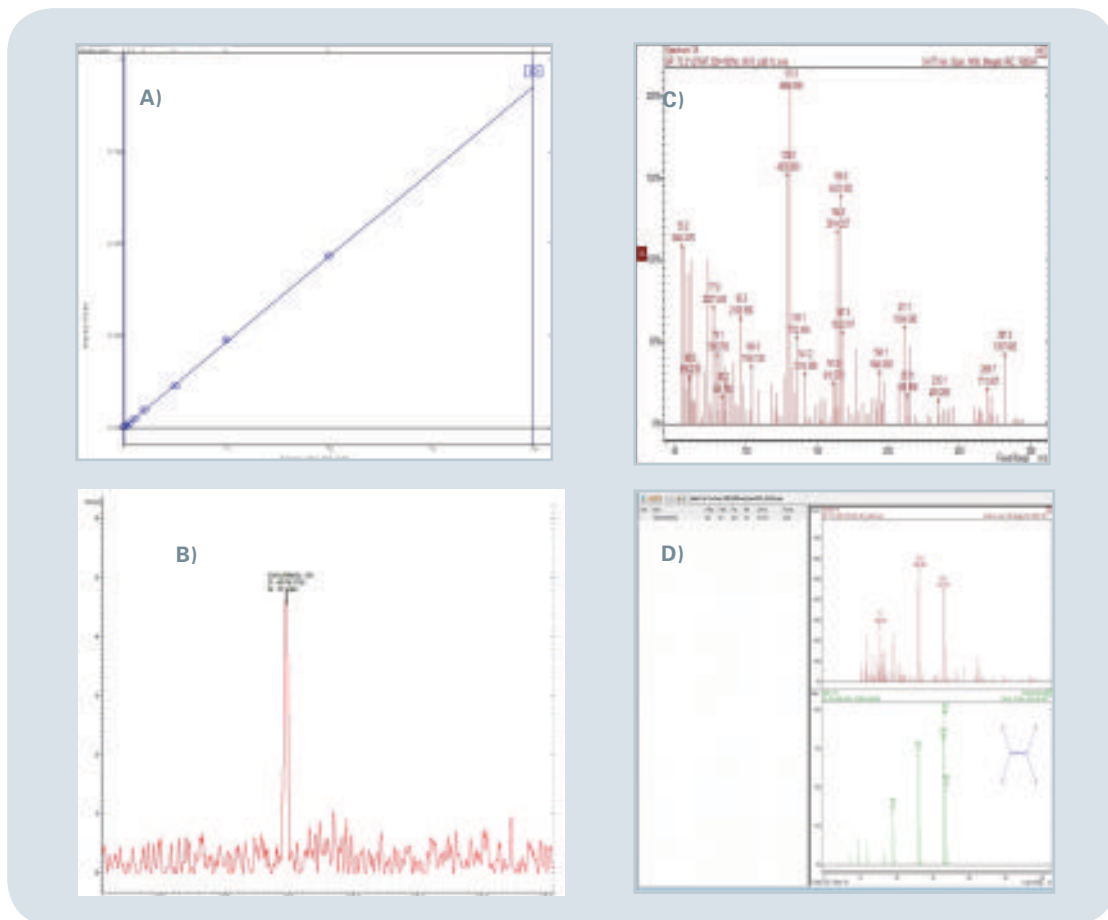
The **SCION SQ Premium** model comes CI-ready and therefore is the most versatile GC-MS SQ platform. The active-focusing q0 optic is heated for the demanding analysis that requires the ultimate robustness.



● Linearity, Sensitivity, and Spectral Matching Using the SCION SQ for US EPA Methods



TIC chromatogram of a 5 mL water sample containing 84 VOCs at 10 µg/L (ppb) by US EPA Method 524.3



(A) Excellent linearity of Tetrachloroethylene from 0.1 to 40 ppb with the purge-and-trap, (B) good sensitivity, (C) high quality spectra, (D) down to 0.1 ppb level and showing good match to the NIST library.

# Gas Chromatographs

## An Infusion of Innovation with a Legacy of Reliability

The GC is a key part to the reliability, robustness, and sensitivity of any GC-MS analysis. Scion instrument's philosophy of innovation is highlighted by the introduction of two new GCs built to support the ultrasensitive SCION SQ. The compact SCION 436-GC and the versatile SCION 456-GC can accommodate two columns in the oven and are available with new backflush technology and the innovative ChromatoProbe™. The new GCs are also equipped with the multi-language touchpad display supporting 13 languages and enabling MS control.

### SCION 436-GC

Compact design for those focused on routine applications requiring maximum throughput utilizing Split/Splitless (SSL) or Programmable Temperature Vaporization (PTV) injectors

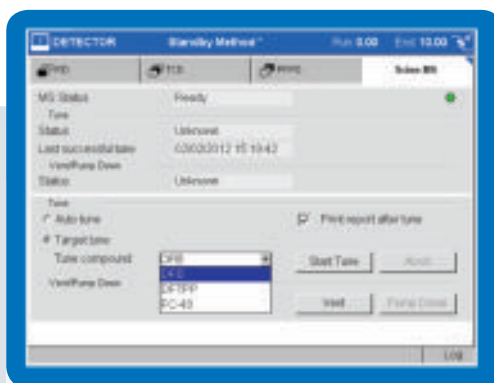
- Select up to 2 capillary inlets: SSL or PTV
- Support one GC detector and the mass spectrometer
- High precision electronic pressure control
- All temperature zones up to 450 °C
- Automated with Model 8400/8410 or CTC liquid autosampler

### SCION 456-GC

Versatile design with additional injector and detector options for laboratories seeking multipurpose analysis utilizing both GC and GC-MS

- Support up to 3 injectors-SSL, PTV, cold On-column, and Purge-Packed
- Add up to 3 GC detectors-FID, ECD, TCD, PFPD, NPD (TSD)
- High precision electronic pressure control
- All temperature zones up to 450 °C
- Automated with Model 8400/8410 or CTC liquid autosampler

Scion Instruments has now set the industry standard for ease-of-use: Basic operation of SCION GC-MS systems can be directly controlled from the multi-language touchpad on the gas chromatograph. Automatic tuning, along with tune-to-target for meeting specific USEPA methods can be done with a touch of a button. And the MS can be vented and pumped down from the interface for the ultimate in easy maintenance.



SCION 436-GC



SCION 456-GC

## ● Additions to Enhance System Capability and Performance

### SHS-40 Automated Headspace Sampler

- Perfect for analyzing VOCs in solid or liquid samples
- 40/125 sample capacity – Crimp cap or screw cap 10 or 20 mL vials
- 12 position oven for increased throughput
- 200 °C sample heating for extended range
- Injection with 1 mL sample loop, designed for EPC GCs MHE mode via single puncture ensuring no leaks

### PTV Inlet with Back flush

The perfect addition for the SCION SQ PTV inlet is the backflush option. Complex sample matrix can quickly ruin the chromatographic performance of your GC column. However, the PTV with Scion Instrument's "backflush" technique can reliably divert the higher boiling sample matrix away from the column. The benefits of this accessory are many:

- Run more samples per day – decrease analysis times as the heavy components are quickly eliminated
- Save time by eliminating column bakeout
- Preserve column performance for extended period of time

### ChromatoProbe™

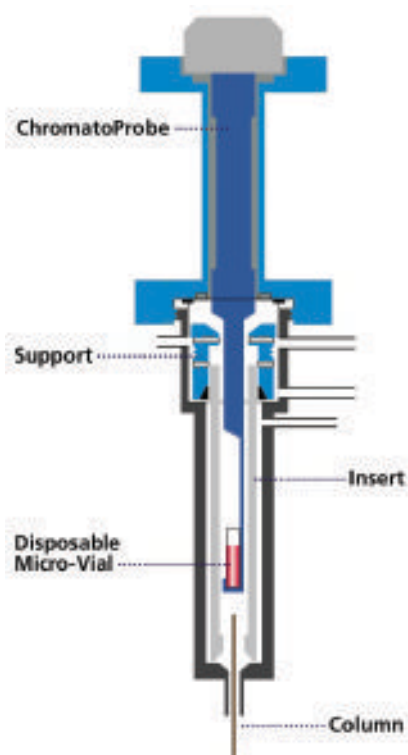
Added versatility for superior analysis of solids, liquids, and slurries

Compounds such as street drugs, industrial solids, synthetic organic products, and plant tissues that normally are not considered amenable to GC-MS analysis can be easily investigated with the ChromatoProbe.

Samples are introduced into the PTV injector via disposable micro-vials. Non-volatile or thermally degraded components from the sample remain in the micro-vial allowing the system to remain clean.

ChromatoProbe benefits:

- Increase uptime
- Minimize system contamination with disposable micro-vials
- Directly desorb samples in the PTV injector without added hardware





[www.ScionInstruments.com](http://www.ScionInstruments.com)

For research use only. Not for use in diagnostic procedures.

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# • SCION SQ GC Quadrupole Mass Spectrometer

## Specification Sheet

The SCION SQ Select and Premium GC-MS systems are the chromatographer's choice for quadrupole mass detector; they are designed to match your most stringent needs for analytical performance and productivity. The SCION SQ series offers superior sensitivity and robustness based on innovative ion optics, and fast and easy methods development. These SCION SQ GC-MS systems define a new standard of usability for routine analysis.

### Analyzer - MS Specifications

- Scan modes: Full Scan, Selected Ion Monitoring (SIM), Combined Full Scan-SIM
- Standard ionization mode: Electron Ionization (EI)
- Optional ionization modes: Chemical Ionization (CI) including PCI and NCI on Premium model
- Ion source: Auto-aligning EI or CI (optional) sources constructed of inert materials
- q0 ion guide: 90° curved RF-only entrance quadrupole with active ion beam focusing and heating at 135 °C (Premium model only)
- Source temperature: 100 °C to 350 °C
- Filament and emission current: dual filaments; up to 200 µA
- Electron energy: adjustable from 0 to 150 eV
- Mass filter: quadrupole with pre- and post-filter; high ion transmission efficiency lens-less design
- Mass range (m/z): 1 to 1200 Da
- Scan rate: up to 14,000 Da/sec
- Minimum scan time (dwell time): 1 ms
- Resolution: user adjustable from 0.7 Da (Unit) to 4 Da, also with three user-selectable settings (Unit, Standard, Open)
- Mass axis stability: <math>\pm 0.1</math> Da over 48 hours
- Transfer line temperature: up to 350 °C
- Manifold temperature: 40-50 °C
- Detector: Electron multiplier with  $\pm 5$  kV post acceleration and with on-the-fly multiplier gain optimization for Extended Dynamic Range (EDR™); direct ion collection onto multiplier for negative ion detection without dynode loss
- Turbomolecular pump: dual stage, 310/400 L/sec, air-cooled for helium carrier gas flow up to 25 mL/min (Premium model)
- Turbo molecular pump, single stage, 400 L/sec, air-cooled for helium carrier gas flow up to 25 mL/min (Select model)
- Foreline pump: dual-stage rotary vane; voltage 120/230V
- Power requirements: 100-240 Vac, 50/60 Hz  $\pm 3$  Hz, 1200 VA
- Operating environment temperature: 15 °C to 33 °C
- Operating environment humidity: 20% to 80% relative humidity (without condensation)

### Software

- Bruker MS Workstation for data acquisition, data handling, and reporting
- Optional Spectral Libraries: NIST, Wiley, and Maurer/ Pflieger /Weber (MPW) libraries with user-customizable libraries and automatic searching of multiple libraries
- Autotune in all ionization modes, special tunes for EPA methods (DFTPP/BFB)

### Gas Chromatograph (Scion 436 and 456 Model GC)

#### For more specification on GC, refer to the GC Data Sheet

- Injectors: Split/Splitless (SSL), Programmable Temperature Vaporization (PTV), Cold-on-Column (COC), etc. Back-flush option available for all injectors.
- Autosamplers: CP 8400; CP 8410; CTC PAL COMBI-xt; CTC PAL GC-xt
- GC Oven Temperature: Ambient+4 °C to 450 °C, -100 °C to 450 °C (with Liquid N<sub>2</sub>); -60 °C to 450 °C (with Liquid CO<sub>2</sub>)
- Temperature Ramps/Holds: 24/25
- Pneumatic: Electronic Flow Control (EFC) or Manual (456)
- ChromatoProbe™: Direct introduction of solids, liquids or slurries (requires PTV injector)
- MS tuning, tune-to-target, pump-down, and venting controlled by the multi-language touchpad on the GC.

#### Performance Specifications\*

Mode	Test (with SSL injector in hot splitless mode)	Specification†
EI Full Scan	1 pg Octafluoronaphthalene (OFN) from m/z 50 to 300 for m/z 272	S/N ≥1500:1
PCI Full Scan ‡	100 pg Benzophenone (BZP) from m/z 80 to 230 for m/z 183	S/N ≥600:1
NCI Full Scan ‡	200 fg OFN from m/z 200 to 300 for m/z 272	S/N ≥1000:1

\* All tests performed with helium at carrier gas

† The Signal-to-Noise ratio S/N values are based on RMS

‡ Premium Model only, CI tests use methane as reagent gas

#### Dimensions (H x W x D) and Weight

##### Additional spaces should be added for the data system, monitor and printer

- SCION SQ: 45 cm (18 in.) x 28 cm (11 in.) x 57 cm (22.5 in.), 37 kg/82 lb
- 436 GC: 57 cm (23 in.) x 32 cm (13 in.) x 61 cm (24 in.); 27 kg/59 lb
- 456 GC: 57 cm (23 in.) x 66 cm (26 in.) x 56 cm (22 in.); 43 kg/95 lb
- CP-8400/8410 Autosamplers: 40 cm (16 in.) x 22 cm (9 in.) x 47 cm (18 in.); 7 kg/15.3 lb