HIDEN ANALYTICAL

Mass Spectrometers for Gas Analysis

MASS SPECTROMETERS
Systems for Gas Analysis Applications

Hiden Analytical offers a versatile range of gas analysis systems, designed for real-time, precise detection of multiple gas and vapour species, with dynamic measurement capabilities from ppb levels to 100% concentration.

With over 40 years of expertise, Hiden Analytical is renowned for designing and developing top-quality quadrupole mass spectrometer-based systems. Our instruments are recognised for their superior sensitivity, accuracy, and reproducibility, supported by a global service and applications network that ensures exceptional customer support.

Our gas analysis systems are capable of analysing an extensive array of gases and vapours, including hydrogen, ammonia, argon, carbon dioxide, methane, nitrogen, oxygen and many more.

Recent advancements in quadrupole mass spectrometry, such as APSI-MS, offer enhanced capabilities:

- **Soft Ionisation:** Simplifies the analysis of complex spectra with precise ion source control, enabling accurate electron energy adjustment from 0.4 eV to 150 eV.
- **High Abundance Sensitivity:** Triple-filter technology minimises peak tailing for improved sensitivity and accuracy.

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Gas Analysis Systems

QGA 2.0 – Quantitative Gas Analyser

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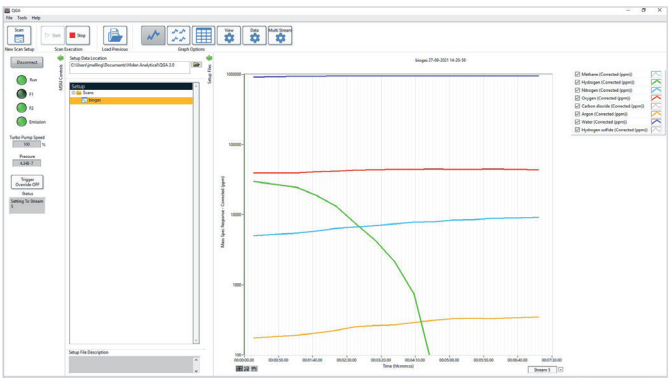
Software

QGAsoft SOFTWARE – for Quantitative Gas and Vapour Analysis

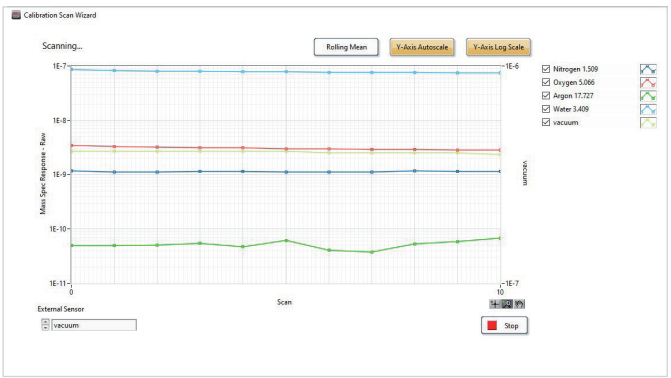
EGAsoft SOFTWARE – for Evolved Gas Analysis

MASsoft PROFESSIONAL SOFTWARE – Control Software

QGA 2.0
Quantitative Gas Analyser



QGAsoft Software Homescreen



QGAsoft Software Calibration

The QGA 2.0 is a full update of our popular QGA system, incorporating significant enhancements for improved performance and ease of use. The QGA 2.0 is lighter, more user-friendly, environmentally considerate, and packed with powerful features.

With a compact design that reduces both its footprint and weight, this advanced model has been optimized for continuous analysis of gases and vapours in near atmospheric pressures. To suit diverse research demands, a range of inlet accessories and configurations are available for sampling from ambient pressure up to 30 bar.

The Hiden QIC (Quartz Inert Capillary) sampling interface sampling from 100 mbar to 2 bar is included as standard. The flexible 2 m QIC capillary inlet operates at up to 200°C and provides response times under 300 milliseconds for most common gases and vapours, including water and organics.

The QGA 2.0 system has a mass range of 200 amu (300 amu option) and a detection capability from 100% to less than 100 parts-per-billion.

The QGA 2.0 system connects to a range of backing pump options including a high-performance scroll pump. For flexibility the QGA will operate with foreline connection up to 10 m.

FEATURES:

- Lightweight - 22% lighter
- Compact – 42% smaller footprint
- Sustainable – uses fewer materials in construction
- Simplified - 1-button start-up
- Versatile – compatible with a selection of inlets
- Optimised – for hydrogen analysis
- Advanced – new electronics package
- Speed – up to 1000 measurements per second
- Intuitive – QGAsoft software package

QGA 2.0 - Quantitative Gas Analyser

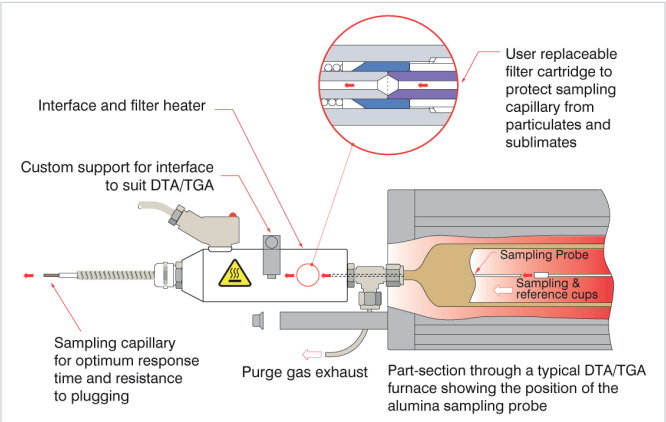
HPR-20 EGA
for Evolved Gas Analysis in TGA-MS

HPR-20 EGA

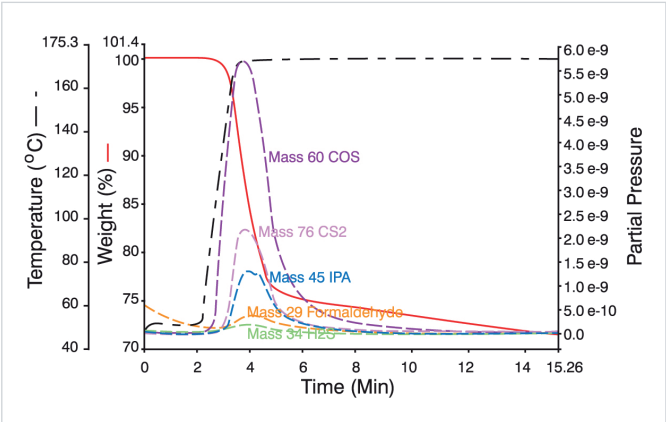
The Hiden HPR-20 EGA gas analysis system is configured for continuous analysis of evolved gases and vapours from thermogravimetric analysers (TGA). Interfaces are available for most TGA instruments and features re-entrant furnace sampling for optimized analysis. The TGA interface provides close coupling to the TGA furnace region for high sensitivity evolved gas/vapour analysis.

Custom designed interfaces are available for special requirements with alternative systems being offered for applications requiring direct sampling from advanced thermogravimetric analysers operating at pressures up to 30 bar.

Fast response, low dead volume interfaces are offered for the most popular TGA equipment.



Typical **TGA** inlet

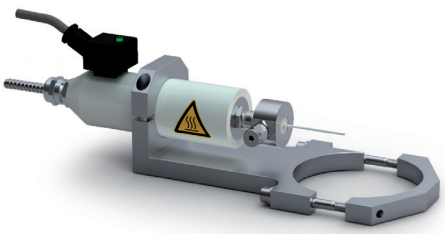


TGA-MS plot

FEATURES:

- Enhanced pumping for light gases
- Heated inlet for non-tailing response to desorbed gases and vapours
- Control of ionisation energy parameters for simplification of cracking patterns
- Custom, low dead volume interface to specific manufacturers' TGA systems
- Optimised data acquisition using EGAsoft
- Mass range option 200 or 300 amu

Each interface has been custom engineered in collaboration with TGA manufacturers and includes, where necessary, robust clamping arrangements and an in-line heated filter assembly between the outlet of the TGA and the MS capillary inlet.



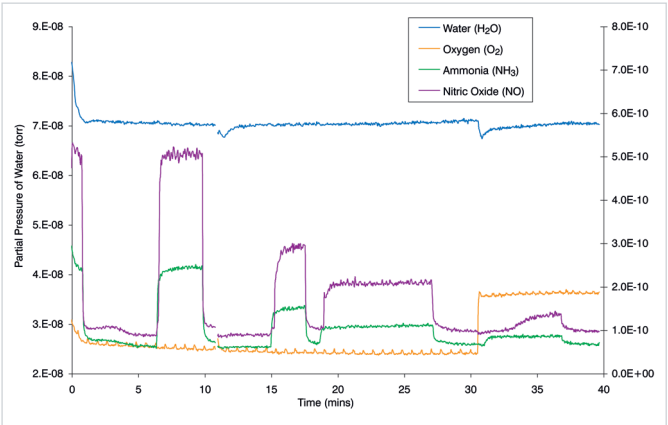
HPR-20 R&D
for Advanced Research

The Hiden HPR-20 R&D specialist gas analysis system is a benchtop mass spectrometer for the monitoring of evolved gases and vapours. A triple filter mass spectrometer is included providing improved resolution and abundance sensitivity with an ultimate detection limit of 5 ppb subject to spectral interference.

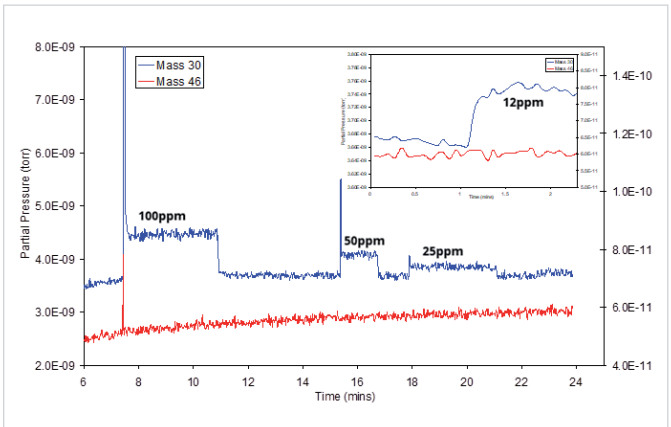
The HPR-20 R&D is offered with a wide range of interfaces for connection to external equipment and is configured with Hiden's heated Quartz Inert Capillary (QIC) for continuous sampling of gases and vapours.

Backing and bypass pumping is provided by a high performance scroll pump. Gas sampling is continuous with a gas sample flow rate user configurable in the range < 1 ml/min to > 15 ml/min.

HPR-20 R&D



Simultaneous measurement of low ppm levels of ammonia, nitric oxide and oxygen in percentage (2%) concentrations of water. Primary Axis represents Partial Pressure of Water (H_2O). Secondary Axis represents Partial Pressure of Oxygen (O_2), Ammonia (NH_3) and Nitric Oxide (NO)

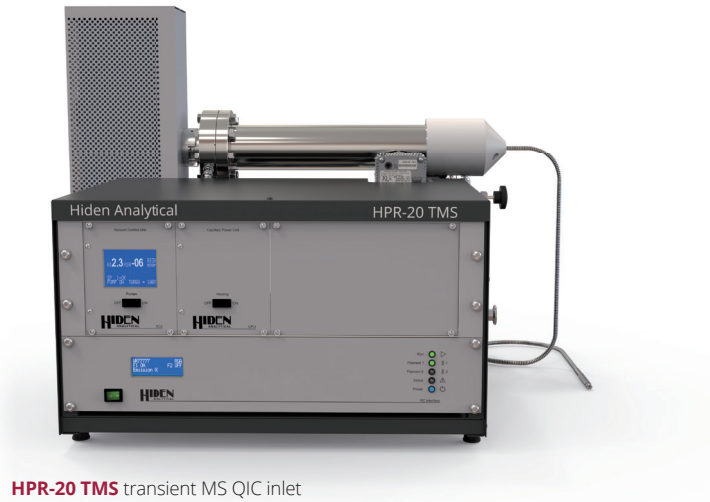


Detection Limit of NO in 1000 ppm NO_2 (Inset: Expansion of detection of 12 ppm NO in 1000 ppm NO_2). Primary Axis represents Partial Pressure at m/z 30, Secondary Axis represents Partial Pressure at m/z 46

FEATURES:

- Triple filter mass spectrometer
- Mass range options: 200, 300 or 510 amu
- Enhanced abundance sensitivity
- Detection to 5 ppb
- APSI-MS soft ionisation mode

HPR-20 TMS
Transient MS for Fast Event Gas Analysis

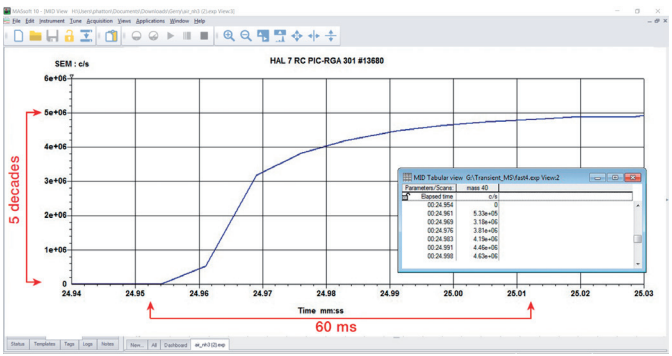


HPR-20 TMS transient MS QIC inlet

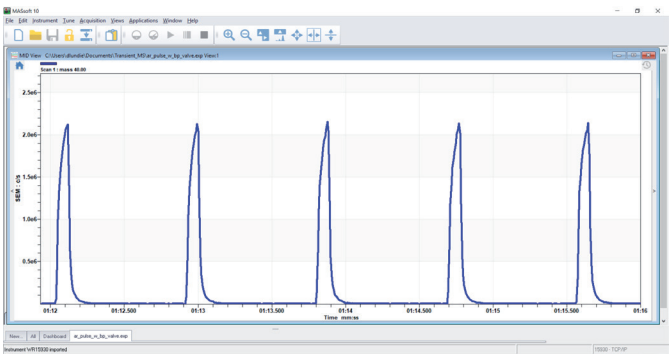
The Hiden HPR-20 TMS Transient MS is configured for fast event analysis of gases and vapours at pressures near atmosphere. Ideal for fast gas switching experiments, the MS features the Hiden QIC quartz-lined 0.9 m sampling interface. The inlet, operating at up to 200°C, provides response times of less than 150 ms to changes in gas composition with a 5 decade response time in < 100 ms.

The QIC inlet is coupled directly to Hiden's Pulse Ion Counting (PIC) digital MS which is capable of measurement speeds of up to 1000 data points/s over the entire 7 decade dynamic range.

Suited to fast data acquisition in the measurement of gas and vapour compositions in the sub ppm to low % concentration range.



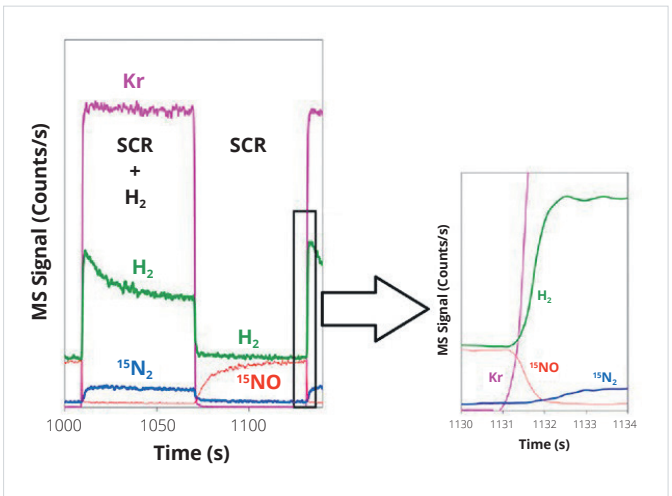
HPR-20 transient MS data: > 5 decades response in < 100 ms



Analysis of fast gas pulsing experiments

FEATURES:

- 0.9 m fast response QIC capillary - 150 ms response time
- Open ion source and optimised pumping configuration for fast response
- Digital PIC detector - 7 decades continuous dynamic range
- Detection of low ppm to high % levels in < 100 ms
- Fast scan speeds, 1000 data points/s for transient analysis



Mass spectrometer response for $^{15}N_2$, ^{15}NO, H_2 and Kr when switching 0.72% H_2 in and out of a SCR (NO_x with octane) feed stream over a catalyst at 300 °C (J. P. Breen, R. Burch, C. Hardacre, C. J. Hill and C. Rioche, J. Catal., 2007, 246, 1-9).

HPR-20 RANGE
for Specialist Applications

The specialist range of Hiden HPR-20 gas analysis systems are configured for continuous analysis of gases and vapours at pressures near atmosphere in standard form, with alternative inlet systems being offered for applications requiring direct sampling from higher pressures to 30 bar.

The Hiden QIC quartz-lined sampling interface operating at up to 200°C provides fast response times of less than 300 milliseconds for most common gases and vapours, including water vapour.

HPR-20 DLS

HPR-20 DLS
for Ultra-High Resolution & Sensitivity Analysis of Hydrogen Isotopes and Light Gases

The HPR-20 DLS includes Hiden's DLS-20 triple filter quadrupole mass spectrometer with 20 mm pole diameter.

The DLS-20 includes unique, user-switchable resolution modes allowing the DLS-20 quadrupole mass spectrometer to operate in dual quadrupole stability regions (Zones 1 and H) offering ultra-high resolution in the mass range to 22.5 amu (zone H) and very-high resolution performance up to 200 amu (Zone 1).

HPR-20 EPIC
with Electron Impact/Electron Attachment Ionization Modes

The system includes the Hiden EPIC triple filter mass spectrometer including a high gain Pulse Ion Counting electron multiplier detector with positive and negative ion detection. Analysis is both by standard electron impact ionization and by appearance potential soft ionisation (APSI-MS).

The system includes a software selectable mode, electron attachment mass spectrometry (EA-MS), to analyse negative ions formed within the internal ioniser by electron attachment. The electron attachment mode provides vital information for investigating electronegative species, identifying the parent molecules of stable radicals from plasma processes for example.

HPR-20 S1000
with 1000 amu mass range

The standard HPR-20 S1000 system includes the Hiden triple filter quadrupole mass spectrometer with 1000 amu mass range. The dual Faraday and Pulse Ion Counting electron multiplier detectors allow a detection capability of less than 5 parts-per-billion.

FEATURES:

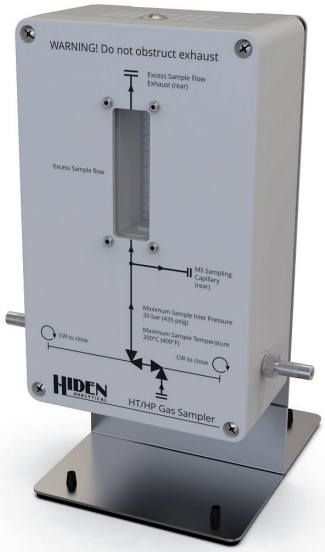
- High mass ranges
- Ultra-high resolution
- Negative ion detection with electron attachment

GAS SAMPLING INLET OPTIONS

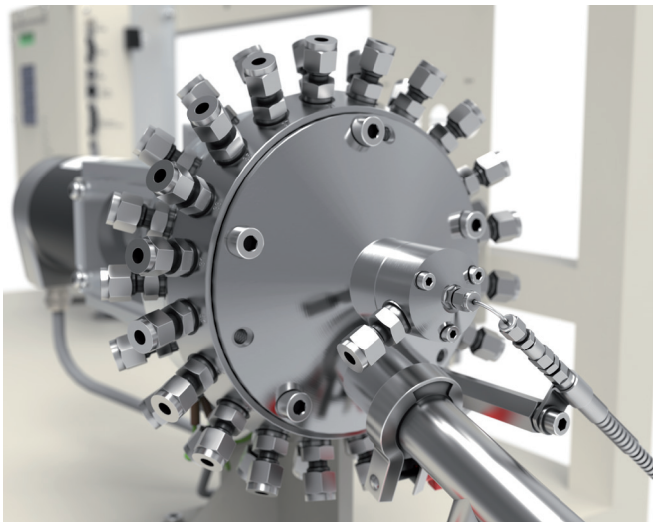
Pressure and Temperature Gas Sampling Options

Hiden offers a variety of inlet options for the gas analysis systems. Capillary inlets are available to sample at pressures both above and below atmospheric pressure. High pressure inlets are offered for sampling gases and vapours up to 30 bar, and special capillaries are offered for low pressure sampling down to 1 mbar. There is also a high temperature version of the QIC Inlet available for demanding applications.

Other options include heated capillary extensions, heated multi-stream inlets and hot-zone adaptors for sampling from furnaces (for example TGA-MS).



HT/HP Inlet (up to 30 bar at 200°C)



Proteus 20-way, 40-way and 80-way rotary valve

Twin Capillary QIC Inlet – Dual Capillary system with fast switching valve

FEATURES:

- High temperature capillary inlet
- High pressure/high temperature sampler
- Low pressure capillaries
- Micro-flow capillary inlet
- Heated capillary extension
- Hot-zone inlets
- Multi-stream selectors - 8, 16, 20, 40 and 80-way
- Flexible RGA inlet for residual gas analysis at high vacuum
- Ultra-low flow heated capillary inlet

Micro-flow Capillary Inlet. Sampling rate 12 µl/min. Single or multi-capillary inlet option

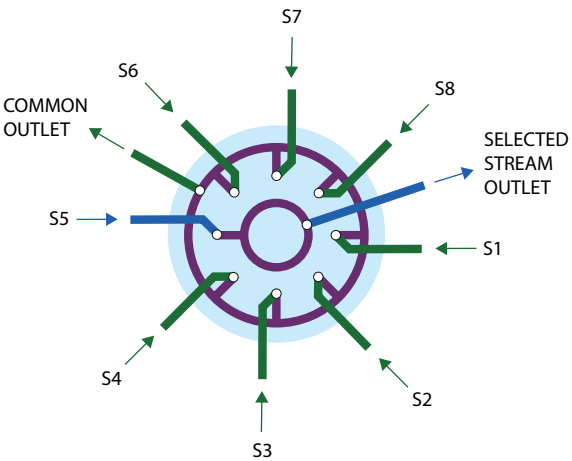
HPR-20 MULTI-STREAM SYSTEMS
Gas Analysis Systems for Multi-stream Analysis

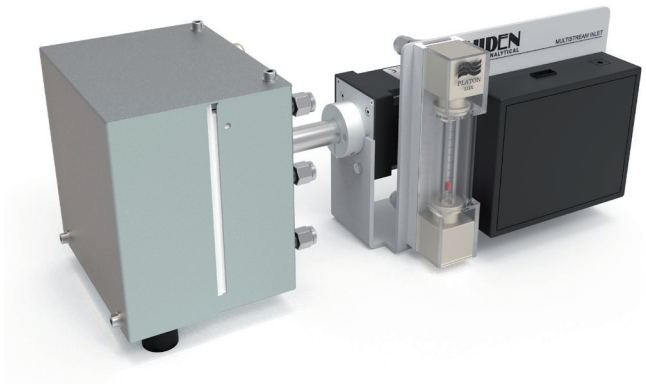
MULTI-STREAM SAMPLING CAPABILITY IS OFFERED IN TWO VERSIONS:

- **Laboratory scale multi-stream valve, MSV series for analysis of up to 16 sample lines**
- **Process analysis multi-stream Proteus valve for sampling up to 80 sample lines**

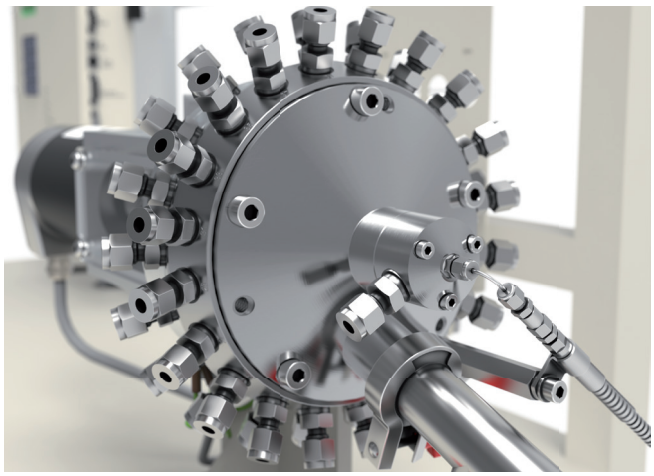
Sampling systems are configured for continuous flow for all lines as standard providing fresh sample for analysis with a minimum sample purge time. Compatible for connection with the QIC capillary inlet.

Automatic operation allows the data to be collected and displayed stream by stream. Stream switching, data acquisition and flush timing are user controllable in software.





8-way multi-stream valve



Proteus multi-stream selector

SPECIAL SYSTEM CONFIGURATIONS ARE OFFERED FOR FERMENTATION OFF-GAS ANALYSIS:

QIC BioStream systems

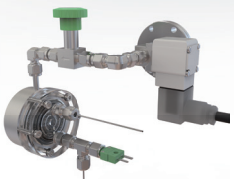
The QIC BioStream utilises the fermentation specific functionality of QGAsoft. The addition of an integrated mass flow meter allows calculation of key microbial indicators, including OUR (Oxygen Uptake Rate), CER (Carbon dioxide Evolution Rate) and RQ (Respiratory Quotient). The built in OPC server makes external control and integration with Bioreactors, simple and intuitive.

QIC MultiStream - benchtop system

QIC BioStream system - mobile cart

HPR-40 MIMS & *p*QA
for Dissolved Species Analysis

HPR-40 MIMS



FT-High Sensitivity - for improved response to atmospheric gases

FT-Standard - for continuous environmental water analysis

The Hiden HPR-40 MIMS Membrane Inlet Mass Spectrometer is a compact benchtop gas analysis system for real-time quantitative analysis and monitoring of dissolved/evolved gases.

The system offers the facility for analysis to sub-ppb (parts-per-billion) levels and is suited to gas analysis applications where sample volume is small and for environmental applications where detection of a low concentration level is required. Many different interchangeable membrane inlet probes are available to address a broad range of applications.

The inlet probe uses a gas permeable membrane that allows dissolved gas/vapour molecules to pass through it and into the ion source of a high precision quadrupole mass spectrometer.

A solenoid safety valve provides protection for the mass spectrometer and vacuum system in case of membrane failure.

MIMS Probe - for direct in-situ analysis of liquids and slurries

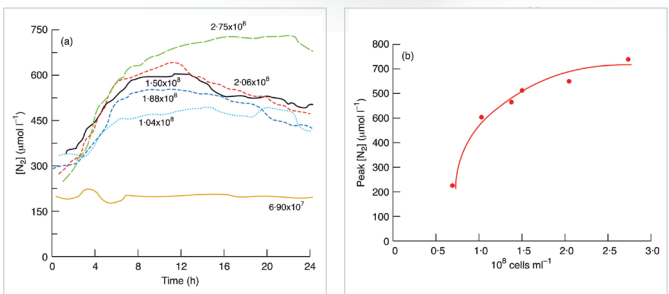
*p*QA

FEATURES:

- Analysis of dissolved species with mass range to 200 amu (300 amu option)
- Sub parts-per-billion detection levels
- High precision and stability species ratio measurements

APPLICATIONS:

- Groundwater studies
- Volatile organic compounds (VOCs) detection
- Pollution monitoring
- Denitrification studies
- Environmental research
- Oceanic trace gas measurements
- Wastewater, sludge & soil core analysis
- Enzyme activity studies



Denitrification by *Pseudomonas stutzeri* in a sterile lake water microcosm supplemented with succinate and nitrate

JR Firth and C Edwards 2000 *Journal of Applied Microbiology* **88** 853-859

HPR-20 OEMS
for Online Electrochemical Mass Spectrometry

The Hiden HPR-20 OEMS (Online Electrochemical Mass Spectrometer) is a system configured for continuous analysis of evolved gases and vapours in electrochemistry as a function of the applied potential on the real-time scale. The ultra-low flow real time sampling capillary allows for connection for head space sampling and/or connection to electrochemical cells, EL-Cell for example.

The standard system with 200 amu mass range has a detection capability to less than 100 parts-per-billion. The optional 3F series 300 amu system with triple stage mass filter offers extended detection levels to 5 parts-per-billion together with enhanced contamination resistance and is recommended for applications requiring optimum abundance sensitivity and/or analyses of corrosive or condensable species.

Ultra-Low Flow (ULF) QIC Heated Capillary Inlet

HPR-20 OEMS system

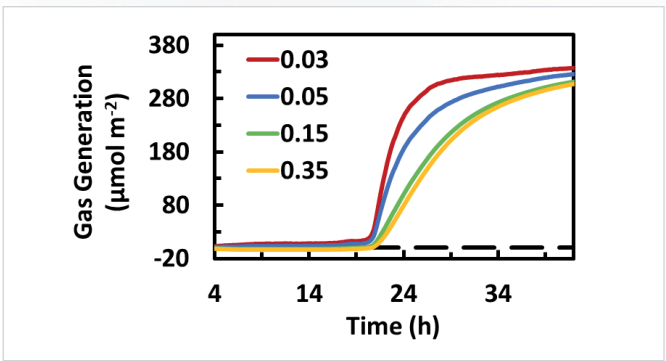


Figure 1. In-situ OEMS data plotted with gas generation from closed-cell measurements of a lithium | LNO half-cell.

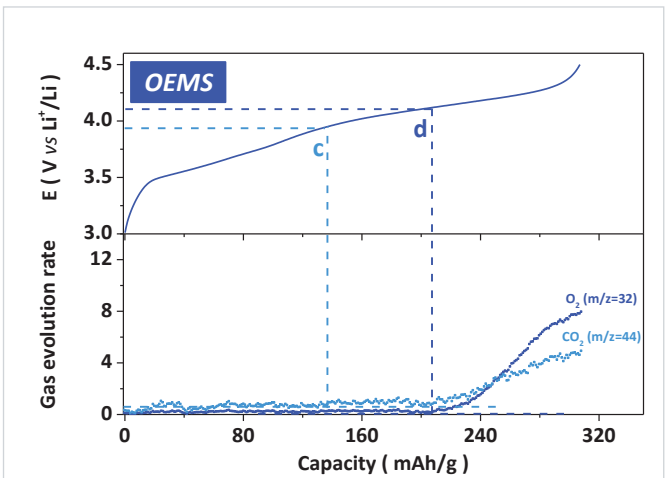


Figure 2. Potential (top panel) and gas evolution rate (bottom panel) as a function of capacity for $Li_2Ru_{0.75}Ti_{0.25}O_3$ measured by OEMS.

Reference: Journal of The Electrochemical Society (2018) 165, A3326

FEATURES:

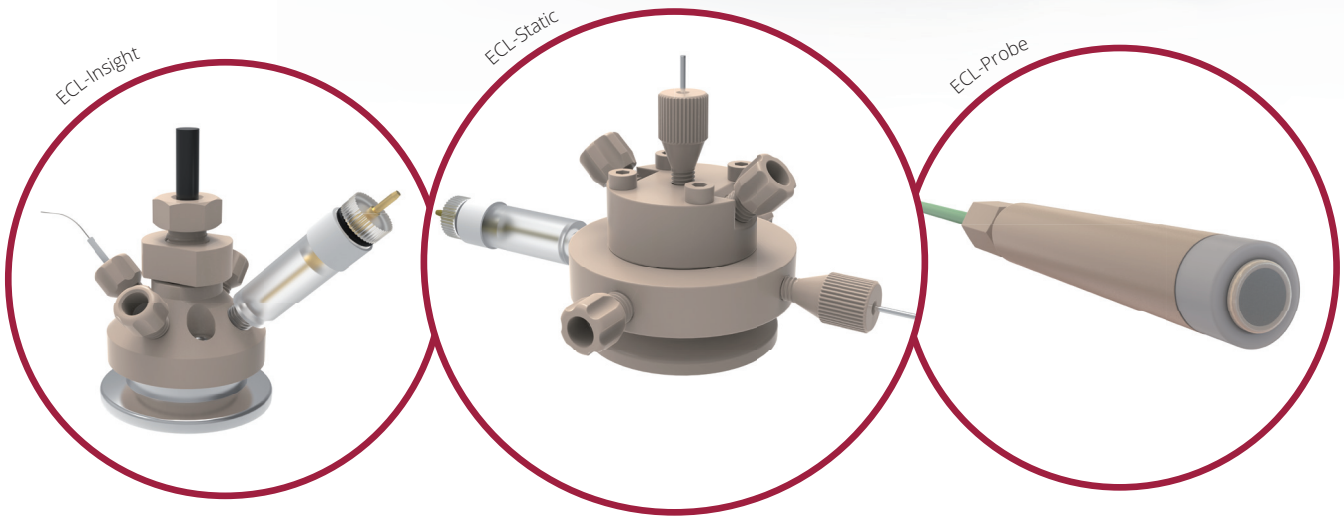
- Response time as fast as 300 ms
- Detection from 100 ppb – 100%
- Fast data acquisition: 1000 measurements per second
- Flow rate – 12 µL/min to 16mL/min
- APSI-MS soft ionisation mode
- Mass range: 200 amu is standard. 300 amu option
- Broad range of sampling accessories
- Custom interfaces for diverse OEMS applications

HPR-40 DEMS
for Differential Electrochemical Mass Spectrometry

Differential Electrochemical Mass Spectrometry is a technique that allows unique online analysis of gaseous and volatile products from electrochemical reactions. The Hiden DEMS systems combines advanced electrochemical half cells with excellent performance in mass spectrometry to achieve outstanding analytical capabilities.

Designed for applications such as fuel cell diagnostics, CO_2 reduction, catalyst evaluation, corrosion studies and battery research. It provides scientists with accurate, immediate data on reaction pathways and product selectivity.

HPR-40 DEMS system



FEATURES:

- Versatile Mass Spectrometer system compatible with multiple cells and inlet types
- Near-instantaneous time response – direct electrode-to-MS connection delivers rapid, quantitative product detection
- Mass scanning and time/intensity trend monitoring of multiple species
- Deposition compatible working electrodes
- Data synchronisation within a single intuitive software package
- A turnkey solution – everything you need to start your experiments immediately

The system integrates advanced electrochemical half-cells from the Hiden ECL Series:

ECL-Static – Research-ready cell for static or flow-based setups, offering flexibility for fuel cell, corrosion, and catalyst studies with custom electrode configurations.

ECL-Insight – High-performance, dual-chamber design with a gold-sputtered membrane for bubble-free operation and excellent sensitivity. Ideal for CO_2 reduction, hydrogen evolution, and isotope labelling experiments.

ECL-Probe – Immersion-ready probe for dissolved gas analysis in standard or custom cells, featuring a non-metallic design to prevent electrochemical interference.

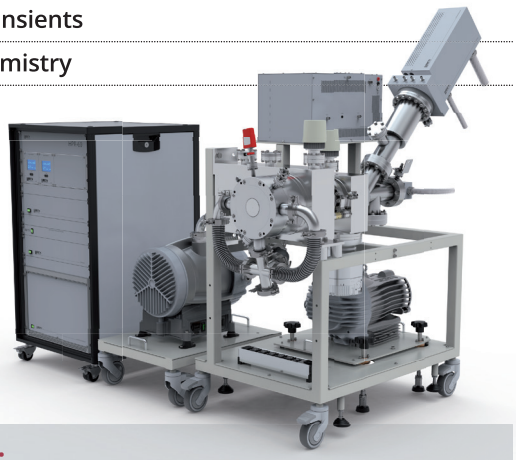
Together, these options make the HPR-40 DEMS a turnkey, modular solution for advanced electrochemical gas analysis.

HPR-60 MBMS
the Ultimate Solution for Reactive Gas & Plasma Analysis

The Hiden HPR-60 MBMS Molecular Beam Mass Spectrometer is a compact skimmer inlet MS for the analysis of reactive gas phase intermediates. Radicals are sampled via a multistage differentially pumped skimmer inlet and transferred to the MS ion source with minimal interaction with other species and without wall collisions. Customisable inlets allow connection to many different reactor systems, including atmospheric plasmas.

The skimmer system, combined with a Hiden triple filter precision mass spectrometer, offers a sampling system with ultra fast response and high accuracy.

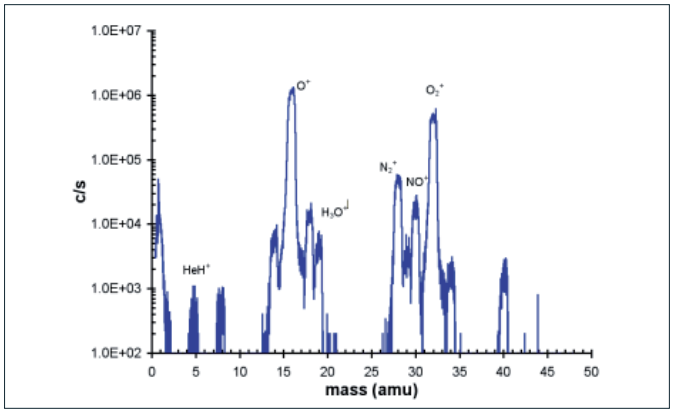
- catalytic reactors
- reaction kinetics
- study of transients
- plasma chemistry



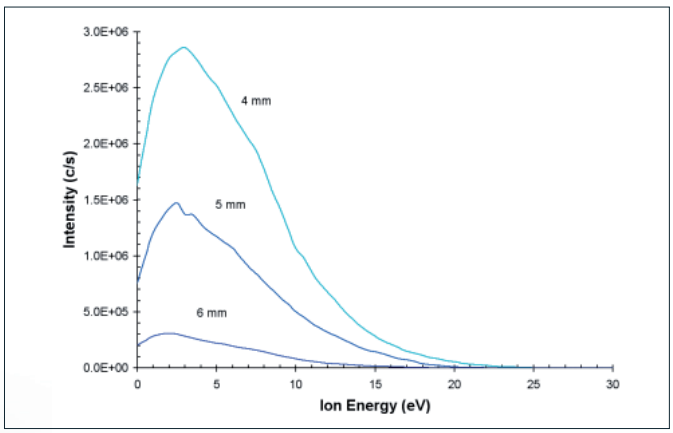
HPR-60 MBMS

FEATURES:

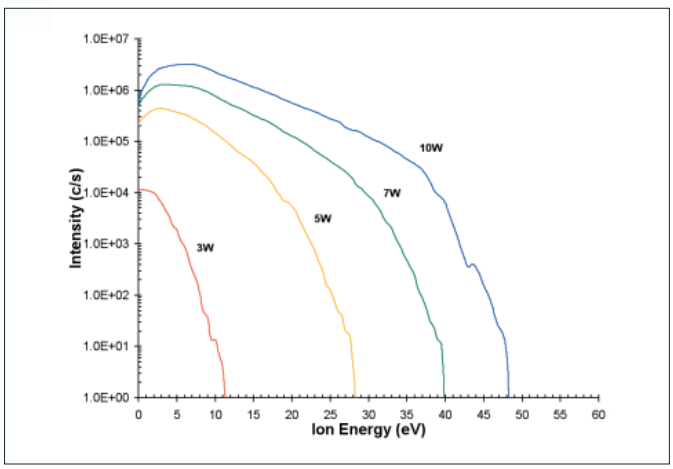
- Positive and negative ion analysis
- Appearance potential spectra for radical analysis
- Electron attachment Mass Spectrometry (EAMS) mode option for electronegative radicals analysis
- Front stage heating option up to 1000°C
- Molecular beam chopper option for automated beam foreground-background measurement
- Windows® MASsoft Professional PC software with RS232, USB, and Ethernet communication links
- Enhanced pumping for sampling to 5 bar
- Options to configure integral MS for standalone studies in vacuum chamber
- MCS detector option for 50 ns time resolved sampling
- Liquid N_2 cryopanel for parts-per-billion level studies



Positive ion mass spectrum from a typical atmospheric treatment device.



Nitrogen Ion Energy Distribution as a function of distance from an atmospheric plasma treatment device.



Oxygen ion energy as a function of plasma power from an atmospheric plasma treatment device

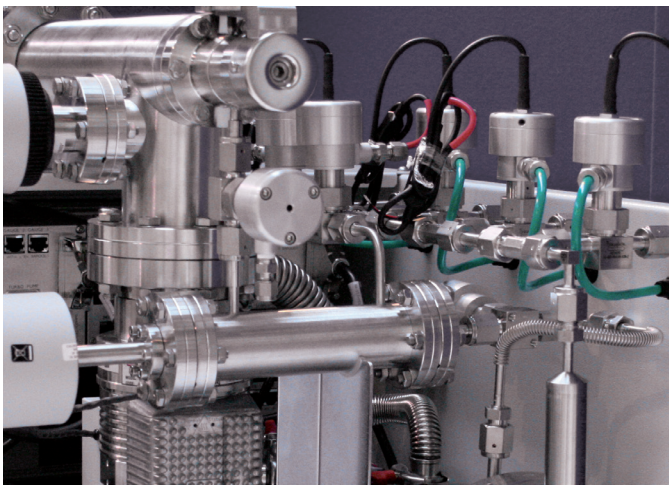
HPR-70
for Discrete Low Volume Sample Analysis

The Hiden HPR-70 compact benchtop batch inlet gas analysis system is suitable for the analysis of discrete gas samples.

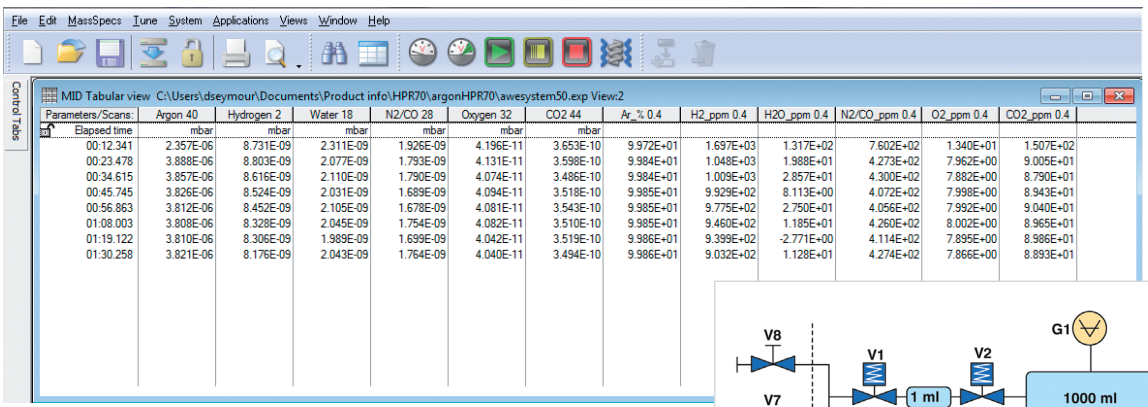
A small quantity of gas, usually at or close to atmospheric pressure, is sampled using an automated batch inlet. After expansion and consequent pressure drop the gas is analysed using a high sensitivity 500 amu quadrupole mass spectrometer.

Most minor components in the gas mixture can be measured at ppm levels.

- **landfill and environmental monitoring**
- **nuclear gas analysis**
- **head space measurements**
- **fuel cell analysis**
- **geological samples**

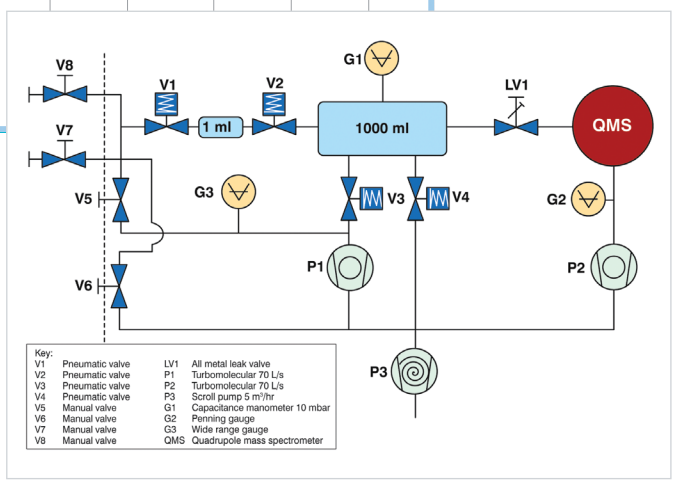


HPR-70 batch inlet



Parameters/Scans:	Argon 40	Hydrogen 2	Water 18	N2/CO 28	Oxygen 32	CO2 44	Ar_% 0.4	H2_ppm 0.4	H2O_ppm 0.4	N2/CO_ppm 0.4	O2_ppm 0.4	CO2_ppm 0.4
Elapsed time	mbar	mbar	mbar	mbar	mbar	mbar						
00:12.341	2.357E-06	8.731E-09	2.311E-09	1.926E-09	4.196E-11	3.653E-10	9.972E+01	1.697E+03	1.317E+02	7.602E+02	1.340E+01	1.507E+02
00:23.478	3.888E-06	8.803E-09	2.077E-09	1.793E-09	4.131E-11	3.598E-10	9.984E+01	1.048E+03	1.988E+01	4.273E+02	7.962E+00	9.005E+01
00:34.615	3.857E-06	8.616E-09	2.110E-09	1.790E-09	4.074E-11	3.486E-10	9.984E+01	1.009E+03	2.857E+01	4.300E+02	7.882E+00	8.790E+01
00:45.745	3.826E-06	8.524E-09	2.031E-09	1.689E-09	4.094E-11	3.518E-10	9.985E+01	9.929E+02	8.113E+00	4.072E+02	7.998E+00	8.943E+01
00:56.863	3.812E-06	8.452E-09	2.105E-09	1.678E-09	4.081E-11	3.543E-10	9.985E+01	9.775E+02	2.750E+01	4.056E+02	7.992E+00	9.040E+01
01:08.003	3.808E-06	8.328E-09	2.045E-09	1.754E-09	4.082E-11	3.510E-10	9.985E+01	9.460E+02	1.185E+01	4.260E+02	8.002E+00	8.965E+01
01:19.122	3.810E-06	8.306E-09	1.989E-09	1.699E-09	4.042E-11	3.519E-10	9.986E+01	9.399E+02	-2.771E+00	4.114E+02	7.895E+00	8.986E+01
01:30.258	3.821E-06	8.176E-09	2.043E-09	1.764E-09	4.040E-11	3.494E-10	9.986E+01	9.032E+02	1.128E+01	4.274E+02	7.866E+00	8.893E+01

HPR-70 batch inlet sampling schematic



FEATURES:

- Dual compound turbo pumps and oil-free, totally dry backing pump
- Automatic dosing, expansion and accurate sampling
- Total sample pressure measurement with capacitance manometer
- Optional aliquot filling facility
- 1 litre sample reservoir
- 1 ml injection reservoir
- Optional calibration lines

HPR-30 MULTI INLET
for Analysis of Gas and Vapour Species in Vacuum Processes

The HPR-30 Multi Inlet is designed for rapid acquisition and high-sensitivity analysis of gas and vapour species at various pressures. Equipped with Hiden's multi-level software package, the system offers both straightforward control of mass spectrometer parameters and advanced data manipulation with external device control.

Applications include leak detection, contamination monitoring, process trend analysis, and the analysis of high-mass species and precursors used in techniques like ALD, ALE and MOCVD.

The HPR-30 Multi Inlet is a versatile process gas analysis system capable of sampling in real time across a wide pressure range - from UHV to atmospheric pressure. Featuring multiple flexible inlets and an innovative 2m tri-valve sampling manifold, it enables automated switching between pressure ranges and effortless connection to ALD and R&D tools - even in confined spaces - for maximum process flexibility.

ALL-METAL LEAK VALVE OPTION – HPR-30 FOR HYDROGEN MEMBRANE ANALYSIS

The Hiden Analytical HPR-30 system can be equipped with an all-metal leak valve for precise gas sampling from UHV up to 10 bar. Fully bakeable and available in manual or automatic versions, the valve ensures clean, repeatable operation across a wide pressure range.

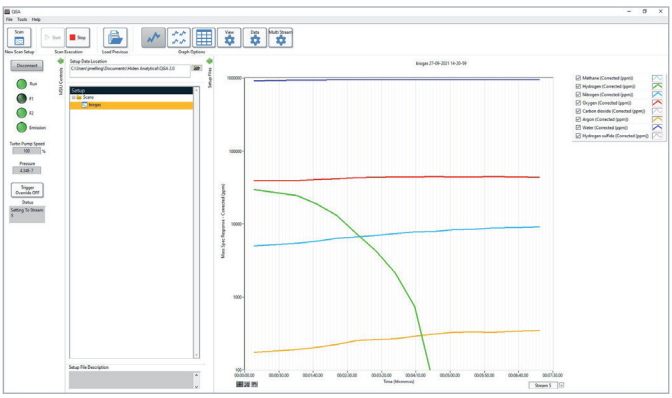
Ideal for hydrogen membrane research, this configuration enables direct analysis of gases permeating through polymeric, metallic, ceramic, or carbon membranes. Researchers can assess membrane performance parameters such as permeability, selectivity, purity, and recovery with high sensitivity.

Compact and flexible, the HPR-30 can be mounted on a benchtop or mobile cart, providing a versatile platform for hydrogen production and separation studies.

FEATURES:

- Rapid acquisition, high-sensitivity gas and vapour analysis
- Automated tri-switching sampling manifold for multiple pressure ranges (UHV to atmosphere)
- Typical pressure ranges: < 10^{-3} mbar, 10-100 mbar and 100-2000 mbar
- Flexible inlet design with (2m) tri-valve manifold connection
- Multiple termination options: CF, VCR, KF, or Swagelok™
- Compact, mobile system ideal for vapour deposition processes and vacuum R&D environments
- Controlled via Hiden's multi-level software package

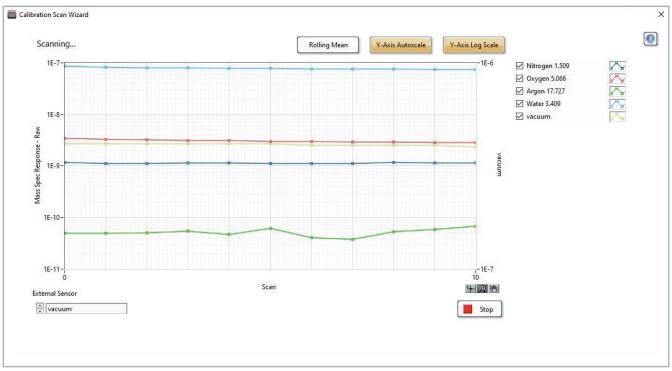
QGAsoft SOFTWARE
for Quantitative Gas and Vapour Analysis



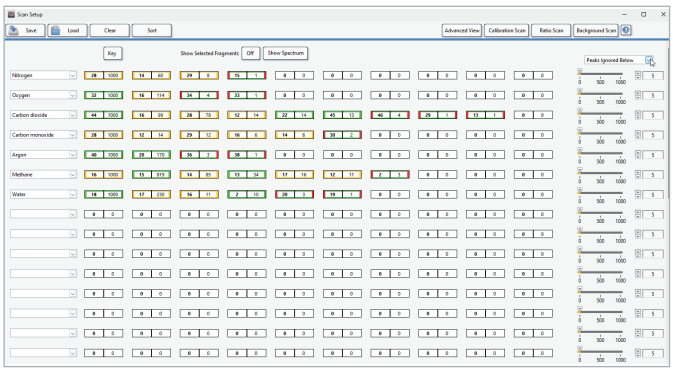
QGAsoft SOFTWARE home screen

QGAsoft is a software package for quantitative gas and vapour analysis providing real-time continuous analysis of up to 32 species with species concentration measured in the range 0.1 ppm to 100%. The software can be used in either single stream or multistream mode with gas selection valves up to 80 streams.

The software features easy-to-use calibration routines for both cracking pattern and Relative Sensitivity (RS) measurement. Analysis is performed using simple template setup routines and features automatic spectral removal algorithms and correction factor determination to output quantitative data. Integrated inputs from external devices such as CO-analyser make the software versatile for a whole range of gas analysis applications.



QGAsoft SOFTWARE calibration



QGAsoft SOFTWARE automatic mass spectral analysis setup

FEATURES:

- Quantitative analysis of up to 32 gases
- Automatic peak selection using built-in library
- Simple calibration with background correction
- Automatic subtraction of spectral overlaps
- 10 peak spectral library and simple fragment ratio update tool
- Automatic triggering of analysis from an external input
- X-axis can display time or an external input, e.g. Current, Potential
- External output via OPC or Analogue outputs
- Output data as percentage or ppm values

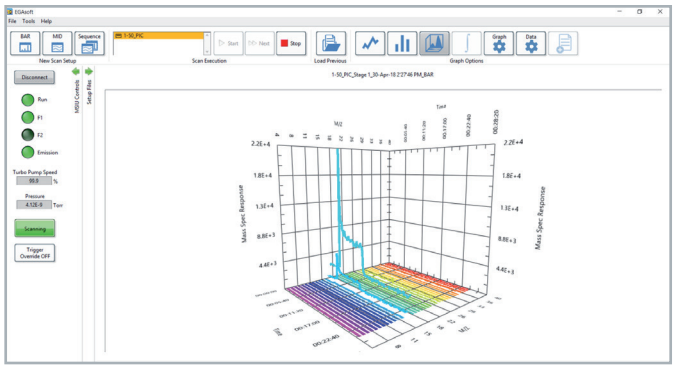
EGAsoft SOFTWARE
for Evolved Gas Analysis

Hiden EGAsoft for evolved gas analysis data acquisition and analysis. Designed to simplify evolved gas analysis from devices such as thermogravimetric analysers (TGA), the software minimises the number of settings that are required, making it easy to use even for novice users. The 3D graphing of bar scan data ensures that trends can be easily identified from the decomposition of unknown substances while the Multiple Ion Detection (MID) mode allows desorption trends over time/ temperature to be displayed.

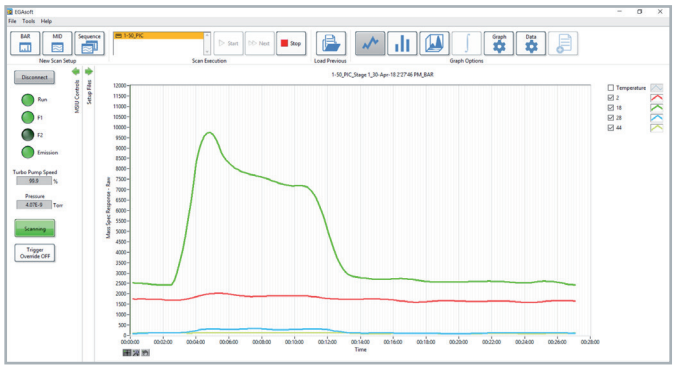
Hiden collaborates with a range of TGA manufacturers to ensure the compatibility of the file export functions with their software. Unknowns can also be identified using the NIST export function.

In addition to the acquisition features the software also allows some post process analysis functions such as peak integration and peak deconvolution with multiple Gaussian curve fitting. Data smoothing and anomalous data point removal features are also available.

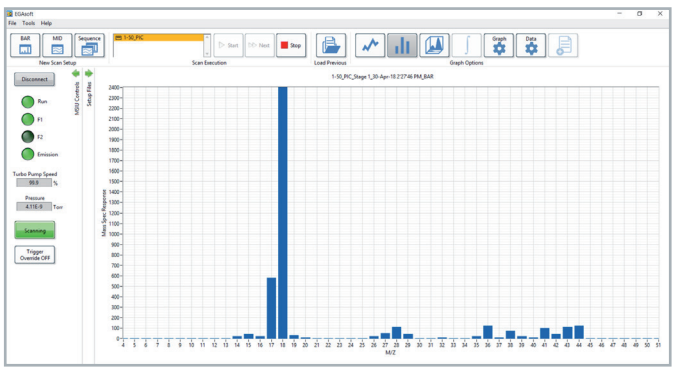
- **TGA-MS**
- **Temperature Programmed Desorption (TPD)**
- **Thermal Decomposition**



EGAsoft 3D bar mode



EGAsoft MID view



EGAsoft 2D bar mode

FEATURES:

- 3D bar scan view for easy determination of trends in bar data
- Simple automatic export in formats specific for import to any TGA/STA manufacturer's software
- Automatic spectral deconvolution in MID mode
- Peak integration and data analysis routines
- Auto-sequencing of MS data acquisition files e.g. for use with auto samplers
- Auto start/stop and temperature inputs where output signals are available
- Mass spectrometer ionisation energy control for soft ionisation of complex mixtures

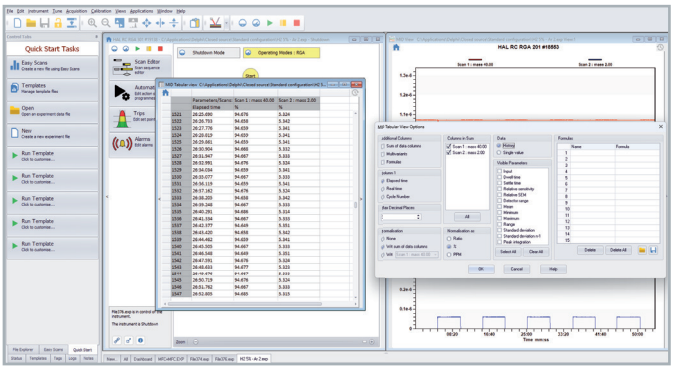
MASsoft PROFESSIONAL
Control Software

All Hiden instruments are supplied with MASsoft Professional mass spectrometer control software. MASsoft Professional is a multilevel software package allowing both simple control of mass spectrometer parameters and complex manipulation of data and control of external devices.

Quick start tabs with user configurable single key start functions means novice users can start collecting data within seconds.

Scan templates allow fast set up of scans from previous similar experiments.

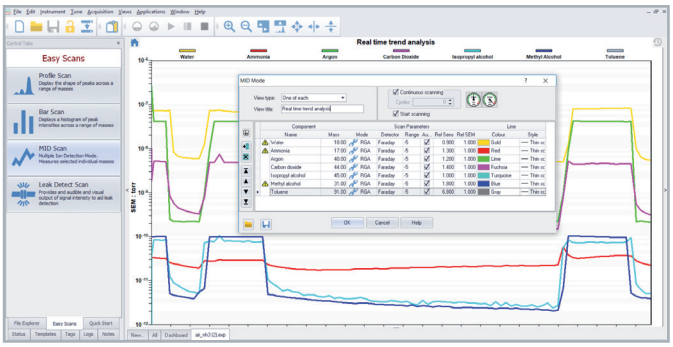
User selected alarm facilities (including status indication with message send and output drive capability) provide powerful control for process environments.



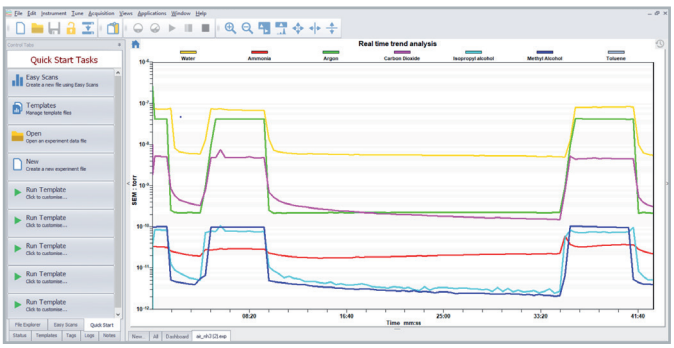
MASsoft PROFESSIONAL real time data normalisation

FEATURES:

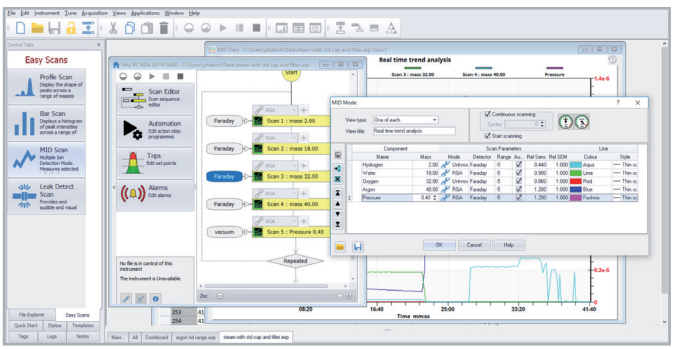
- Mass spectrometer ionisation energy control for soft ionisation of complex mixtures
- Export data to NIST MS database for analysis of unknowns
- Export to external data analysis software, e.g. Excel, Origin
- Control of external devices, e.g. MFCs, gas switching/ sampling valves and furnace PID controllers
- Output data as percentage or ppm files
- Real-time subtraction of overlapping peaks



MASsoft PROFESSIONAL trend analysis (MID) setup



MASsoft PROFESSIONAL scan gallery



MASsoft PROFESSIONAL overview

HidenAPPLICATIONS

Hiden's quadrupole mass spectrometer systems address a broad application range in:

GAS ANALYSIS

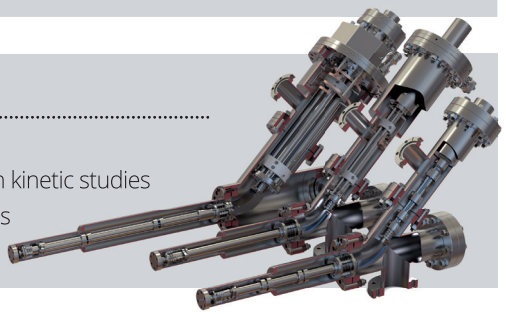
- Dynamic measurement of reaction gas streams
- Catalysis and thermal analysis
- Electrochemical analysis
- Dissolved gas analysis
- Fermentation, environmental and ecological studies

SURFACE ANALYSIS

- UHV TPD/TDS
- ToF qSIMS and SIMS analysers
- End point detection in ion beam etch
- Elemental imaging – 3D mapping
- SIMS system with simultaneous dual polarity analysis

PLASMA DIAGNOSTICS

- Plasma source characterisation
- Etch and deposition process reaction kinetic studies
- Analysis of neutral and radical species



VACUUM ANALYSIS

- Partial pressure measurement and control of process gases
- Reactive sputter process control
- Vacuum diagnostics
- Vacuum coating process monitoring

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