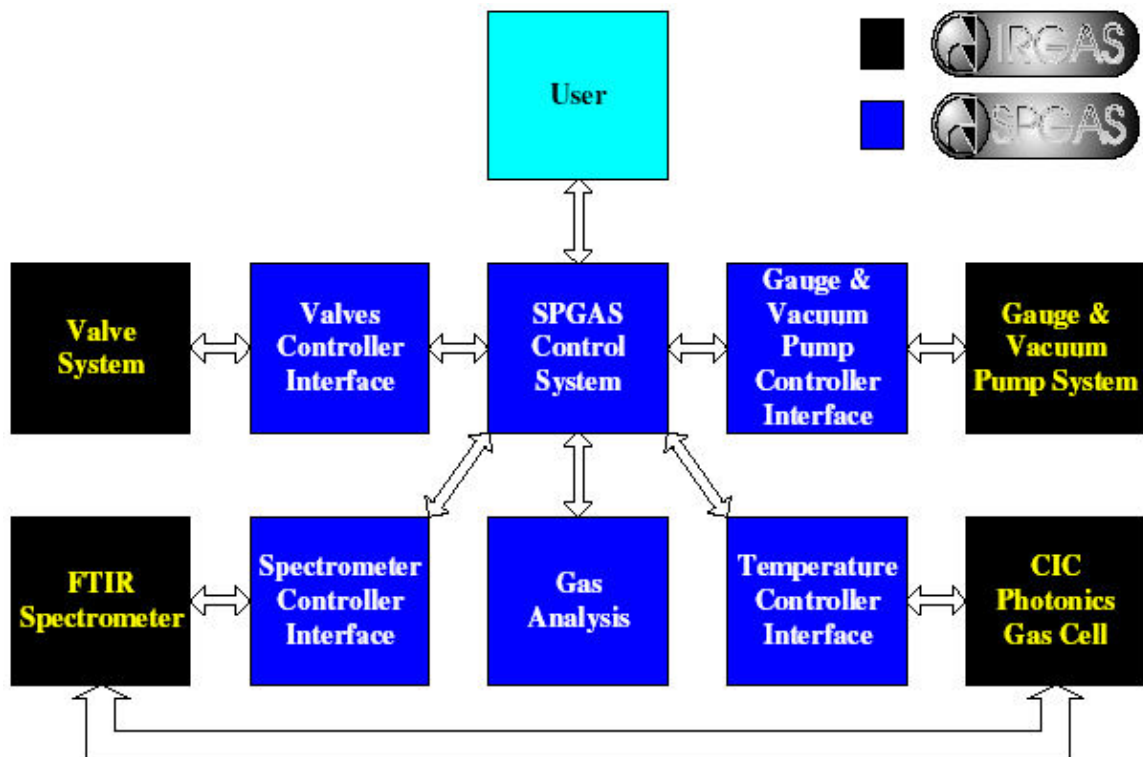




Specialty Gas Analysis Control Software System

Objectives

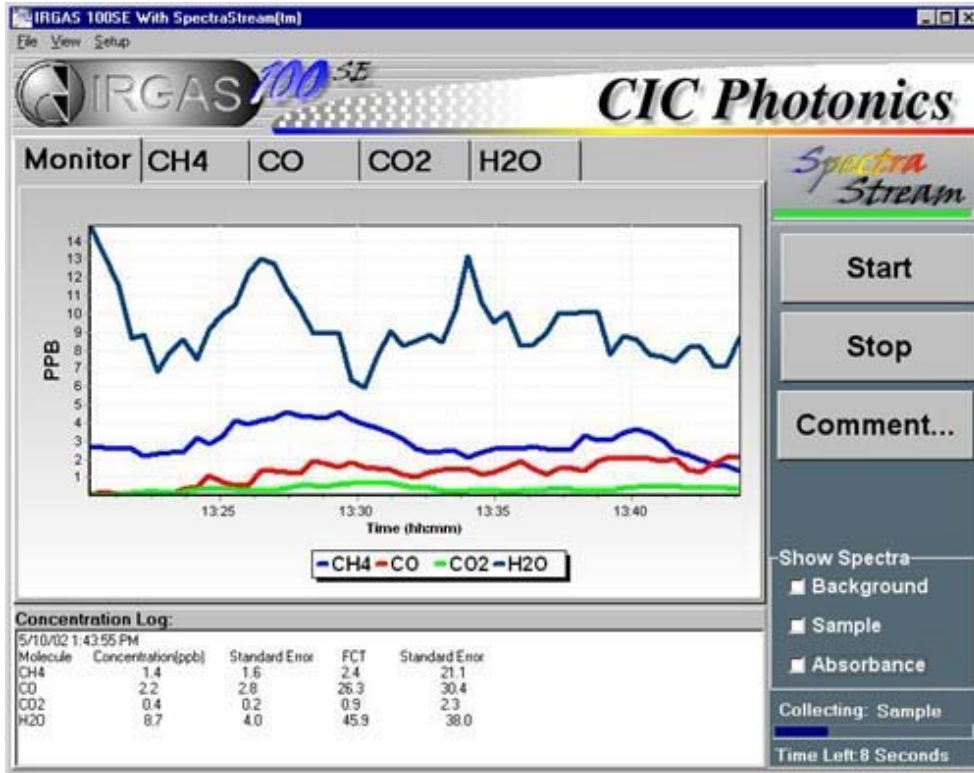
- To provide for a Turnkey Industrial Integrated Real-Time Gas Analysis System
- To be client tailorable
- To offer a modular design
- To be hardware independent
- To utilize state of the art analysis tools



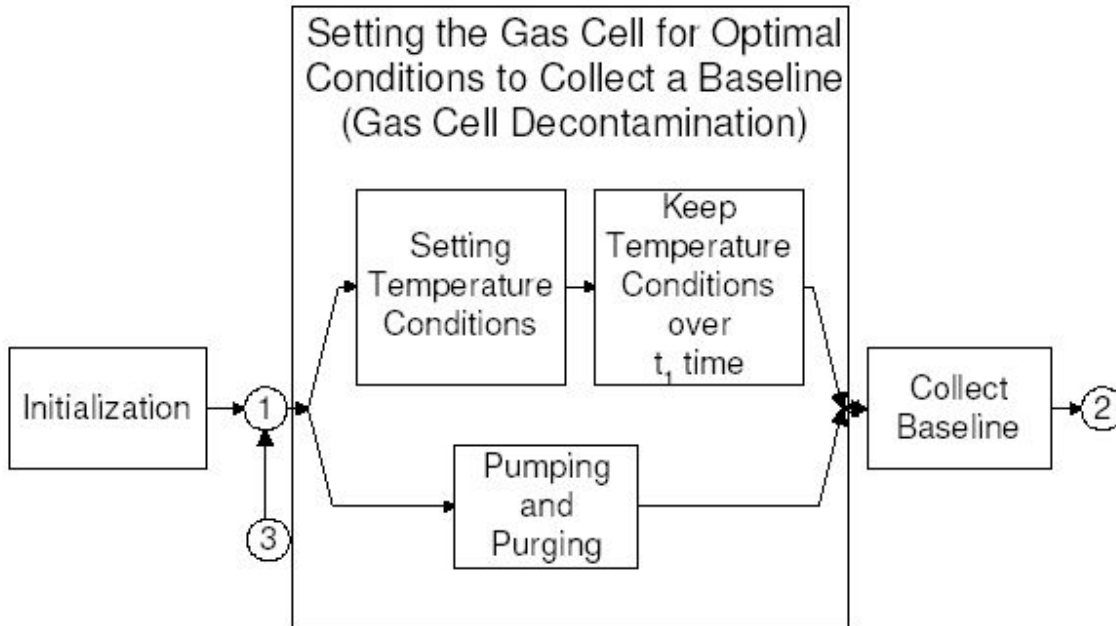
New/Unique Features of SPGAS

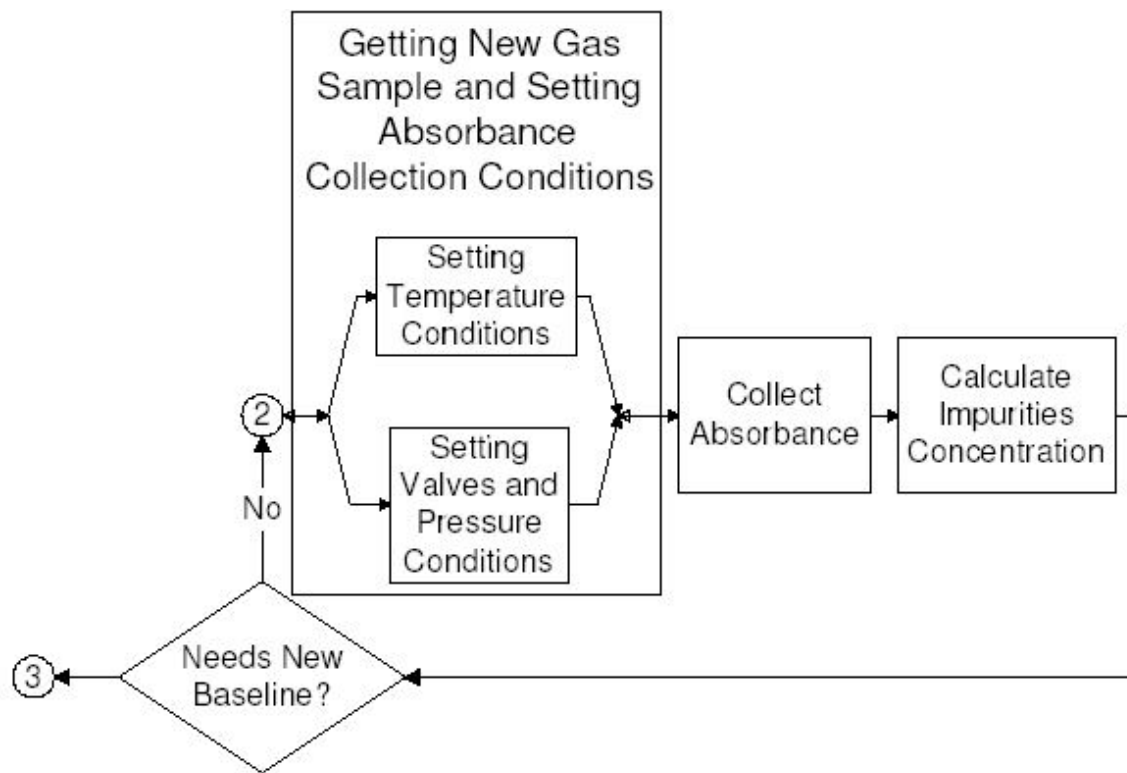
- Gas calibration based upon fundamental HITRAN data
- Weighted Multi-window CLS data analysis
- Infinite calibration data sets available
- 32 bits Architecture base on industrial standard Operating System (Win NT) Hardware Operation (1/2)

Typical SPGAS Screen Image

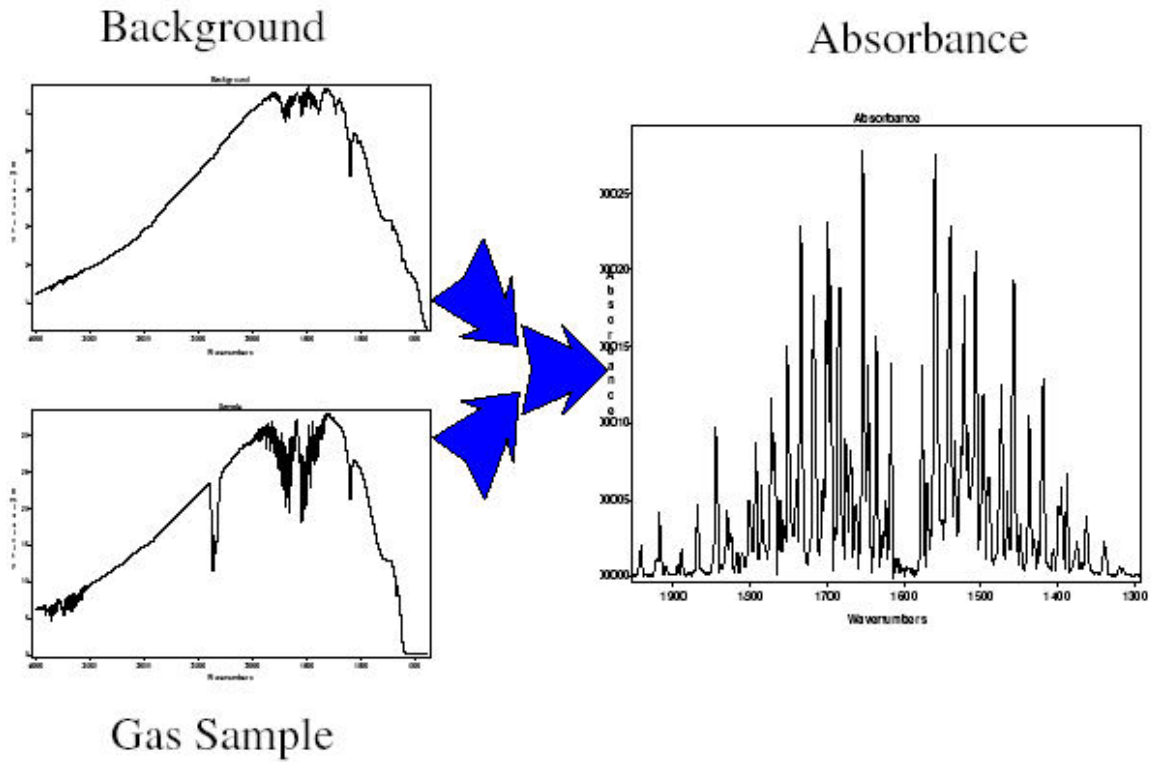


Hardware Operation

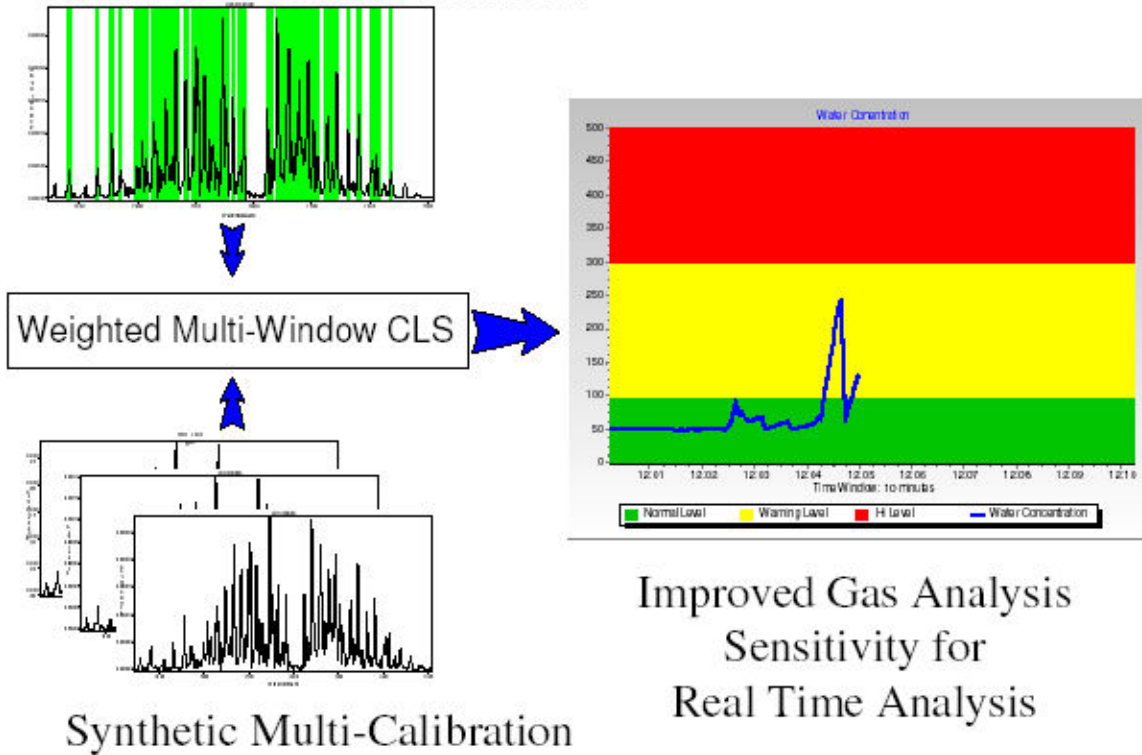




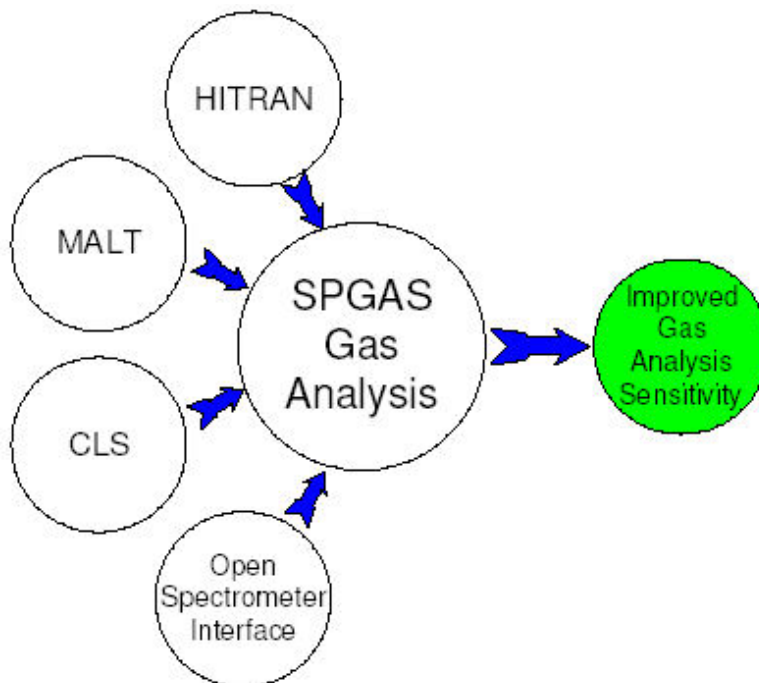
Gas Analysis



Multi-Absorbance Windows



Gas Analysis Modules



MALT

- Calculates spectra for single homogeneous path or for multiple layers
- Includes instrumental parameters into the calculations so the calculated spectra match the line shape, resolution and wavelength shift of the measure spectra.
- Uses HITRAN molecular spectroscopy databases

HITRAN/MALT vs. Actual Calibration

- Advantages
 - Calibration data free of noise
 - Best match to the measured spectrum according to the least-squares criteria
 - Operational costs reduction
 - Non time consuming calibrations
 - Precision at least as good as that of traditional methods (£ 3%)¹
- Disadvantages
 - Provide analysis only over gases included in the HITRAN database
 - System requires regeneration of calibration data if spectrometer or gas cell change

Gas Impurities

Corrosive Gases	Ammonia	Inert Gases
•H ₂ O	•H ₂ O	•H ₂ O
•CO	•CO	•CO
•CO ₂	•CO ₂	•CO ₂
•CH ₄	•CH ₄	•CH ₄
•N ₂	•N ₂	•N ₂
•O ₂	•O ₂	•O ₂
•Ar		