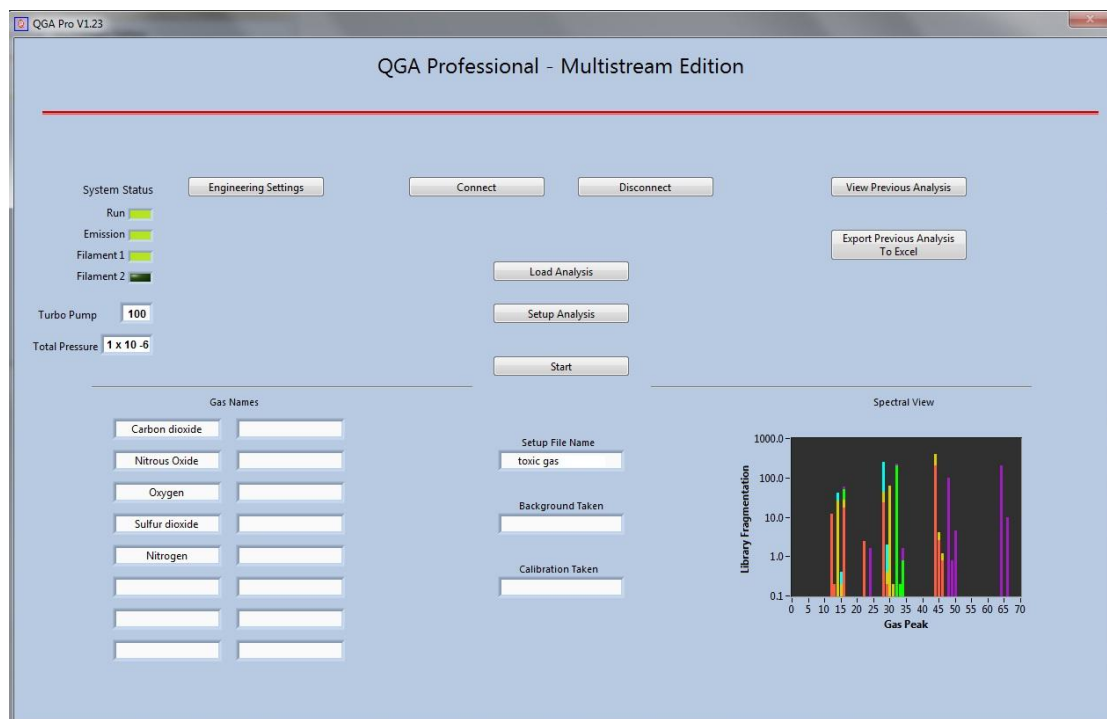


QGA Professional edition software

Quantitative gas analysis software

QGA Professional edition software is an application specific software package for quantitative gas and vapour analysis providing real time continuous analysis of up to 16 species with species concentration measured in the range 0.1PPM to 100%.



Key Features:

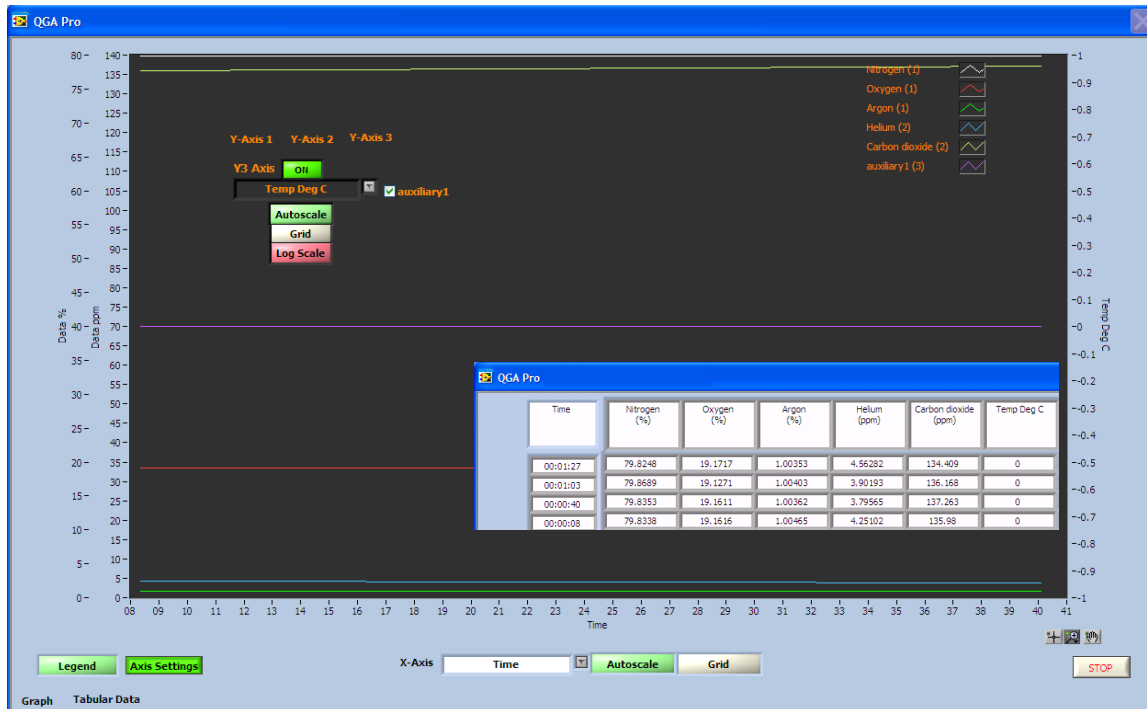
- Quantitative gas analysis of up to 16 gases.
- 10 peak spectral library with intelligent library scan feature.
- Flexible major and minor component gas calibration with background correction.
- Automatic triggering of the start of analysis from an external input
- Data view with three y axes for simultaneous 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.

Manufactured in England by:

HIDEN ANALYTICAL LTD
420 Europa Boulevard, Warrington, WA5 7UN, England
t: +44 (0) 1925 445225 f: +44 (0) 1925 416518
e: info@hiden.co.uk w: www.HidenAnalytical.com

QGA Pro.

Quantitative gas analysis

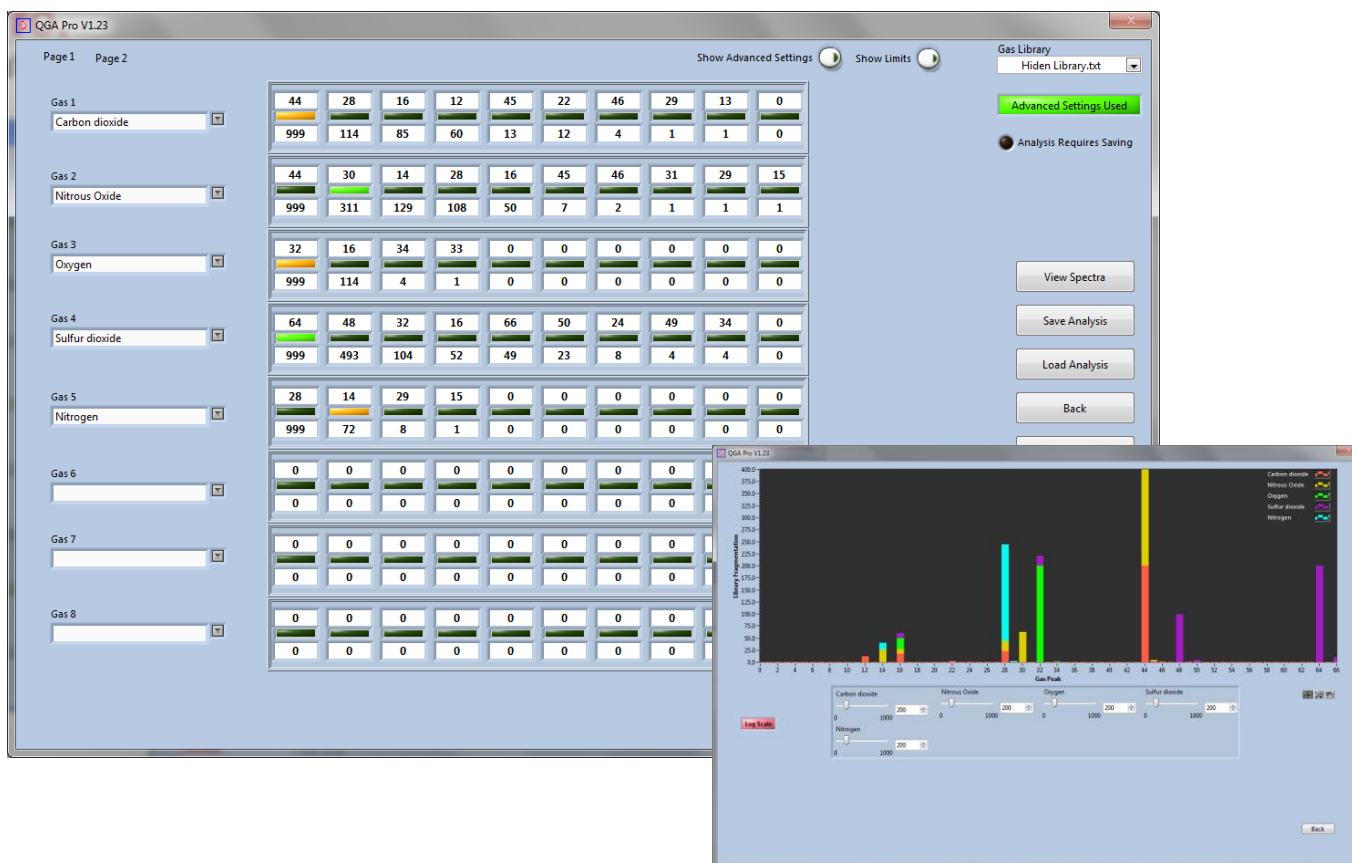


Real time analysis

- QGA: Quantitative gas analysis with graphical trend analysis.
- Multiple Y axes for real time display of quantitative data, major (%) and minor components (PPM), and external input data, temperature for example.
- X-axis – selectable/switchable display between time and external input, temperature for example.
- Comprehensive display axis control.
- Y- axis and X- axis data zoom during data acquisition and post analysis.
- Multi-plot view for multistream systems. Graphical trend analysis for up to 4 selected streams, can be displayed simultaneously.

QGA Pro.

Quantitative gas analysis set up.



Each template file is set up using the mass spectral library calculator.

Set up display has two pages available to provide analysis for up to 16 species.

The calculator shows the principle peaks for each species by mass number and intensity.

The intensity is normalized to 1000 as used by the NIST library.

The mass spectral library calculator automatically subtracts resolvable overlaps indicated by an orange indicator.

Green indicates a unique peak is available for the species analysis, and red indicates peaks that will not be used.

The spectral view shows the spectral lines for the complete analysis, and graphically illustrates the contributions from spectral overlap. The relative concentrations of the species selected can be adjusted, the spectral view dynamically changes and illustrates how the spectral lines and spectral overlaps are more or less significant for the range of concentrations evaluated.

'Advanced settings' and 'Peak limits' allow the expert user to adjust mass spectrometer settings and limits for which peaks within the library become significant, optimising the analysis set up.

QGA Pro.

Quantitative gas analysis set up – advanced settings

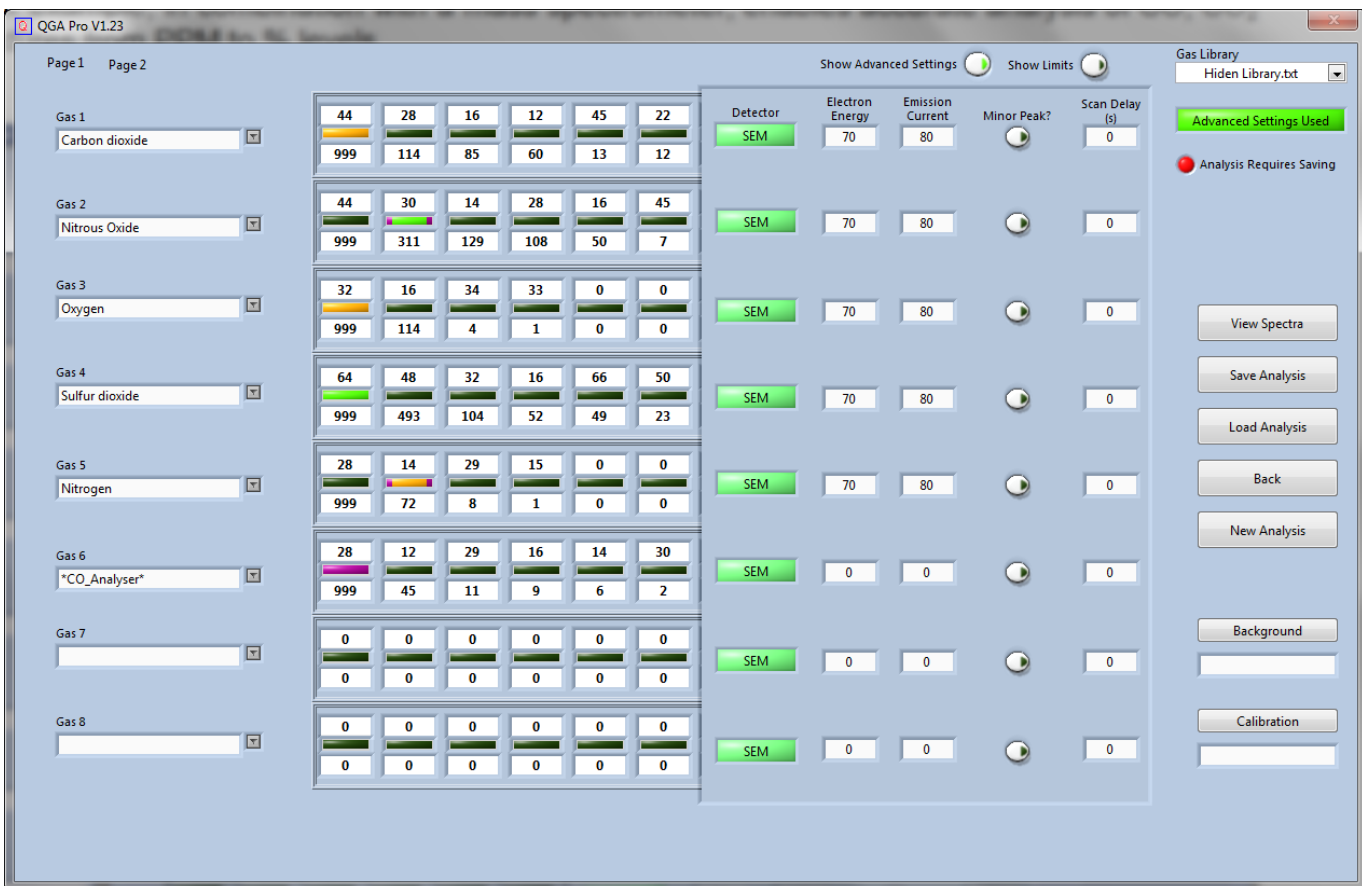
The advanced settings are available to optimise the analysis for complex mixtures, where soft ionisation techniques may be used for example.

The detector type, the electron energy and emission are selectable for each species.

Selected species may be designated as a 'minor peak'. Minor peaks are quantified and displayed on their own Y- axis in PPM units, and are calculated as a calibration and background corrected ratio of 'Gas 1'.

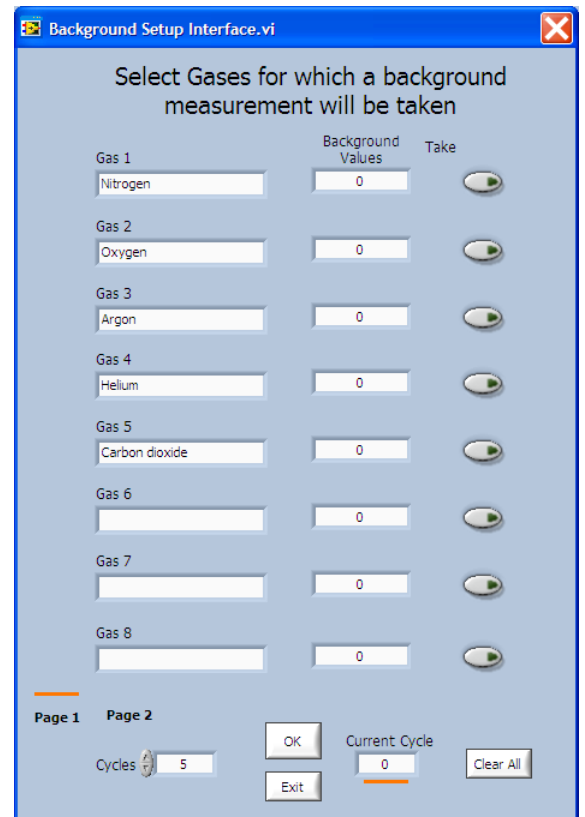
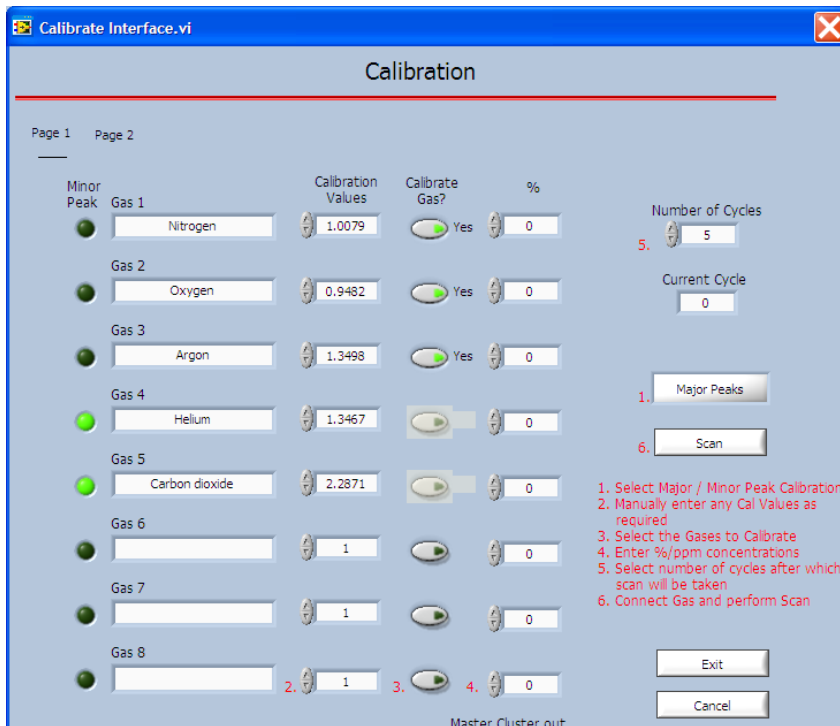
Species that are not selected as 'minor' are 'major' by default, quantified and displayed in % units and are calculated as a calibration and background corrected normalised sum

QGA Pro. software includes the capability to integrate data from an external analyser. Using a CO analyser for example, in combination with a mass spectrometer, enables accurate analysis of CO, CO₂ and N₂ mixtures from PPM to % levels.



QGA Pro.

Quantitative gas analysis – automatic calibration



The automatic calibration screen provides the user with editing capability for:

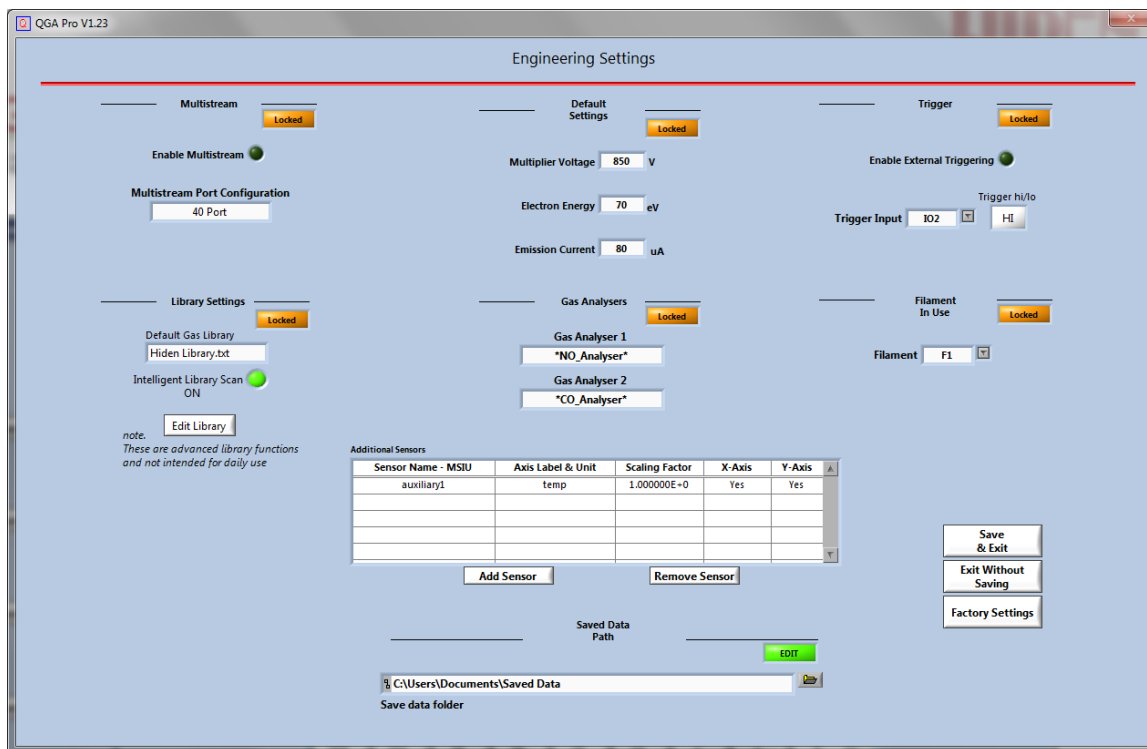
- Complete control of the calibration.
- Flexibility for the user to calibrate the instrument either from a single gas bottle, or from multiple calibration gas bottles.
- Major and minor components are calibrated separately.

For some species, water vapour for example, there will be an instrument background.

QGA Pro software includes automatic background subtraction. The background data is acquired for user selected components.

QGA Pro.

Quantitative gas analysis set up – engineering settings

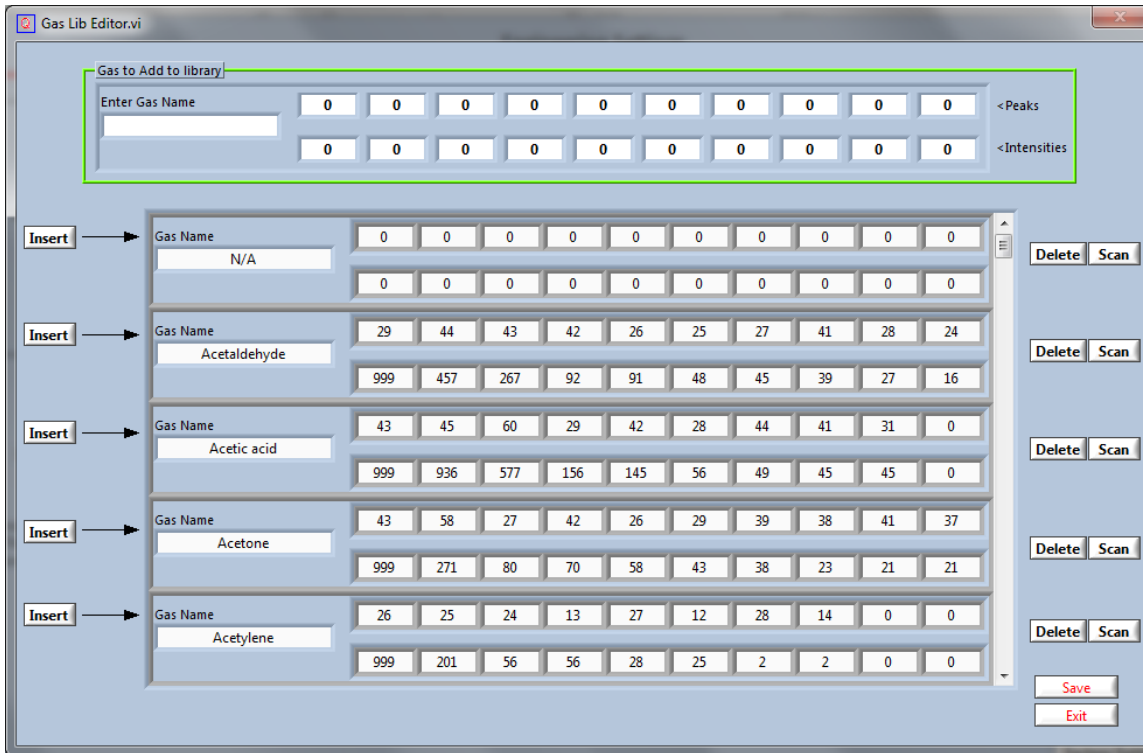


The 'Engineering Settings' control screen provides the user with editing capability for:

- Multi-stream configuration – up to 80 streams.
- Default analyser settings control.
- External trigger control to enable automatic start and stop of data acquisition from an external TTL signal, in TGA-MS for example.
- External gas analyser data integration set up.
- Filament control.
- Access to the library editor and intelligent library scan editor.

QGA Pro.

Quantitative gas analysis set up – Library editor



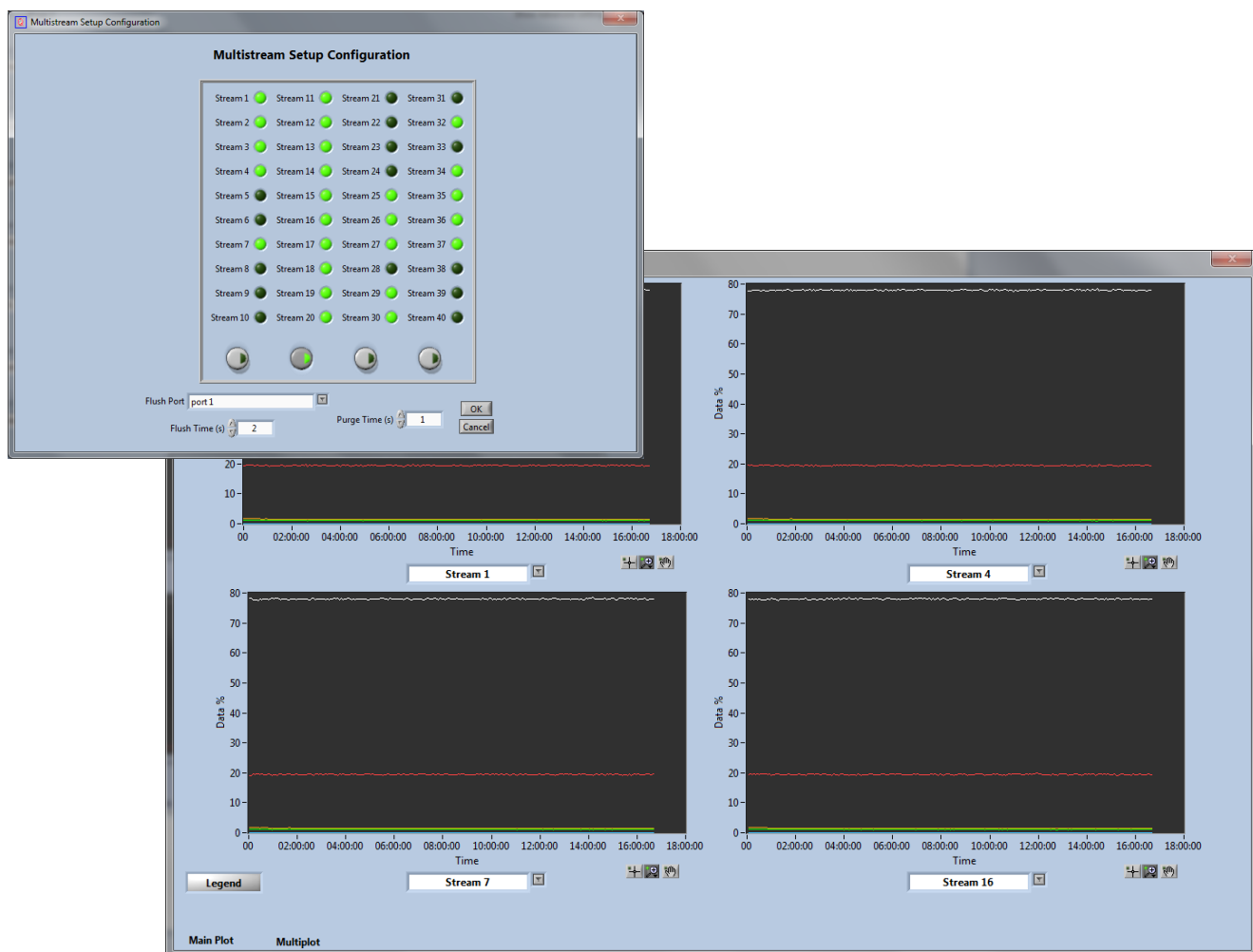
The ‘Library editor’ includes comprehensive editing facilities and the ‘intelligent library scan’ feature.

The intelligent library scan feature enables the user to analyse known gas species, calibration gases for example, and automatically adds the measured fragmentation data to the library.

Using the intelligent library scan ensures that the spectral fragmentation data used in the QGA algorithms are corrected and accurate for the specific instrument.

QGA Pro.

Multiple sample stream analysis.



Multi stream sampling enables a single mass spectrometer to analyse samples from up to 80 streams in a continuous loop sequence.

The example shown is for QGA Pro. software configured to sample from 40 streams.

The user interface provides for selection of the streams to include in the analysis and to set the purge time that the system will use between streams.

A flush port can be assigned to allow the gas switching manifold to be flushed with an inert dry gas, or connected to a vacuum line to flush the gas stream switching manifold between selected sample streams.

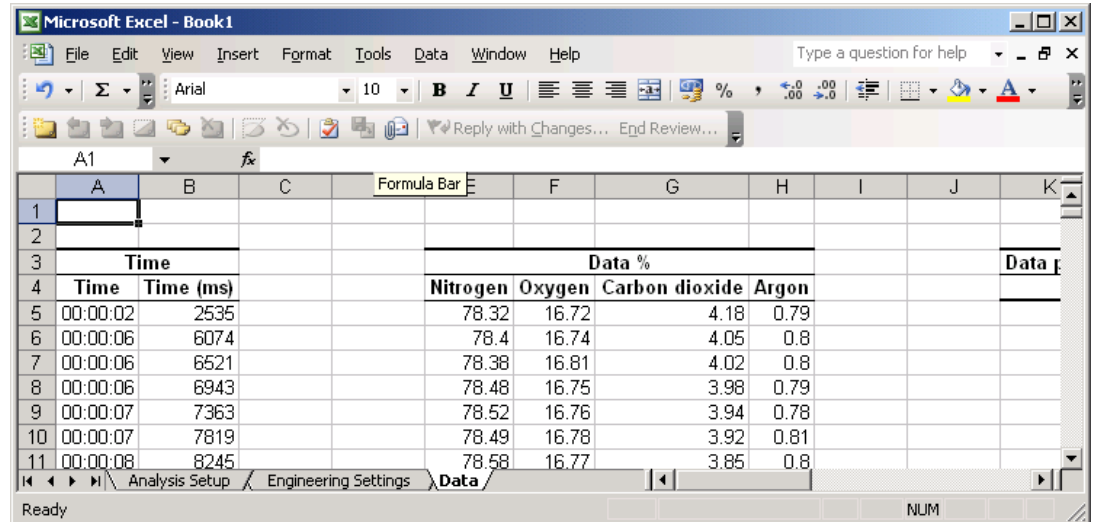
Multi-plot data view - shows the graphical trend analysis for up to 4 selected streams.

QGA Pro.

Quantitative gas analysis data export

Data Export

- Data export to MS Excel.
- On selection of a file to export, a new Excel workbook is automatically created.
- Quantitative data, raw data values and corrected data values are exported.
- Calibration factors and background correction values are recorded.
- The engineering settings are exported.
- For instruments with multistream sampling, a worksheet containing the data for each gas stream is created.



Time		Data %			
Time	Time (ms)	Nitrogen	Oxygen	Carbon dioxide	Argon
00:00:02	2535	78.32	16.72	4.18	0.79
00:00:06	6074	78.4	16.74	4.05	0.8
00:00:06	6521	78.38	16.81	4.02	0.8
00:00:06	6943	78.48	16.75	3.98	0.79
00:00:07	7363	78.52	16.76	3.94	0.78
00:00:07	7819	78.49	16.78	3.92	0.81
00:00:08	8245	78.58	16.77	3.85	0.8

QGA Pro.– file structure

QGA Pro. is a NI LabView application.
The application is Win XP / Win 7 compatible.

The instrument set-up files, including the selected gas and vapour species, calibration factors, background values and engineering settings are saved as template files for multiple use.

Each data file saved includes a copy of the instrument settings that were used for the acquisition.

QGA Professional edition software provides for quantitative gas analysis in single stream or multi stream gas analysis applications with a simple user interface and with advanced features providing data for real time trend analysis and for post processing
