

# Gas detection, telemetric monitoring for early warnings

SCHALK BURGER | FEATURES REPORTER

**G**as detection and telemetric monitoring systems in firefighters' equipment enable commanders to track the movement of firefighters inside a building to give an early warning of gas levels and to determine how much air is left inside an oxygen tank.

All data is transmitted to a mobile command station from where commanders can monitor firefighting and search and rescue operations, says safety equipment manufacturer MSA product line manager **Dharmesh Lakmidas**.

The heads-up display (HUD), to be released this year, will enable the information from monitoring systems to be displayed on the visor of an emergency worker's helmet. The HUD uses radio to transmit the information and MSA will need to get a licence from the Independent Communications Authority of South Africa before it can launch the product, he says.

The company recently sold 1 200 gas detectors, which measure hydrogen sulphide (H<sub>2</sub>S) gas levels, to crude oil refiner South African Petroleum Refineries' refinery in Durban. These detectors are provided to contractors who help clean the refinery. It has a preset alarm that will alert individuals before dangerous exposure levels of H<sub>2</sub>S gas are reached. Information from the detectors can be downloaded and the data can be analysed to determine the trends of gas exposure, Lakmidas explains.

MSA's Altair 5 multigas detector system measures levels of five dangerous gases. MSA gas detector systems also have motion detection sensors that automatically trigger after 30 seconds if the device detects no movement from an individual. For example, it can alert supervisors to when a person has collapsed and is commonly used by people working in isolation.

MSA product manager for fixed systems

**Emmanuel Manaka** says the company has developed its Flameguard system that uses ultraviolet light, infrared light or a combination of the two to detect sources of heat, such as smouldering coal or flammable petroleum vapours or gases in storage tanks, before a fire starts. This system can be coupled to a fire suppression system and is fully automated.

The company is currently installing its Flameguard system for mining companies Xstrata's and Exxaro's coal-mining operations. Coal, which can ignite under certain conditions, often travels long distances in conveyor belts without supervision and the Flameguard system is used to detect potential fires and douse the heat source with water and a fire retardant chemical, he says.

Further, MSA has developed the Galaxy system, which uses a module containing a cylinder filled with gas that is used to test the sensors remotely on a gas detection system every day. The system does not need maintenance but the calibration gas needs to be replaced every four months to a year, Lakmidas says.

The system is designed to calibrate gas detection equipment that might have been dropped or exposed to humidity or heat, which can cause the device to display incorrect values, he states.

## Thermal Imaging Camera

A hand-held thermal imaging camera can be used to find people hidden by smoke or dust-filled rooms where the rescue worker cannot see clearly. The camera is sensitive enough to show the heat signature of a person and shows rescuers the outline of the person, Lakmidas says.

The thermal imaging camera has a temperature range of 0 °C to 500 °C and uses different colours for temperature ranges, which means that firefighters can see different heat sources and their relative temperatures. This enables firefighters to fight structural fires by determining the source of heat with the highest temperature and fighting that source. The camera also checks if there are any heat

Some cause happiness wherever they go;  
others, whenever they go.

— Oscar Wilde



**DHARMESH LAKMIDAS**  
Funding is a significant challenge for the fire industry



**EMMANUEL MANAKA**  
MSA's Flameguard system detects sources of heat before a fire starts

sources in electricity distribution boxes caused by short circuits or damage.

The camera is also used to find leaks in pipes in the oil, gas and petrochemicals industries. Police also use the thermal camera to find suspects hiding in dense vegetation.

The camera has been tested and approved by the US National Fire Protection Association, Lakmidas explains.

The newest version of the camera, the 5800, released by MSA last year, has a more refined colour coding of temperature ranges that enables more accurate measurements.

When a thermal imaging camera moves from a high-heat source to a lower-heat source, the camera often takes a few moments to adjust from over-exposure before showing the lower-heat source.

The latest version of the camera automatically changes between its low-heat and high-heat functions, enabling it to change from high- to low-heat sources quickly, he explains.

MSA recently sold one 5800 camera to a major platinum-mining company that uses it to check through dust in a mine or to see if there are any people in the mine, he says.

Meanwhile, funding is a significant challenge for the fire industry, given that budgets can

often be strained by the need to replace equipment and protective gear damaged during use.

Therefore, Lakmidas points to the benefits of environment monitoring equipment, such as the gas detection devices, that will protect firefighters from prolonged exposure to dangerous gases.

Awareness of safety issues is important and he believes that government and private companies have a role to play in providing safety training.

Manaka agrees, adding that private companies must also make end-users aware of products that can help to reduce the risks to their employees.

Lakmidas says that insurance companies must also be made aware of the different types of products that are available so that they can advise their clients on possible fire prevention and protection solutions.

Meanwhile, queries and orders have started to increase during this year, Lakmidas states.

The company's sales increased in February, particularly with the increased demand for products from the coal-mining sector.

The company uses subsidiary safety equipment distribution company Select PPE (personal protective equipment) to distribute its products at over 200 on-site stores at South African mines.