Software for Hiden Mass Spectrometers

Gas Analysis, Thermal Analysis and Residual Gas Analysis

Including application specific software packages for:
Quantitative gas analysis
Evolved gas analysis – TA-MS
UHV -TPD
MASsoft PC software for Win 10 software provides for data acquisition and control of Hiden quadrupole mass spectrometers - QMS.

Quick set up and start with easy scans, simple template set up for automated operation and scan editor for manual operation

Trend analysis, Histogram and Peak profile and Leak detect scans. Data display in tabular and/or graphical formats

QMS Parameters are tuneable on the fly. Data is automatically saved, and can be exported on the fly and/or post acquisition.
Mass Spectrometer – easy start

- Pre set modes of operation, templates and full control of mass spectrometers parameters
Trend Analysis

• Unlimited number of mass channels
• Full mass spectrometer control on a per channel basis
• Automatic mass peak selection from on board user editable library
• Quantitative analysis with user editable algorithms
Quadrupole Mass Spectrometers for Advanced Science

MASsoft Professional Control Software

Temperature Programmed Decomposition of Composite of HPW+Ascorbic Acid with HPR 20 R&D

<table>
<thead>
<tr>
<th>Parameters/Scans</th>
<th>mass 18</th>
<th>mass 28</th>
<th>mass 32</th>
<th>mass 40</th>
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Mass Spectrometer – mass scanning -1

- Histogram scanning mode
- Extract trend analysis for any mass peak(s) within the scan
- New 4, 6 or 8 decade dynamic range scan
Mass Spectrometer – mass scanning

- Optimised multistage analysis - configure different analysis for different parts of the experiment
- Peak profile diagnostic mode
Trend view from mass scans, profile or histogram

Extracted data from multiple profile scans to trend view in live view and or in post processing.

Spreadsheet type tabular data display with options for user entry of simple formulae for display of derived values by: ratio for example, Mean, std deviation and many more.
3D data views

MASsoft PC Win 10 software
Provides 3D views of mass spectra

3D views are ideal for display of multi-variable scans
APSI-MS: appearance potential soft ionisation mass spectrometry

*APSI-MS Soft ionisation is used to eliminate spectral overlaps by reducing mass peaks from molecular species. For example: The OH⁺ peak at mass 17 is not produced when water vapour is ionised at < 18eV. Under soft ionisation, only the H₂O peak at mass 18 is produced, allowing a species like ammonia to be analysed with a unique peak at mass 17, and without interference from the amount of water vapour present.
MASsoft PC software includes
Automatic peak identification and automatic analysis

Tools for analysis include:

- Library groups edited and selected to be appropriate for the application
- Peak identification – colour coded to indicate library match.
- Spectral simulation and subtraction tools providing difference spectra for comparison to recorded data
- Parameter control to set thresholds for peak inclusion.
Library groups – enables application specific peak identification.

Users select and edit library groups to match the analysis application.

Default library groups include:
Scan example sampling air

Peak identification and Auto Analysis functions
The automatic peak identification finds the air peaks
Complex example.
The automatic peak identification finds and identifies the possible species.
Analysis Report - pdf

The report includes:

Species with % composition.

Identified peaks in the recorded data.

Stacked peaks in graph/table.

Accuracy of the analysis. The mean square error value is reported. This is a confidence factor for the accuracy of the analysis.

The analysis report is exported as a PDF.
Quadrupole Mass Spectrometers for Advanced Science

MS Control

- Pre set modes of operation, templates and full control of mass spectrometers parameters
Quadrupole Mass Spectrometers for Advanced Science

MS Control

Fully editable scan sequence with selectable: scan mode, detector and mass spectrometer parameters set individually for each scan in the sequence.

Events provides control of:
- Alarm set points.
- Data I/O.
- Multiple data functions including: real time display of derived values, ratio, end point, and calibration for example.
Mass Spectrometer Interface Unit

- Ethernet TCP/IP, USB and RS232 communication links
- I/O subsystem with:
  - multi protocol RS485 links for external devices, mass flow controllers, CO analyser, total pressure gauges for example.
  - 5 channel TTL for process control / automatic start - stop trigger
  - Analogue inputs and analogue signal output options
Application specific software packages offered with simplified user interfaces for:

- QGA – Quantitative Gas Analysis
- EGAsert
  Evolved gas analysis
  TA-MS and UHV -TPD
- iRGA – Residual Gas Analysis
QGA – Quantitative Gas Analysis

- Quantitative gas analysis of up to 32 gases
- 10 peak spectral library with intelligent library scan feature
- Flexible major and minor component gas calibration with background correction
- Data view with three y axes for simultaneous display of quantitative data, corrected data and raw data and/or external signals temperature data for example
- Capability to read multiple inputs, temperature or pressure for example

- X-axis can display time or an external input, a temperature ramp for example
- Data inputs for external gas analysers, a CO analyser for example to compliment the mass spectrometer analysis
- Multi-stream analysis for automatic sequenced analysis of up to 80 connected gas streams
- Automatic triggering of the start of analysis from an external input
- OPC data output

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EGAssoft – Evolved Gas Analysis

EGAssoft provides for data acquisition and analysis for TA-MS, TPD and UHV- TPD. Integration with TGA systems including auto stop/start trigger and data export.
iRGA – simplified RGA for vacuum monitoring

The common residual gas and vapour Species are monitored together with a colour palette to indicate status:
Blue = Low
Green = Normal
Red = High

Simplified RGA program with alarm monitoring, leak detect mode, user selected gases, and graphical trend view.
Summary

Hiden MS PC Win 10 software delivers:

• Fast start – simple operation
• Complete control of MS parameters
• Multi stream analysis
• Quantitative analysis: with automatic spectral overlap and background correction
• 3D plotting for evolved gas analysis
• Signal inputs, process control, OPC and data export

• MASsoft Included With all Hiden QMS
• EGAssoft
• QGA
• iRGA