KIN-TEK

The Calibration Specialists

AUTOBLEND™

Complex Mixture Generator

The **AUTOBLEND™** is a computer-controlled gas blending system designed to create flowing, adjustable concentration complex gas mixtures and test atmospheres. As a tool for chemical effects and other testing, the system introduces precisely controlled trace concentration components into a flowing, high purity matrix gas. Permeation tubes are used as a controlled source of each trace level component.

Applications

- **Evaluating sensor response**
- **Validating analytical methods**
- **Testing catalytic systems for sensitivity to contaminants**
- **Biological testing for effects of inhaled vapors**
- **Research and development**
- **And much more**

Operation

The system features six independently-controlled permeation ovens. The base gas mixture created in each oven can contain up to eight different analyte components so that a test atmosphere can be spiked with up to 48 components simultaneously.

A variable portion of each base gas mixture is added to a main dilution flow to create a primary mixture with variable concentration ratios. Two optional dynamic headspace saturation modules can be added (as shown in bottom cabinet) to allow the addition of vapors from potential transient interfering compounds such as cleaning solutions, fuels or paints. A secondary dilution feature provides a large dynamic concentration range. The resulting test atmosphere can be supplied either dry or at variable humidity levels.

AUTOBLEND™ Server Software

Designed for use with the AUTOBLEND™ instrument, the Microsoft® Windows PC-based AUTOBLEND™ Server software:

- Manages an inventory of methods, permeation tubes and headspace mixtures.
- Analyzes the feasibility of creating a specified mixture.
- Calculates the setpoint data required to adjust the system to achieve the mixture.
- Dynamically maintains the mixture under changing conditions.
- Logs operating data and test mixture results.

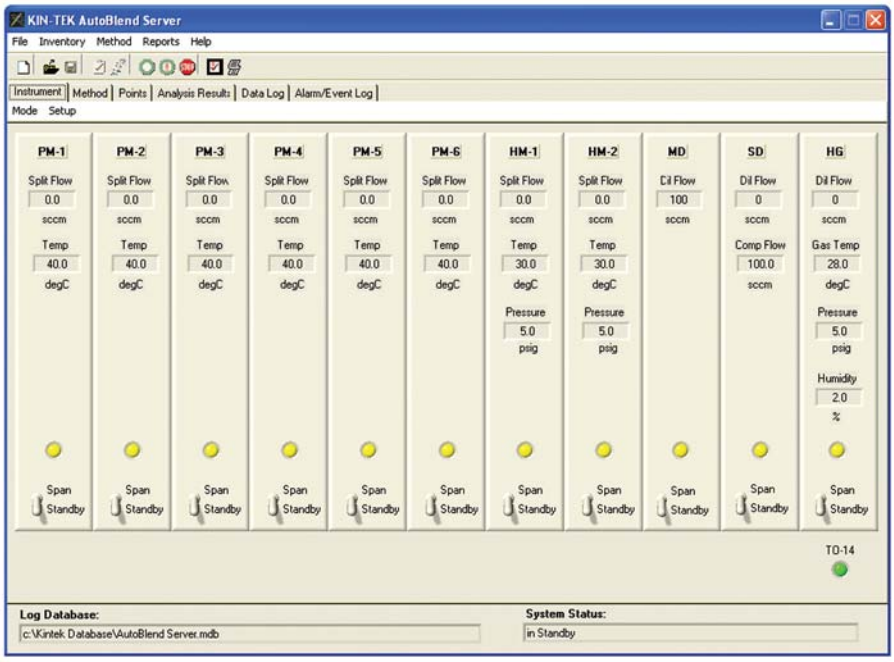

Fig. 1 – Virtual Instrument of the AutoBlend™ System

Features

Permeation Tube and Headspace Inventory Management

The AUTOBLEND™ Server software contains a database of the user's permeation tube and optional headspace inventory including tube ID and serial number, compound name, emission rate data, temperature alarm criteria, and expiration date (see Fig. 2). As the expiration date approaches, the tube is highlighted to warn the user to reorder or recertify.

The following figure shows an example inventory of permeation tubes.

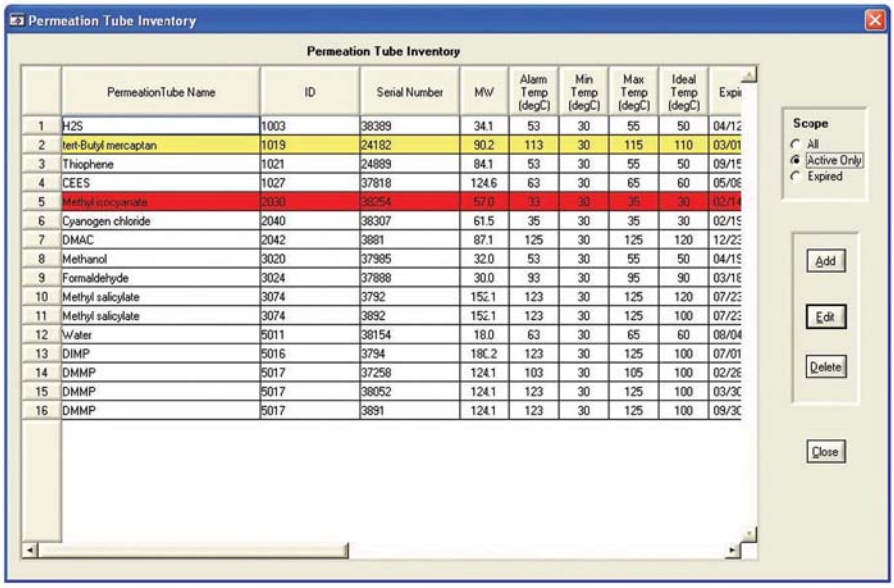

Fig. 2 – Permeation Tube Inventory

Method Inventory Management

As specific complex gas mixture sets are defined, the details of the components (permeation tubes and head-spaces) and required concentrations of up to 20 span points are saved as a method. These methods are saved in an inventory for easy recall and duplication of the mixture at a later date.

Data Logging

During a method run, the AUTOBLEND™ Server software periodically logs generated concentrations for each point in the method (see Fig. 3) and logs measured values of all operating parameters. Should an unexpected test result occur, the historical data can be checked to verify the mixture and operating conditions such as oven temperature, flow rates, pressures and so forth.

Scenario Analysis

The AUTOBLEND™ Server software set includes a “Scenario Analyzer” CD that allows the user to establish offline the feasibility of achieving a desired mixture. Given desired concentrations, the “Scenario Analyzer” software tests the possibility of creating the mixture from specific permeation tubes and headspaces under specific operating conditions. This feedback is invaluable in creating a workable method and can be a major time saver.

System Monitoring

AUTOBLEND™ system functions are monitored in the software and “out-of-specification” values are reported. For example, the software warns of “over temperature” conditions in the permeation ovens, impossible flow settings, out of range temperature setpoints (for the installed permeation tubes), etc.

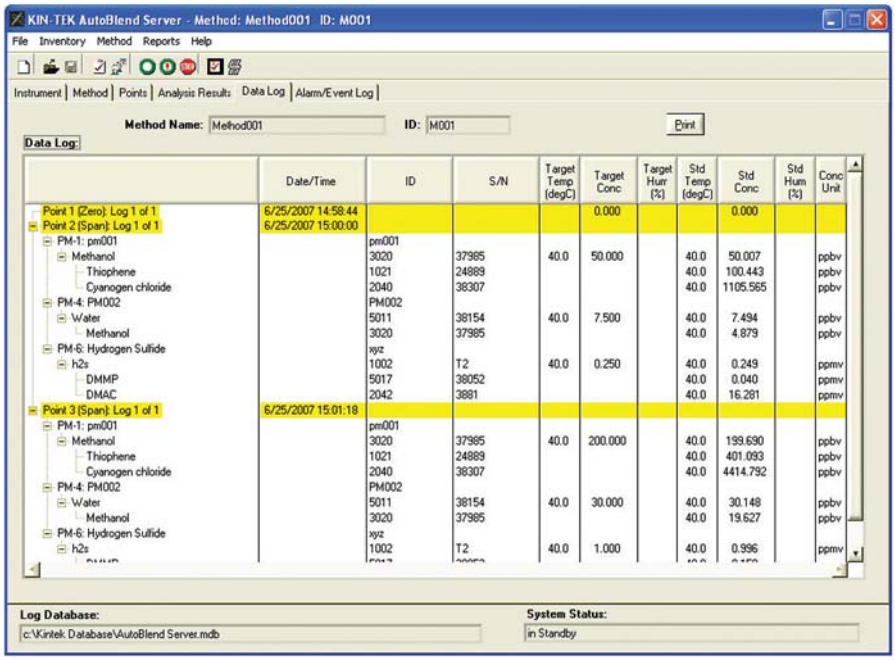

Fig. 3 – Data Log

Enhanced Functionality

The actual permeation rate from each tube varies with temperature. The AUTOBLEND™ Server software can correct to actual or estimated temperature depending on supporting data available for the tube. When multi-point certification data is available, the correction is exact at the temperature of the defined certification point, and estimated with a linear or log-linear algorithm when at an uncertified temperature point.

Remote Access Software

The AUTOBLEND™ Server software can be configured to allow remote monitoring and remote control of the AUTOBLEND™ instrument from another workstation within an Ethernet network. KIN-TEK provides AUTO-BLEND™ Remote Access software and source code developed with National Instruments LabVIEW.

System Requirements

The AUTOBLEND™ Server software runs on Microsoft® Windows 2000 or XP with an RS-232 serial port (or USB-to-RS232 adapter) connected to the AUTOBLEND™ Complex Gas Mixture Generator. The AUTOBLEND™ Inventory and data logs are stored in a Microsoft Access database (Microsoft Access is not required to be installed). The software requires about 15 MB of hard disk space plus extra storage space for the database.

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