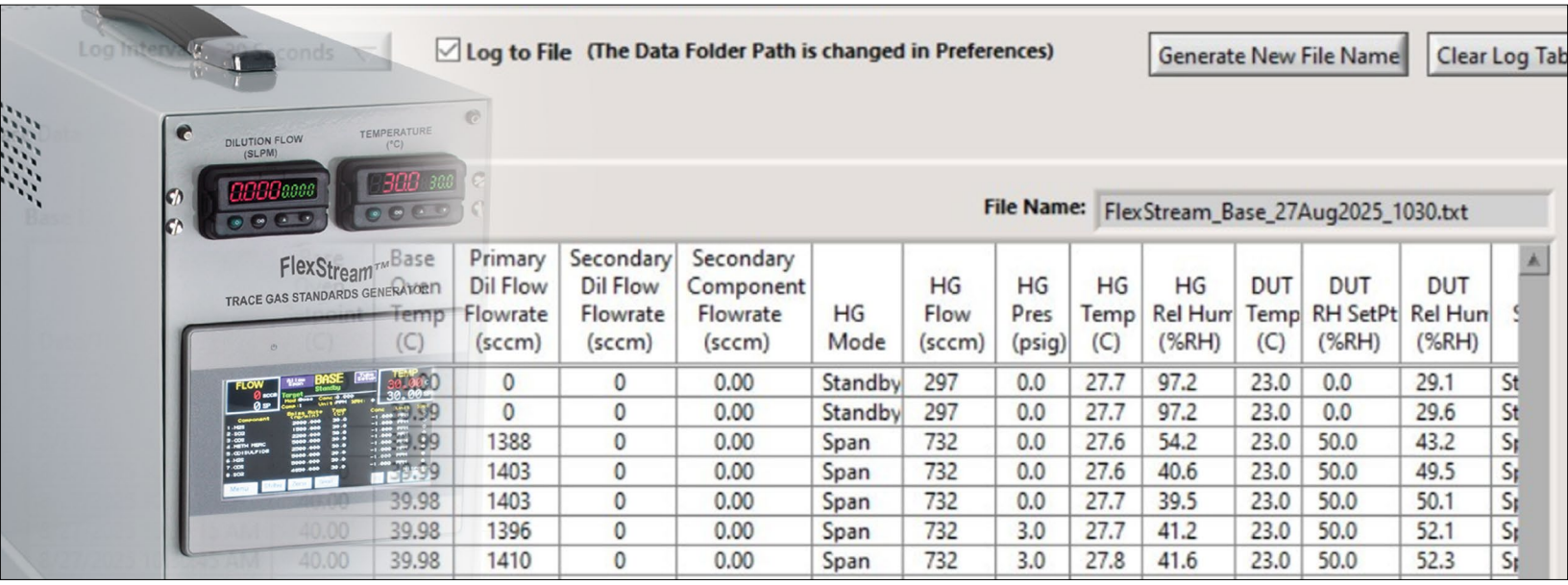
KIN-TEK
The Calibration Specialists

The Importance of Data Acquisition in Gas Analyzer Calibration



Base Oven Temp (C)	Primary Dil Flow Flowrate (sccm)	Secondary Dil Flow Flowrate (sccm)	Secondary Component Flowrate (sccm)	HG Mode	HG Flow (sccm)	HG Pres (psig)	HG Temp (C)	HG Rel Hum (%RH)	DUT Temp (C)	DUT RH SetPt (%RH)	DUT Rel Hum (%RH)	S
0	0	0	0.00	Standby	297	0.0	27.7	97.2	23.0	0.0	29.1	St
0	0	0	0.00	Standby	297	0.0	27.7	97.2	23.0	0.0	29.6	St
39.99	1388	0	0.00	Span	732	0.0	27.6	54.2	23.0	50.0	43.2	Sp
39.99	1403	0	0.00	Span	732	0.0	27.6	40.6	23.0	50.0	49.5	Sp
39.98	1403	0	0.00	Span	732	0.0	27.7	39.5	23.0	50.0	50.1	Sp
39.98	1396	0	0.00	Span	732	3.0	27.7	41.2	23.0	50.0	52.1	Sp
39.98	1410	0	0.00	Span	732	3.0	27.8	41.6	23.0	50.0	52.3	Sp

Acquiring data to verify the performance of an instrument is vital for traceability and analysis of trends for accuracy, reliability and compliance. Most gas analytical devices have integrated software to capture analytical data for comparison to a saved calibration. However, there are limitations in the ability to directly compare analyzer response data and gas standard values during calibration if a cylinder gas standard is used. Calibration information provided for the cylinder is static and relative to when the cylinder was analyzed not when it is used during calibration so differences may exist that affect overall calibration performance without the user's knowledge. Actively recording calibration gas data as it is generated creates unique advantages over traditional cylinder gas calibration and is done using a permeation system.

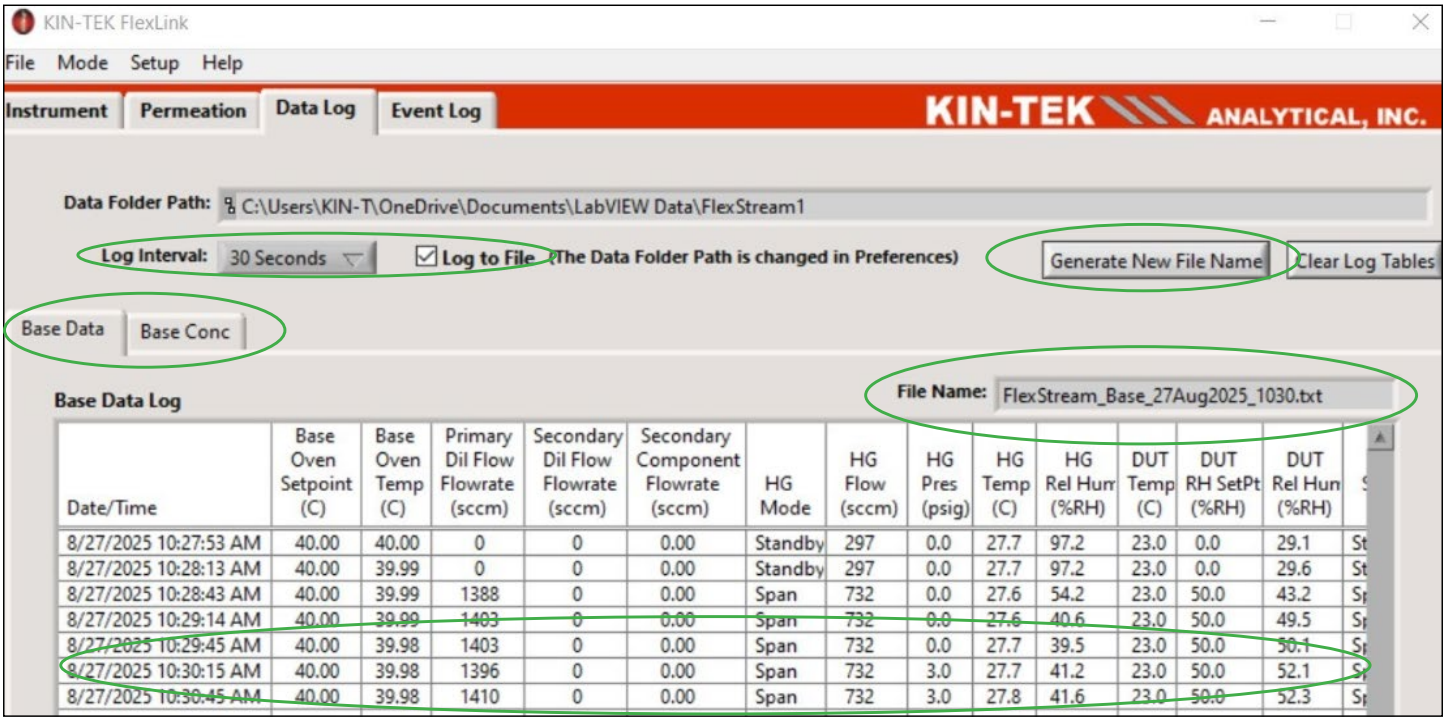
Actively recording calibration gas data... creates unique advantages over traditional cylinder gas calibration.

Advantages of FlexLink™ Software for data acquisition...

The FlexStream™ gas standard generator (Permeation System) equipped with FlexLink™ Software provides seamless data acquisition that is important information for verifying data against analyzer response, ensuring reliability and accuracy of calibrations, promoting traceability with additional records, and creating records that help diagnostic efforts. Examples and further details of the importance of acquiring data during gas analyzer calibration are provided in the following paragraphs.

Real time comparison of gas standard data to analyzer performance is one advantage of acquiring data during the calibration process using a permeation system. Capturing various parameters of calibration information such as component changes in real-time provides assurance of the values sent to the analyzer. An example of data logging with FlexLink™ Software is seen in Figure 1.

Figure 1



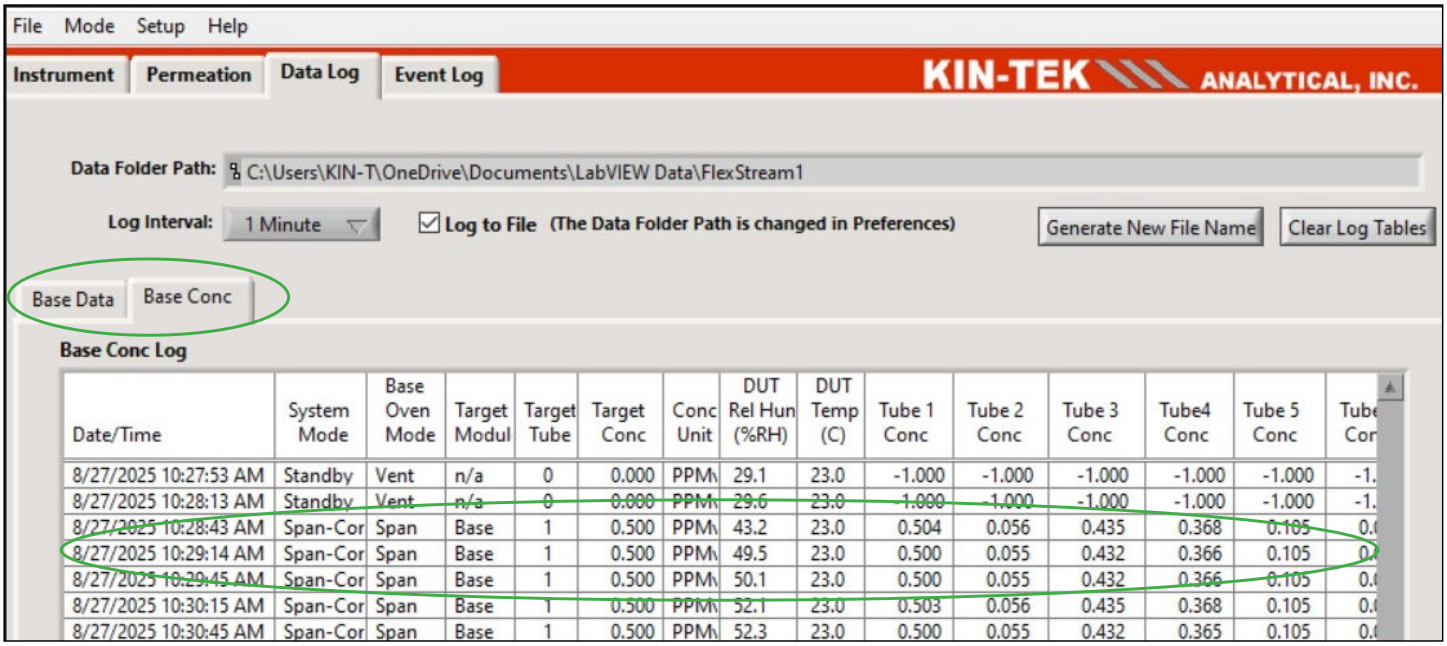
Date/Time	Base Oven Setpoint (C)	Base Oven Temp (C)	Primary Dil Flow Flowrate (sccm)	Secondary Dil Flow Flowrate (sccm)	Secondary Component Flowrate (sccm)	HG Mode	HG Flow (sccm)	HG Pres (psig)	HG Temp (C)	HG Rel Hum (%RH)	DUT Temp (C)	DUT RH SetPt (%RH)	DUT Rel Hum (%RH)
8/27/2025 10:27:53 AM	40.00	40.00	0	0	0.00	Standby	297	0.0	27.7	97.2	23.0	0.0	29.1
8/27/2025 10:28:13 AM	40.00	39.99	0	0	0.00	Standby	297	0.0	27.7	97.2	23.0	0.0	29.6
8/27/2025 10:28:43 AM	40.00	39.99	1388	0	0.00	Span	732	0.0	27.6	54.2	23.0	50.0	43.2
8/27/2025 10:29:14 AM	40.00	39.99	1403	0	0.00	Span	732	0.0	27.6	40.6	23.0	50.0	49.5
8/27/2025 10:29:45 AM	40.00	39.98	1403	0	0.00	Span	732	0.0	27.7	39.5	23.0	50.0	50.1
8/27/2025 10:30:15 AM	40.00	39.98	1396	0	0.00	Span	732	3.0	27.7	41.2	23.0	50.0	52.1
8/27/2025 10:30:45 AM	40.00	39.98	1410	0	0.00	Span	732	3.0	27.8	41.6	23.0	50.0	52.3

Users can view data as it is acquired and can choose to save the information to a time-stamped text file for export to a spreadsheet for further analysis. Selected data logging time intervals can be set depending on timing requirements or data storage capabilities. Data points are logged at intervals such as every 30 seconds or up to several minutes between each point. This interval logging works well when allowing components to stabilize after initial changes and decreases redundancy.

Information like each permeation oven setpoint and temperature is recorded and captured if a drift exists. Real time flow rates of primary and secondary sources are logged, and any apparent changes are recorded as they happen. Additional components such as humidity sensor readouts or pressure changes also contribute to the overview of information related to component changes.

The concentration tab (Base Conc) as shown in Figure 2 provides specific information of each permeation tube installed as it relates to the Target Module, Target Tube, and Target Concentration versus the actual (Tube 1 Conc) concentration. This real time data acquisition helps verify analyzer performance to known gas standard concentrations and provides a visual confirmation when stabilization is achieved. Additionally, seeing the actual values of delivered gas standard concentrations compared to the analyzer response as it happens builds confidence in reliability of the standard.

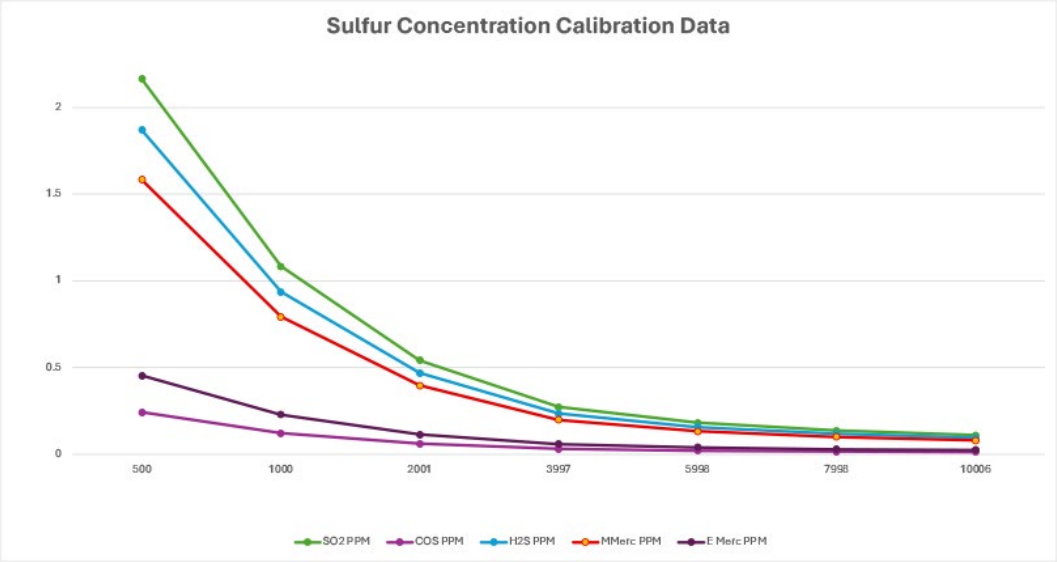
Figure 2



Date/Time	System Mode	Base Oven Mode	Target Modul	Target Tube	Target Conc	Conc Unit	DUT Rel Hun (%RH)	DUT Temp (C)	Tube 1 Conc	Tube 2 Conc	Tube 3 Conc	Tube4 Conc	Tube 5 Conc	Tube Cor
8/27/2025 10:27:53 AM	Standby	Vent	n/a	0	0.000	PPM	29.1	23.0	-1.000	-1.000	-1.000	-1.000	-1.000	-1.
8/27/2025 10:28:13 AM	Standby	Vent	n/a	0	0.000	PPM	29.6	23.0	-1.000	-1.000	-1.000	-1.000	-1.000	-1.
8/27/2025 10:28:43 AM	Span-Cor	Span	Base	1	0.500	PPM	43.2	23.0	0.504	0.056	0.435	0.368	0.105	0.
8/27/2025 10:29:14 AM	Span-Cor	Span	Base	1	0.500	PPM	49.5	23.0	0.500	0.055	0.432	0.366	0.105	0.
8/27/2025 10:29:45 AM	Span-Cor	Span	Base	1	0.500	PPM	50.1	23.0	0.500	0.055	0.432	0.366	0.105	0.
8/27/2025 10:30:15 AM	Span-Cor	Span	Base	1	0.500	PPM	52.1	23.0	0.503	0.056	0.435	0.368	0.105	0.
8/27/2025 10:30:45 AM	Span-Cor	Span	Base	1	0.500	PPM	52.3	23.0	0.500	0.055	0.432	0.365	0.105	0.

Another important factor when logging real time data during calibration is that slight drifts or apparent changes can be tracked and saved to a file format to create digital records that provide extra sources of traceability. Time stamped, logged data is an added resource that can be recalled and reviewed and compared to previous calibrations or used as records for past performances. By downloading data to a spreadsheet, graphical presentations of calibration curves or more advanced calculations can be done to determine more comprehensive feedback. For example, Figure 3 shows calibration curves of five different sulfur species simultaneously generated, and data logged for each flow and concentration change. Data acquisition of gas calibration also allows proactive changes such as determining calibration intervals, establishing stabilization times of compounds, or realizing the time of stabilization between temperature of flow changes.

Figure 3



Features of FlexLink™ Software for operating KIN-TEK's FlexStream™ Gas Standard Generator...

The FlexStream™ system can include up to six different instruments ranging from multiple ovens capable of holding eight permeation tubes each, a secondary dilution module, and a humidified gas module. No matter what combination of modules is selected for the application, data parameters are logged if a specific module is active in the series. Each module has its own controlled components with important parameters that contribute to the final calibration gas generated. Therefore, acquiring data for all components simultaneously not only is an excellent tool for generating additional reports, it provides comprehensive digital records and creates a digital record of calibration parameters of all modules. Saving the record and highlighting important data or using it to generate graphs or summaries gives additional records of calibration traceability and resources.

Another advantage of data acquisition during gas analyzer calibration with a permeation system is the overview of preventative maintenance and diagnostics it provides. Data gathered from different calibration intervals can identify anomalies that may result from a failed component or drift in electronics. For example, contaminated lines or leaks in connections may cause irregular flow settings to occur that result in a difference in data from the previous calibration. A temperature change will show a shift in concentration parameters, or an unexpected mode change will report a change in solenoid performance. Reviewing the data saved periodically highlights differences that may require maintenance before a bigger problem occurs.

Data acquisition in gas analyzer calibration is important and simplified using the FlexSteam™ system with FlexLink™ software. Despite dynamically delivering highly accurate NIST Traceable calibration gas standards to the analyzer, data acquisition using FlexLink™ software provides verification of analyzer performance parameters and promotes documentation for traceability and compliance far beyond that of a static gas cylinder. The data saved can be used for further reference as a digital resource and can be analyzed for calibration and stability intervals. Additionally, saved data can be recalled and compared for maintenance and diagnostic tools for troubleshooting differences. Data acquisition plays an important role in the calibration of gas analyzers and the FlexStream™ system with FlexLink™ software simplifies the process.

Watch video instruction on KIN-TEK's website to see how FlexLink™ software is setup and utilized to support the FlexStream™ Gas Standard Generator.

Solve Your Calibration Challenges with KIN-TEK Analytical Inc. Products

The Trace Source™ Permeation Tube technology is employed in KIN-TEK's Gas Standard Generators to provide accurate, NIST traceable calibration standards. KIN-TEK's products include a range of gas standard generators and permeation devices to fit almost any application that relies on the delivery of an accurate trace gas concentration. Individual gas generator modules can operate as stand-alone calibrators or be combined into a Gas Standard Generator System configured to solve the most complex applications. The System utilizes the FlexLink™ software that can log and export data for analysis and reference.

Contact a customer service representative now and discuss your specific application.

KIN-TEK
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KIN-TEK products are manufactured in a facility whose Quality Management System is certified as being in conformity with ISO 9001:2015 by Intertek.

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2025/10/20 Rev. 0002