# ION

## Customer Case Study

# Robot incorporates Falco for autonomous gas detection

**ExRobotics ExR-1 robot incorporates FALCO to detect volatile organic compounds (VOCs) in flammable and explosive environments within unmanned facilities.**

**EX ROBOTICS**

**Company:** ExRobotics
**Industry:** Oil & Gas production and processing facilities
**Application:** Fugitive emission monitoring
**Requirements:** ATEX and IECEx Zone 1 Gas Detector

## The Background

ExRobotics was established in 2017 to commercialise robotics technology for use in potentially explosive atmospheres found at oil and gas production and processing facilities, which are often in remote locations within harsh environments. Even on normally unmanned facilities, a human presence is generally still needed for regular inspection work, so deploying Ex certified robots (ATEX and IECEx Zone1) can have a **significant positive impact on safety by minimising worker field trips, which in turn reduces operating costs.**

*Ian Peerless,*
*Operations Director:*
*"Our robots are used in the oil and gas industry mainly for first response, fugitive emission and preventative maintenance. The introduction of more stringent fugitive emission regulations and the subsequent opening up of new markets prompted the need for a fixed gas detection instrument that could be incorporated into our remotely operated ExR-1 robot."*

*"The ION Science Falco VOC monitor was recommended by a significant player in the oil industry who conducted extensive performance tests and trials at a large refinery where the Falco came out on top. When ExRobotics did testing of its own, we found the PID instrument to be robust and reliable."*

## The EXR-1 Robot

The ExRobotics ExR-1 robot is equipped with camera's for visual inspection, microphones for sound monitoring and gas detectors for leak detection. It sends an alarm to the control-room if a leak is detected.

ExR-1 navigates autonomously through installations and find its way back to its docking station to recharge. This means that inspectors and operators can reduce their visits to remote or hazardous locations, greatly improving their work safety.

### Remote control over the public 4G network
This configuration of the robot is used for surveillance and as first responder at hazardous and/or remote sites. The operator sits in a central control facility and drives each robot in turn by using its sensors as the eyes and ears of the operator.

### Autonomous navigation
This configuration of the robot is used for consistent and auditable operations rounds at hazardous and/or remote sites. The robot is equipped with camera's for visual inspection and microphones for sound monitoring. It automatically navigates itself between and on inspection locations.

### Leak-detection
This configuration equips the robot with a range of leak-detectors for pre-entry safety rounds and enhanced emission control. The robot is equipped with camera's for visual inspection, microphones for sound monitoring and various gas detectors for leak detection. It sends an alarm to the control-room if a leak is detected.

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**Ian Peerless, Operations Director at ExRobotics:**
"*So far, feedback from customers using the ExR-1 gas detection robot with Falco PID has been very good. It has fulfilled the urgent need for a remotely operated VOC monitor in line with the tightening of fugitive emission regulations.*"

"*The key advantages of the Falco PID are flexibility of communication channels, adequate power requirements and importantly, certification. ExRobotics supply the only Ex robot for this kind of application so it was vital the instrument was accredited for use in hazardous zones and atmospheres. Importantly, the Falco is also able to detect those VOCs commonly found in the oil industry and offers high sensitivity to a broad range of gases.*"

"*It is still early days for the ExR-1 gas detection robot as it is an emerging market and an entirely new concept. However, many oil majors currently have them on test making it highly likely we will purchase more ION Science's Falco fixed PIDs going forward. We are also excited about the option of a Falco$^{TAC}$ instrument as benzene monitoring is becoming a bigger and bigger requirement.*"

"*ExRobotics is already recommending the Falco to other oil companies. Our robots are used all over the world so end users can see just how good the instrument is. We are also optimistic that there is likely to be a wider use for the ExR-1 gas detection model across the chemical, mining and energy industries.*"

"*Our relationship with ION Science is very good and we are happy to work alongside them to explore future joint opportunities.*"

## The ION Science Solution

### Instrument: Falco Fixed PID Detector

ION Science's Falco boasts fast response times and several innovative design features. The instrument's 'typhoon technology' prevents condensation forming on the sensor making it ideal for use in high humidity and harsh weather conditions. Simple to operate, Falco has an externally located, intrinsically safe sensor which facilitates quick and easy servicing without the need for a hot work permit.

The Falco PID incorporates ION Science's patented Fence Electrode Technology which virtually eliminates the effects of airborne humidity and protects from contamination. This advanced feature ensures ultimate reliability and accuracy in the field, while reducing drift issues and extending run time. There are eight models in the Falco series offering detection ranges as low as 0 - 10ppm with parts per billion (ppb) sensitivity or as high as 0 – 3000 ppm.

The Falco's flame and explosion proof enclosure is certified to EX d IIC T4 II and the external sensor to EX ib IIC T4 Gb II. A 4 – 20 mA analogue output enables Falco to be easily integrated into a DCS control system to give warning or control of high VOC levels in the working environment. Two relay outputs means it can be connected remotely plus RS485 output with Modbus protocol included as standard allows the instrument to be connected to a network.

The Falco is operated via an intuitive user interface with OLED display and five magnetically activated LED switches – up, down, left, right and enter – which are back lit to help confirm the correct button is being pressed. For added convenience and ease of use, brightly coloured red, amber and optional pulsing green status indicators are clearly visible in sunlight allowing checks to be conducted from a distance of up to 20 metres.

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