AC Hi-Speed Refinery Gas Analyzer Separates C1 through nC6, C6+ Hydrocarbons and Inert Gases in only 5 Minutes

Product Brief

KEY FEATURES

✔ **Hi-Speed analysis in 5 minutes**

✔ **Applies to broad sample scope**

✔ **All flows and pressures fully EPC controlled**

✔ **Includes automated sampl shut-off valve**

✔ **Robust system uses inert tubing resistant to corrosive materials**

✔ **AC GAS$^{XLNC™}$ software automates gas properties calculations**

✔ **Optional Gas and Liquid Sampling Device**

✔ **Excellent Detectability**

INTRODUCTION

Refinery gas streams vary considerably in composition. Determining individual components of each gas stream is a challenge. An exact measure of stream components is essential in achieving optimum control and assuring product quality.

HIGH SPEED ANALYSIS IN 5 MINUTES

AC Analytical Controls offers the Hi-Speed Refinery Gas Analyzer, a high speed solution that determines and reports the composition of refinery gas streams in only five minutes.

AC Hi-Speed Refinery Gas Analyzer

The AC Hi-Speed RGA system characterizes:

- C1 - nC6, C6+ hydrocarbons
- Inert gases: including nitrogen, hydrogen, helium, oxygen, carbon monoxide, carbon dioxide
- Hydrogen sulfide, which requires an additional analysis time of two minutes
- Benzene and Toluene, using the RGA extended method with a total analysis time of eleven minutes

The AC Hi-Speed RGA characterizes the composition of LPG and butane streams in only three minutes.
Optionally, the system can also be configured for hydrocarbon trace analysis.

Gaseous Samples	Liquefied Samples
• Atmospheric overhead	• LPG
• Ethylene	• Propane
• FCC Overhead	• Butane
• Fuel Gas	• Butadiene
• Recycle Gas	• Propylene
• Desulfurizer Off Gas	

AC Hi-Speed RGA offers a broad sample scope

The AC Hi-Speed analyzer meets the requirements of UOP 539, DIN 51666 and ASTM D 2163.

ANALYTICAL CONTROLS

PAC Company
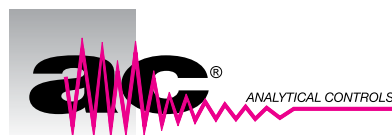
ROBUST SYSTEM

The AC Hi-Speed Refinery Gas Analyzer uses the new Agilent Technologies 7890 Series Gas Chromatograph with electronic pneumatics control (EPC).

AC configures the GC with application specific valves & columns, two Thermal Conductivity Detectors (TCD) and a Flame Ionization Detector (FID).

All flows and pressures are electronically controlled. The use of inert material increases the resistance to corrosive materials.

## HI-SPEED REFINERY GAS ANALYSIS

The Hi-Speed RGA system contains six columns and is subdivided into three separate analytical channels.

One channel determines helium and hydrogen, the second channel is used to determine oxygen, nitrogen, carbon monoxide and carbon dioxide.
The third channel separates the hydrocarbons on the PLOT column using the FID for detection.

Optionally, the Hi-Speed RGA can be configured with a liquid sampling valve to dedicate the analysis to liquefied samples.

COST-EFFECTIVE DESIGN

The AC Analyzer design allow refiners to combine three subsystems in one analyzer, which reduces the amount of investment required for refinery gas analysis.
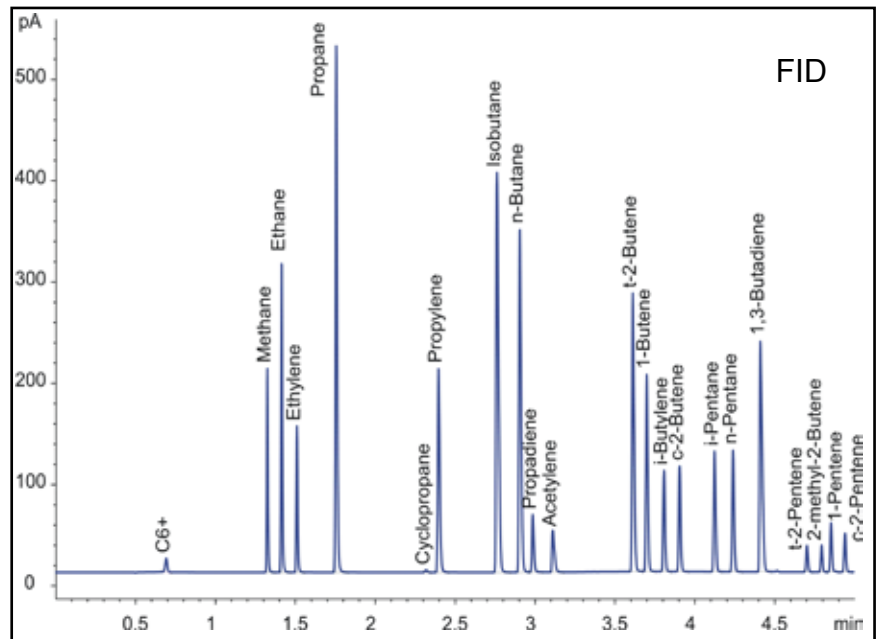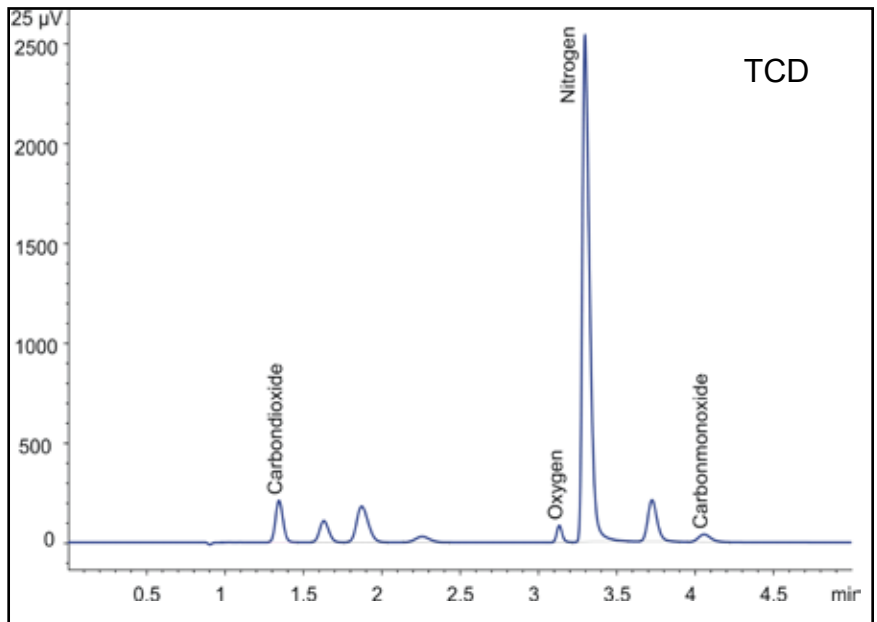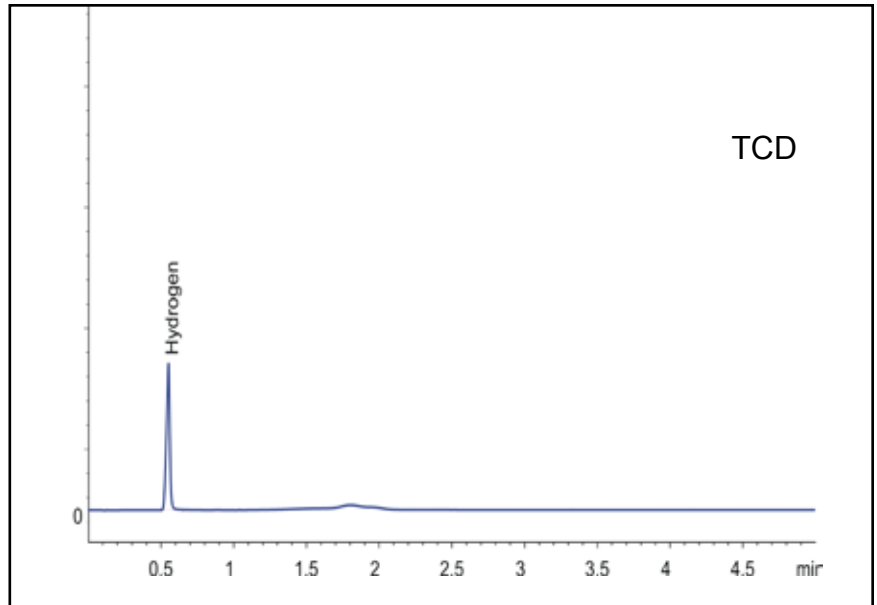
Hi-Speed RGA analysis of a calibration gas in five minutes

**GAS ANALYSIS SOFTWARE EXCELLENCE™ (GAS$^{XLNC™}$)**

AC developed the new GAS$^{XLNC™}$ program that offers an extensive range of report options and allows a multilevel calibration and accurate calculation of gas properties according to standard methods:

*   ASTM D 3588, D 2598
*   DIN 51666
*   ISO 6976
*   GPA 2172

The software also include calculations for oxygen correction (ISO 6974-3) and bridge calculation.

CUSTOMIZED REPORTING & AUTOMATED CALCULATIONS

The dedicated software design enables you to add customized calculations or edit existing calculations, and is compatible with major chromatographic data systems.

GAS$^{XLNC™}$ *Main Screen*

GAS$^{XLNC™}$ *Calibration Browser*
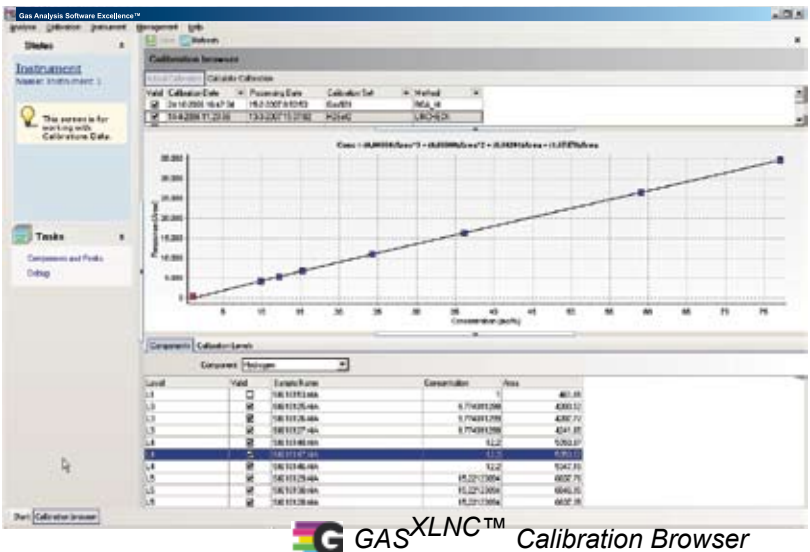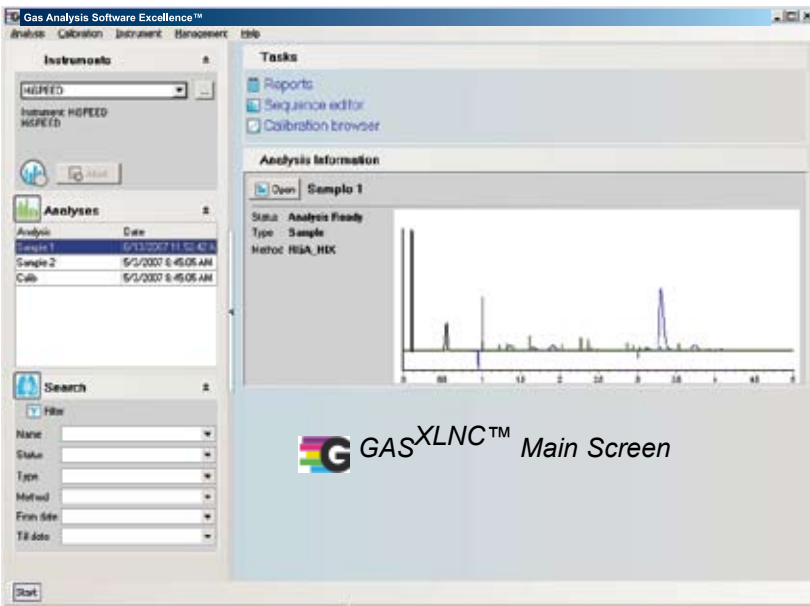
MORE FEATURES & BENEFITS

*   **Secured & Reliable** Data Management

*   **Self Explanatory** Operation

*   Use of **Plugs-ins** Allowed:
    The framework allows adding of plug-ins that offer optional features. The main application functions autonomously, adding plug-ins will not change the main application.

*   **Management Procedures** Included:
    - Function access for users & groups
    - Traceability of analysis & calibrations
    - Trend analysis option; to monitor the instrument performance in time
    - Approval of analyses: to block approval analysis for changes
    - LIMS connectivity (manually or automated)

*   **Calibration Management**:
    - Secures all calibrations performed. Analysis can easily be recalculated with other calibration data.
    - Calibration browser validates the calibration analysis and can be used to view analyzed calibration sets. The screen displays a calibration plot and the used calibration analyses. Calibration analyses can be validated or discarded.

*   **Calibration Features:**
    - Single level
    - Bracketing
    - Multilevel according to ISO 6974-2
    - Use of Absolute AND Relative Response Factors

*   **Advanced Peak Identification** for:
    - Individual peaks
    - Group identification
    - Unknown handling

*   **Uncertainty** Calculations
    Error propagation according to ISO 6974-2 is used to calculate the uncertainty in the normalized data and in the derived properties

EXCELLENT DETECTABILITY

The use of treated tubing to avoid adsorption of (Sulfur) compounds contributes to more accurate results and a higher reliability of data.

The quantification limit (QL) of the AC Hi-Speed RGA system is:
- 0.02% for inert gases
- 0.01% for hydrocarbons
- 0.1% for hydrogen sulfide

Gas and Liquid Sampling Device

GAS AND LIQUID SAMPLING DEVICE

AC Analytical Controls offers a special unit to introduce gas samples to AC gas systems. The Gas and Liquid Sampling Device allows customers to easily connect the sample cylinder to the holder unit and to measure the gas flow. The additional unit can be linked to the GC.

ADVANTAGES OF GAS AND LIQUID SAMPLING DEVICE
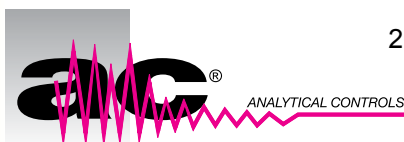
The operational advantages are:
- Easy and leak free connection to the GC
- Repeatable injection volume for gas and LPG
- Improved precision of external standard analysis of impurities in ethylene and propylene

FEATURES & BENEFITS

- ✔ Characterizes the composition of petroleum gases within five minutes
- ✔ Allows the analysis of a broad sample scope
- ✔ Uses the new Agilent 7890 Series Gas Chromatograph
- ✔ All flows and pressures are EPC controlled
- ✔ Includes automated sample shut-off valve
- ✔ Cost-effective design allows refiners to combine three subsystems in one analyzer
- ✔ Robust system uses inert tubing resistant to corrosive materials
- ✔ Meets the requirements of UOP 539, DIN 51666 and ASTM D 2163
- ✔ AC GAS^{XLNC}™ software automates gas properties calculations

- ✔ AC GAS^{XLNC}™ software allows single or multi-level calibration according to ISO 6974-2
- ✔ The AC Gas and Liquid Sampling Device offers a variety of operational advantages
- ✔ Excellent detectability
- ✔ Instrument delivery time within three weeks
- ✔ A global network of AC certified support engineers commissions the system on-site in two days
- ✔ Includes one year hardware and application warranty
- ✔ Includes free helpdesk assistance to any hardware or software related questions
- ✔ Optional on-line remote support by LAN connection available