

A Tale of Datalogging, Downloads And Docking Stations:

One Safety Director's Quest to Slay the Dragon

By Dave Kuiawa

Once upon a time there was a gallant knight in shining armor who was in charge of keeping all the citizens of his kingdom safe from unseen foes, dragons and the like. Does this sound familiar? Only the knight was no ordinary knight and his kingdom was no ordinary kingdom. The knight in shining armor is today's safety director and is tasked with maintaining the health and safety of all workers within the company, plant or division.

In this story, our safety director was most concerned with protecting the plant's workers from the dangers of unseen gas hazards. In addition, the kingdom's edicts required minimum levels of exposure and regular monitoring of the environment. His plant was full of the hazards, and while most of the time hazards were under control, danger lurked in every confined space. This safety director had one thing in common with his peers; he was only one person being asked to do multiple jobs. Eventually, it got to be too much. He needed to find an automated solution.

The Plot Thickens

Our safety director knew one thing: Gas monitoring instrument calibration and record keeping were key to ensuring and documenting his worker's safety. But trying to move from the company's calibration notebook to an automated PC system seemed like a tall task. Deep down he knew that the only way to be certain that a gas monitor would see its intended gas or gases was to check, or "bump" test frequently, and calibrate the monitor if it failed to pass a "bump" test. With

this in mind, he set out on a noble quest to find a solution that would relieve this burden, do it automatically and shift the liability from his shoulders.

Also, he knew that datalogging workers' exposure to hazardous gases was vital to documenting incidents and investigating workers' compensation claims. The safety director set out to find a flexible multi-gas monitor with datalogging that could be configured to his plant's specific needs, and then reconfigured without cost to meet his future changing needs.

The monitor would need to be calibrated automatically with all the records being stored on a central, networked PC and downloaded data would also be transferred from the gas monitor to the same PC at the same time.

Our Hero Finds the Holy Grail

The Holy Grail was a multi-gas monitor with Docking Station compatibility. Initially, the instrument could address a variety of gas hazards. It could be configured as a one, two, three, four, five or six gas monitor. It was compact and lightweight, so it was easy for his workers to carry and did not get in the way during confined space entries. The unit was available with a sampling pump that was smart enough to continuously monitor its flow and adjust it so that the monitor always received the proper volume of sampled gas. If the unit needed to be used over time, that was also within the capability of the monitor, which was powered by lithium-ion, technology and could operate for 24 hours on a single charge.

Datalogging Plays an Important Role

The feature that had the most value in limiting his company's liability and directly making his job easier was the datalogger. The datalogger was vast, providing him with 18,000 data points. Because this is a function of the readings he logged, he could log for 300 hours in one-minute intervals, 1,500 hours in five-minute intervals, and 50 hours with second-by-second exposure logging.

Initially, he could log continuously and the datalogger would fill up and stop, alerting his workers that it was full and needed to be downloaded.

The second datalogging method was the one that he called the "black box" method. Running the instrument in this mode allowed the datalogger to accumulate data until it was full; then it would automatically overwrite. But his favorite way to operate the datalogger was to use event logging. Event logging meant that the data logger sat idle until the instrument went into alarm. At that point, the datalogger would begin to accumulate data on a second-by-second basis, providing him with a precise picture of the event or exposure. If the datalogger was not active, all was well. If the datalogger began to log, he would capture all of the exposure data above the permissible exposure level.

Another way he found to "validate" the data was through user and site identifications. These were built into every unit and could be manually entered through the instrument's keypad. A unique feature was the instrument's dime-sized stainless steel

devices that have a microchip inside. They require no power and can be placed onto employee badges and confined space placards. When contacted with the instrument, these devices will actually transfer the data into the instrument's datalogger. Now the safety director was able to document an employee with a given gas monitor and record their gas exposure in a given location.

Slaying the Dragon

He still needed relief from the burden of calibration, record keeping, and downloaded data management. Unfortunately, this was still the real world, and OSHA did occasionally

come calling, wanting to see documentation.

The Docking Station provided a space for employees to place their instruments for recharging at the end of a shift. But to the safety director, it did much more. It gave him control over when his gas monitors were "bump" tested, calibrated, downloaded, diagnosed for potential problems and even reprogrammed. Regular testing and calibration was programmed to occur automatically without human interface. Bump test and calibration data are kept electronically in report form, and sensor strength trend graphs are maintained in case they need to be referred to at a later date.

Exposure data was a vital part of his safety program, so he set up the station to download every time a gas monitor was placed on it. The files were placed in a directory and were sorted by instrument serial number and download date

This story, of course, has a happy ending, as the workers of this plant are continuously protected from gas hazards with trusted instruments that are continuously "bumped," calibrated, and documented. And with that, our safety director lived happily ever after.

The end.

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What's New in Air Monitoring

As the safety industry understands the hazards presented by hazardous contaminants in the air, equipment and procedures are changing. Bill Kamp, national sales manager, Thermo Electron Corp., Environmental Instruments, Franklin, Mass., "...The majority of the change has come from a greater understanding of risks due to exposure. Many end-users are using the instrument's data logging features to determine the exposures that their workers are exposed to in the hazard. This has become easier for them, because the instruments allow the TWA

[time weighted average] and STEL [short-term exposure limit] to be recorded automatically. In addition, more customers are making sure that the instruments are properly maintained by a qualified individual. There seems to be less dependence on a machine to ensure that the instrument is working properly and has been calibrated.

Jon Scott, industrial hygienist, Nextteq LLC, Tampa, Fla., notes that homeland security has introduced a new need among first responders. "Detecting chemical and biological warfare agents is no longer only an issue for military personnel; with the

advent of the Homeland Security Act of 2002, civil defense is now a requirement for all first responder teams. Traditionally, HAZMAT kits have only had the ability to detect these agents in gas or vapor form; however, the most common chemical warfare agents are delivered as either an aerosol or a liquid." Scott notes that chemical warfare detection tests are now available in HAZMAT kits to ensure that users have the ability to measure gases, vapors, aerosols and liquids. In addition, tools are currently available to provide a more specific quantitative measurement of chemical warfare agents. **CM**