TAURUS METROLOGY, LLC

Overview of the Analyzer

The TarMet analyzer combines microfluidics with spectroscopy to create a very sensitive detector for difficult to measure chemistries. Use of advanced microfluidic components, common to HPLC and GCs, allows the use of processes and reagents usually confined to a technician in a laboratory. Combined with the powerful automation of an Allen Bradley PLC and Rockwell Software, this instrument allows a level of real-time concentration monitoring and control previously unobtainable.

Applications

- Monitor and Control Blending
- Real-time Tank and Loop Monitoring
- Bottle Samples
- Bath Life / Chemical Decay
- Waste, Effluent, Contaminant Monitoring

Principal of Operation

For many applications, a colorimetric reaction between an indicator and sample is quantified using spectroscopic methods. This is usually absorbance or fluorescence, though many other techniques, detectors, and sensors can be incorporated. The quantified result of a measurement is referred to generally as the signal or response. Three known standards, spanning the concentration range of interest (Low, Target, and High), are sampled to create a calibration curve. An unknown sample's concentration is then calculated from the calibration curve.

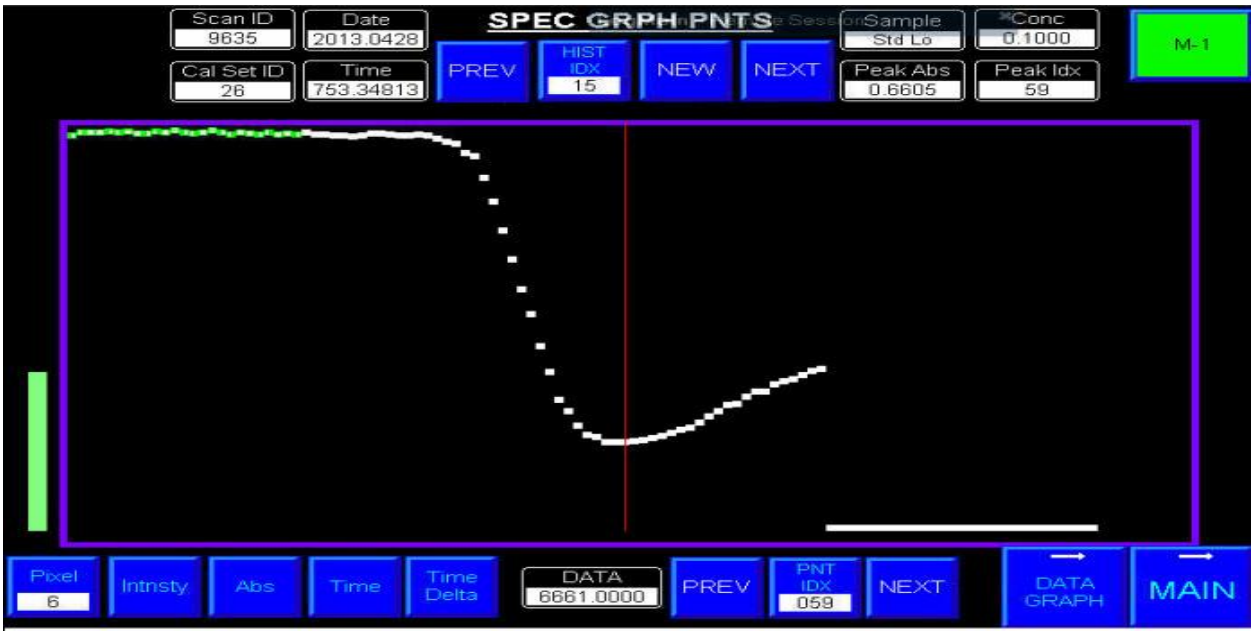
Sequence of Operation

1) Calibration – The three standards are run and validated for absolute response values, linearity, slope, intercept, and deviation.
2) Initialization – The target standard is run, repeated, and checked for deviation.
3) Measure Unknown – Multiple samples may be analyzed.
4) Measure Standard – Validate with previous results, update calibration intercept as needed.

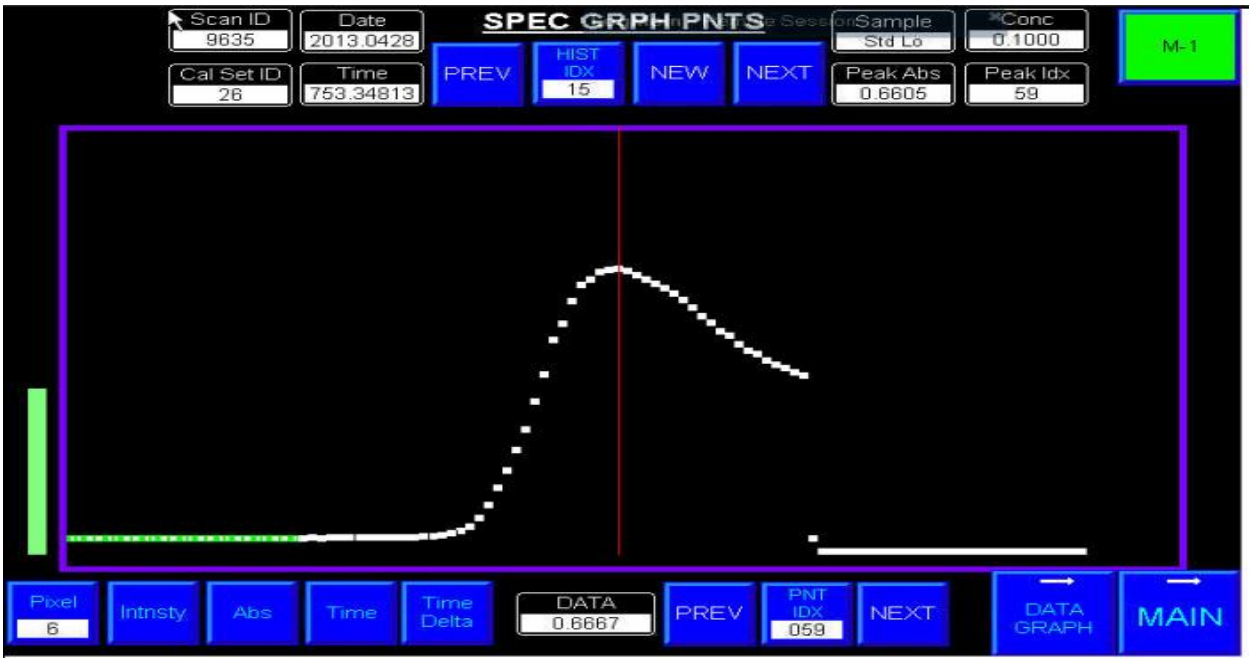
Taurus Metrology - 9999 SW Avery St – Tualatin - OR - 97062
+1-800-755-7694 / +1-503-692-9004 / robertm@tauruspower.com

The Process

A microliter capable pump aspirates precise volumes of sample, reagent(s), and indicator into a holding coil, and then dispenses it through a flow cell. A spectrometer monitors the light passing through the mixture as it flows by, producing a graph of light intensity over time.



The intensity data is converted into absorbance.



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Using Beer's law, the maximum absorbance value (indicated by the scooter in the absorbance plot above) is proportional to the concentration of the chemical. The sample history is plotted here.