

## Canary-Three™ w/ Intelligent Sampling for Speed and Precision

The Canary-Three™ is the industry's first handheld intelligent gas sensor. Although similar in appearance and feature set to the Canary-Two™, it incorporates both a simple detector path for rapid screening and a micro-GC and second detector for selectivity and specificity. Smart sample collection has many benefits, ranging from increased linear dynamic range to protecting the system from being overwhelmed by high concentrations. More importantly, the system provides results fastest when concentrations (and dangers) are greatest. Smart sample collection isn't available in any other commercial system.

The system components are shown in figure 2, with a schematic layout in figure 3. Since this gas module has a footprint approximately the size of a credit card, a number of such cards can be individually tuned for a diversity of chemicals and operated in parallel. The gas module is available separately for OEM applications.

### Representative Data

Figures 4 and 5 are data from Defiant's prototype smart sample collection system. The red trace in both figures is the power on the preconcentrator. The pulse observed in those figures indicates thermal desorption. The blue trace is the response from the GC detector. The green trace is the response from the sample screening SAW. Figure 4 is a chromatogram of mid level concentration of DMMP. The prescreen of that concentration, shown expanded at the top of the figure 5, instructs the system to collect a sample for a longer period of time.

The chromatogram in lower parts of figure 4 shows the result when the concentration is 10 times higher. The prescreen of the ambient concentration, shown in the bottom half of figure 5, triggers a sample collection time approximately 10% as long. Comparing the chromatographic peaks for these two analyses highlights the linearity for increasing sample collection times.

### Features and Specifications:

- Intelligent sample collection for analysis speed and precision.
- Dimensions & weight: 7.5x5.25x2.25 inches, 1.6 lbs (760 g).
- Power: 4 hours on rechargeable Lithium polymer batteries or external 9V, 2A power.
- Computer interface: Standard RS-232 port
- Display: 2.1x0.75 inch LCD
- Ambient air is the carrier gas, no need for specialty gases.
- Demonstrated detection of BTEX, TCE, & PCE.

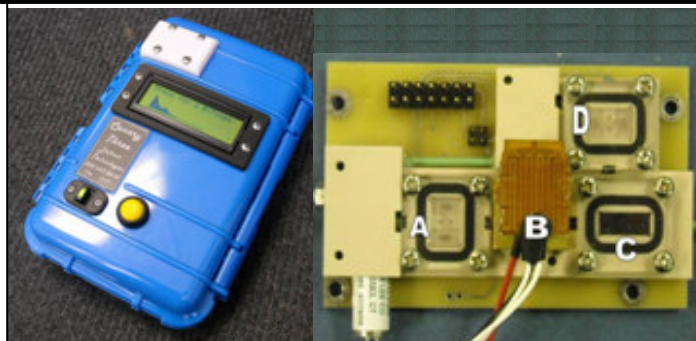


Figure 1. Canary-Three™ package.

Figure 2. Canary-Three™ gas module. C is the preconcentrator, B the micro-GC and A the detector. D is the screening detector.

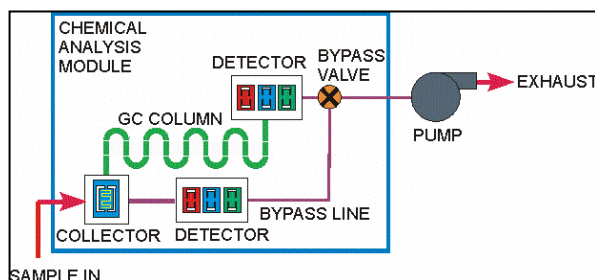


Figure 3. Canary-Three™ analysis chain.

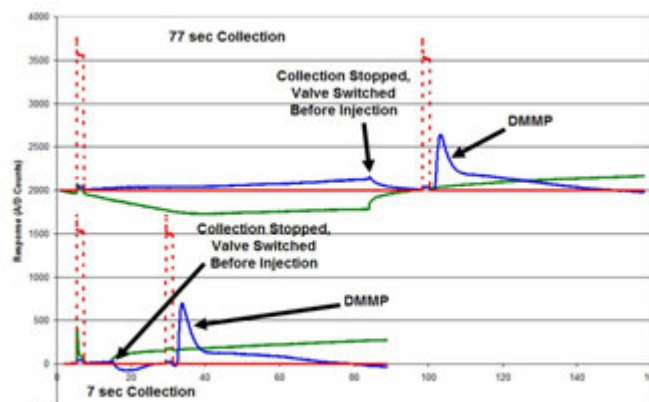


Figure 4. Intelligent sample analysis.

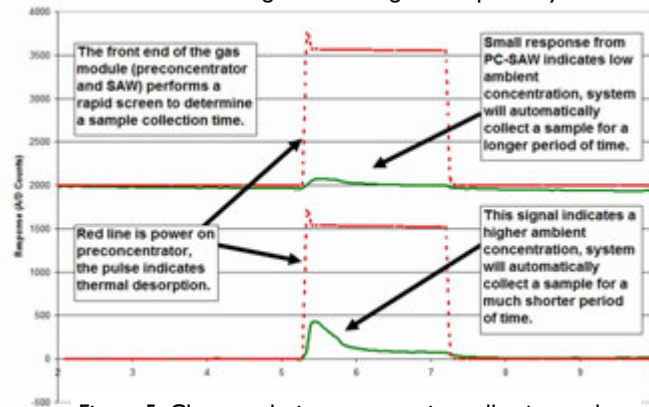


Figure 5. Close up during prescreening collection cycle.