

# IPPT

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### A Paradigm Shift In FIXED-POINT GAS MONITOR Maintenance



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## A Paradigm Shift in Fixed-Point Gas Monitor Maintenance

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"Change Oil Soon." Have you ever seen this message or warning light come up on your vehicle's dashboard or center console? It is your vehicle's way of reminding you to do routine maintenance in order to sustain good performance. Some may consider it a nuisance. Others see this message as a blessing. Before cars were smart enough to monitor the life and viscosity of oil, drivers had to write down dates and mileage of oil changes and try to remember to do this routinely. For some, it was done religiously. For others, not until it was too late.



What does this have to do with gas detection? Simple. Gas detection devices are like the vehicle mentioned above. They need maintenance to make sure that they are working properly and capable of doing their job when gas events occur. Gas monitor maintenance has become a very important topic of discussion, and much focus has been placed on both portable and fixed-mounted gas detectors.

More often than not, maintenance of fixed gas detection systems is overlooked or done less frequently than with portable instruments. The design and layout of the systems can make maintenance extremely time consuming and difficult. Detectors can be spread out over entire plants or placed in areas that are not easily accessible. This can make maintenance difficult, but not impossible. Many times, there are other issues within plants and refineries that take higher priority than maintenance of the gas detection system. As a result, function tests and calibrations are delayed or completely overlooked.

To solve these problems, the patented DS2 Docking Station has been developed for the iTrans™ fixed-point gas monitor by Industrial Scientific. This system, the first of its kind, was designed to increase the safety and reliability of fixed gas detection systems. The iTrans™ DS2 performs function tests and calibrations on a routine schedule, or on demand remotely from a computer console. This eliminates the need to send a person out to manually perform these tasks for each detector in a facility.

### Function (Bump) Testing

A function test consists of applying a known concentration of gas to the sensor to ensure that the sensor's response exceeds the lowest alarm set-point. If the sensor does not respond properly, the filter may be blocked by dirt or debris, or the sensor needs to be calibrated. Function tests are done to ensure the sensors and detector are still working properly. Without performing routine function tests, how can you know if the sensors are still working?

Currently, these types of tests are conducted by a field technician carrying a cylinder of gas around to each gas detector. The technician may have to climb a ladder or go over pipe racks to reach the sensor. Once at the sensor, the technician must put the instrument into a test mode, and then apply gas from a cylinder that the technician is carrying. Sometimes the task itself can be a safety concern for them.

Automating this process increases the reliability of the system, and increases safety within the facility. Safety levels will increase due to the fact that the instruments are being tested and proven to work. Moreover, the personal safety of technicians will increase from not having to conduct these tests while standing on ladders, lifts or in hazardous environments.

Function testing is not only a way to confirm that the instruments are working properly.

ly. For some sensors, testing conditions them. Sensors for gases such as chlorine need to see gas regularly for them to be accurate and responsive. Function testing more frequently will condition these types of sensors so that when a gas event occurs, they will respond quickly.

### Calibration

All sensors require routine calibration. Calibration adjusts the instrument to the sensor's output to make sure that it is reading accurately. Calibrations should be performed on a routine basis and if a sensor fails a function test. If a sensor fails a calibration, it should be replaced and the new sensor should be calibrated after it has been installed in the detector.

Manufacturers' recommendations on calibration flow rate and calibration concentrations should be followed to achieve the most accurate and precise calibration. Calibration gas should be checked to make sure that it has not expired and that it meets the manufacturer's specifications.

The same worker concerns for function testing also exist for calibration. Automating this process will increase sensor accuracy, safety and reliability of the gas detection system.

### Maintenance Schedule

Maintenance should be performed regularly on fixed gas detection systems. Many manufacturers recommend function testing on a monthly basis. Sensor calibrations should be performed at least once a quarter. The frequency of maintenance is best determined by end-user policy or local regulations. More frequent maintenance will result in the detection of potential failures earlier, and downtime can be reduced or ultimately eliminated.

Maintaining a service and maintenance program can be difficult. Logistically, it may be difficult for companies that don't have enough workers to maintain all of the fixed gas detection points as well as other systems in the facility.

Automating the maintenance program through the patented DS2 Docking Station will ensure that instruments are properly maintained and running. The DS2 allows users to set the maintenance program to their own desired schedule so that function tests can be run weekly and calibrations conducted monthly. At any time, a technician can use the system's interface to remote-start a function test or calibration on any instrument in the field. This allows for exception testing or for testing at more opportune times.

### Record Keeping

The automated system also keeps track of all data in a common database. This eliminates the need to manually write details into a log book. At any time, calibration or function test data can be retrieved, reviewed and analyzed. Technician notes can be added to the database for exception recording and note taking. Keeping all data in one common, accessible area is a significant improvement to current practices, and is quickly becoming an industry best practice.

### Automatic Notification and Replacement

Once a problem like dying or bad sensors is discovered, new equipment needs to be ordered. Working in conjunction with the DS2, Industrial Scientific's iNet Instrument Network can automatically notify customers via e-mail whenever a problem is detected. If the DS2 finds a dying sensor, the iNet program can send a replacement sensor before the current sensor dies. This eliminates downtime and increases safety.

The iNet program can also monitor calibration gas usage and filter life. When gas levels are low, the system notifies the user with a low cylinder warning and sends new calibration gas before the cylinder actually runs out.

### Maintenance by Exception

Moving toward an automated maintenance system for fixed gas detection is a paradigm shift for the industry. It eliminates many of the pitfalls and deficiencies of existing maintenance programs. Automating the process allows technicians to focus on maintaining other systems core to their business. Maintaining the gas detection system whenever sensors or cylinders need to be replaced can then be done on an exception basis.