



Enhancing Safety and Reducing Operating Costs with the Next Generation of Fixed Gas Detectors

Hosted by the Society of Petroleum Engineers





WE KNOW WHAT'S AT STAKE.

MSA Safety – A Global Leader in Safety

A quick overview of some of the PPE products we manufacture














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A quick overview of some of the FGFD products we manufacture



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Enhancing Safety and Reducing Operating Costs with the Next Generation of Fixed Gas Detectors

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Agenda

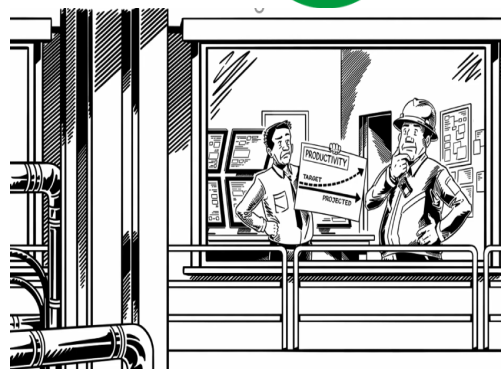
- Common gas detector challenges
- The new advanced sensor technology
- Intuitive interface options
- How to calibrate remote sensors
- Conclusions - How does this benefit you, the user
- Q & A session



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Gas Detection Systems – operational challenges

- **You are being expected to do more with less**
 - Greater output with the same or less manpower
- **Gas detection systems consume resources to ensure 100% availability of all your sensors**
 - Preventative maintenance on a regular basis requires a lot of labour, which is expensive
 - Trained personnel required to inspect / bump test, calibrate, document all the system maintenance activities
- **Consumable components traditionally required to keep system operational**
 - Many toxic gas sensors have a short (12-24 months) operating life, especially in extreme environments
 - High infrastructure costs: store and manage spares / calibration, gas cylinders and their disposal



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Traditional gas detection challenges

REQUIREMENT TO CALIBRATE SENSORS EVERY 90 DAYS

What it means for you?



The cost of maintaining toxic H₂S sensors after 5 years will often be more than the initial detector cost

PRODUCTIVITY LOSS

Every minute spent on your gas detection system is time not spent meeting your organization's operational targets.



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Traditional gas detection challenges

INABILITY TO TELL FOR SURE THAT YOUR DETECTORS WORK

What it means for you?

Offshore gas leak detection study shows that 40% of leaks go undetected.

Offshore Hydrocarbon Release Statistics, HSE UK

CONSEQUENCES

A gas detection system that is not working properly can lead to serious consequences, like costly production shutdowns or undetected gas leaks.



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Traditional gas detection challenges

FREQUENT SENSOR REPLACEMENTS

What it means for you?

Sensor Life

Oxygen  2 years

Toxic  2-3 years

Catalytic Bead  3-4 years

Warranties

 1 year



MAINTENANCE COSTS

Frequently buying sensors that have a short operating life dramatically affects your maintenance costs. The life of a traditional sensor starts from when it is made, so the longer it's in your stores the shorter its operating life.



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Traditional gas detection challenges

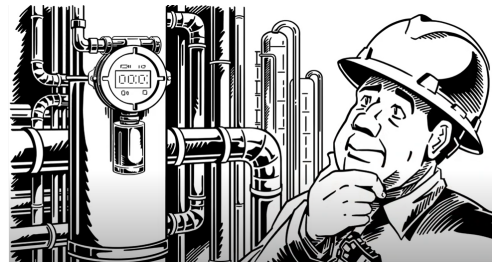
DIFFICULTY IN OPERATION AND MAINTENANCE

What it means for you?

- Need for repetitive training, resulting in technicians not focusing on production activities

CONSEQUENCES

A gas detection system that requires a lot of training and is not intuitive in its use, will become costly and more difficult to maintain.



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What if you...

BI-ANNUAL
CALIBRATIONS CAN
LOWER LABOUR
COSTS BY >75%



- Didn't have to calibrate sensors every quarter and instead could schedule it during an annual or even biannual shutdown?
- Could **guarantee** that your sensors were working between calibrations?
- Could see the transmitter status at a glance and **work without special tools** or training to use the gas detector as the menu was easy to understand?
- Only needed to **replace sensors every 5 years** instead of every 12 to 18 months or maybe 24 months?
- Could cut installation costs on new systems in half by using two sensors connected to a single transmitter?



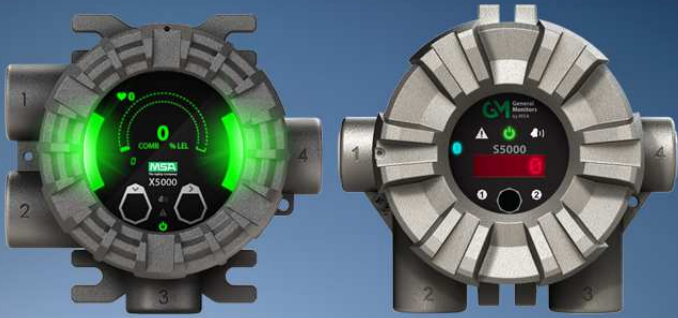
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Advanced sensor technologies from MSA

MSA The Safety Company

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MSA ULTIMA® X5000 & GENERAL MONITORS S5000



XCell
PERMANENT
TruCal™

MSA
The Safety Company

MSA
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Advanced sensor technologies from MSA

EXPECT MORE FROM YOUR SENSOR!



XCell
SENSORS
TruCal®

SafeSwap®



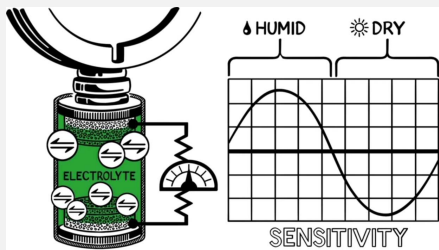
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Advanced sensor technologies from MSA

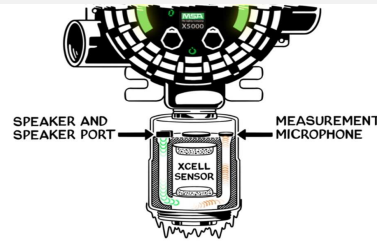
OVERCOMES THE LIMITATIONS OF LEGACY H₂S AND CO DETECTION

TruCal™



Adaptive Environmental Compensation

- Adjusts sensitivity
- Advises if calibration needed
- Advises sensor end of life



Diffusion Supervision

- Checks that gas can reach the sensor
- Monitors sound waves across the inlet
- Warns if sensor inlet is blocked

TruCal - Fail-Safe Sensor Technology.



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Advanced sensor technologies from MSA

TRUCAL TECHNOLOGY FOR H₂S AND CO DETECTION

Adaptive Environmental Compensation (AEC)

Worry-Free Operation



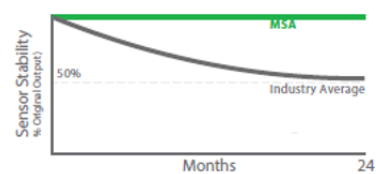
Automatically self-checks 4x/day

Longer Calibration Cycles



MSA Industry Average

Better Stability (Lower Drift)



XCell®
SENSORS

TruCal™



WE KNOW WHAT'S AT STAKE.

Advanced sensor technologies from MSA

- TruCal, the combination of Adaptive Environmental Compensation (AEC) and Diffusion Supervision, can provide you unique benefits
- MSA's advanced gas detection technologies allow you to significantly reduce the cost of ownership of your gas detection system... **Whilst increasing the safety and integrity of the system**



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Advanced sensor technologies from MSA

XCELL ELECTROCHEMICAL SENSOR TECHNOLOGY

All MSA XCell sensors also use a new type of Electrolyte and have a new design of the sensor components.

Features and benefits of XCell sensors

1. Newly developed non-consuming ionic electrolyte
2. All XCell sensors have a longer expected life of 5 years
3. Higher operating temperature of +60°C and down to -40°C
4. Extended sensor warranty of 3 years
5. Can be kept in stock for up to 3 years – recommended to install before the warranty expires

XCell
SENSORS



WARRANTY



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CATALYTIC SENSOR TECHNOLOGY

Beads are 5 times larger than the industry average

1. The unique mechanical support post allows for bigger beads and prevents the platinum wire from breaking
2. Large amounts of surface area for more active sites.

Results in:

- **Better resolution**
- **No drift**
- **Longer lifetime – typically >5 years**



Years of experience in developing catalytic bead sensors



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Ultima® X5000 & S5000 sensor options

INFRARED SENSORS

The X5000 & S5000 can both be fitted to IR sensors

- The IR sensors are the same as the previous models
 - X5000 with XIR Plus sensor
 - S5000 with IR400
- Neither sensor requires a Span calibration. Only a Zero calibration is required and the sensor self calibrates the span.

Temperature Specs:

- S5000 with IR400 range -60 to +75C
- X5000 with XIR+ range -40 to +60C



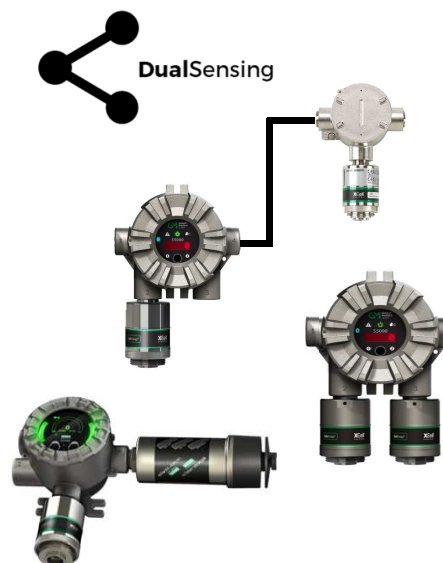
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Dual Sensing Technology

FEWER TRANSMITTERS AND LESS CABLING, LESS CONDUIT

ULTIMA® X5000 and General Monitors S5000 can be connected to 2 sensors at the same time, each with an independent analogue output.

- Any combination of sensors for X5000
- GM S5000 can only have 1 IR sensor and only 1 MOS sensor
- Any sensor can be remotely mounted up to 100 metres away



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SafeSwap Technology

ENABLES SENSOR CHANGES WITHIN A CLASSIFIED AREA

**MSA Patented SafeSwap
used by MSA for >15 Years**

- ✓ No need to power down detector
- ✓ No need for a hot work permit
- ✓ No opening of enclosures
- ✓ No termination of cables
- ✓ Fail-safe warning if sensor not replaced

SafeSwap®



Reduces labour time, down time
and maintenance costs



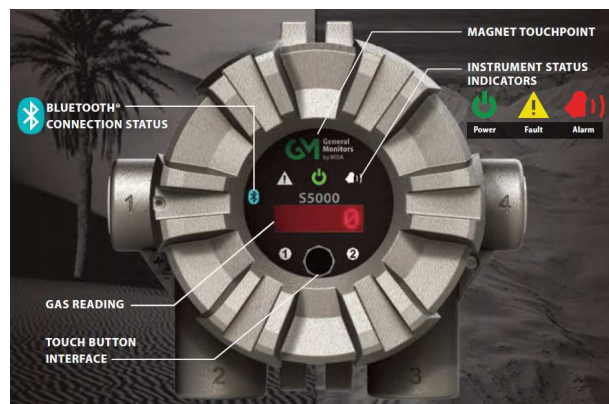
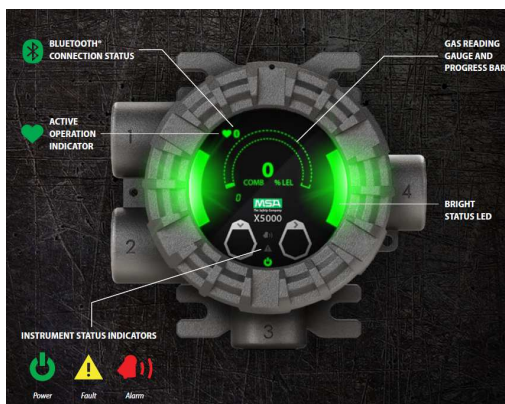
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Gas detection should be easier!

EASY AND INTUITIVE USER INTERFACE OPTIONS

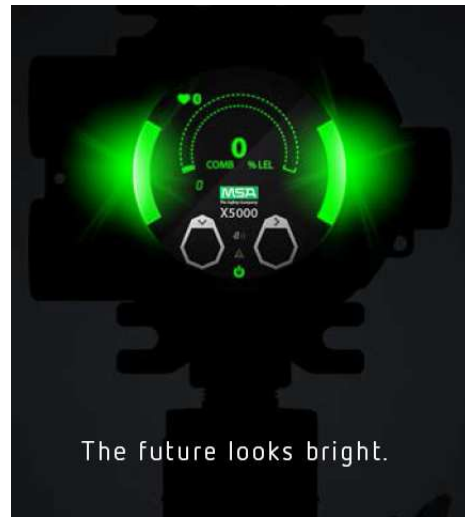


Gas detection should be easier!

THE FUTURE LOOKS BRIGHT

- Highly visible OLED – can be seen from a distance and in sunlight
- Two bright status LED indicators
- Gas reading gauge and progress bar
- Multi-lingual text menu options
- Does not require any tools

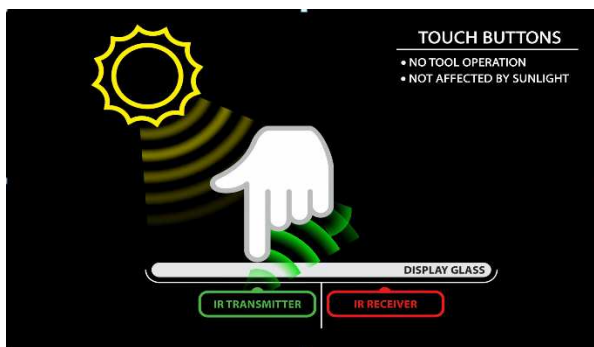
Gives you peace of mind that your gas detector is protecting you, your colleagues and the plant!



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Gas detection should be easier!

NON-INTRUSIVE OLED



- Touch buttons for intuitive menu navigation
- Very bright, full text - easy to read menu



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Gas detection should be easier!

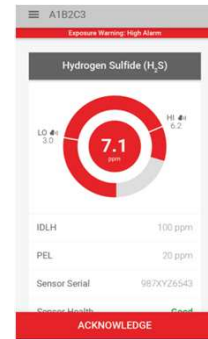
REALTIME DATA IN THE PALM OF YOUR HAND

Improve efficiency with a Bluetooth device and the MSA App



**STAY CONNECTED.
WORK SMARTER.**

- Bluetooth enabled
- Check status and get alerts up to 23m
- Modify settings/set points/alarms
- Initiate calibration and view progress
- Reduce set-up time by at least 50%



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Remote Sensor Calibrations



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CalGard Remote Calibration Adapter

The MSA CalGard RCA for the new XCell Toxic and Catalytic Bead sensors allows the user to perform a **true and accurate calibration** or a simple functional safety test (bump test), from a distance of up to 30 metres.

Suitable for Methane, Propane, Hydrogen, H₂S, CO & O₂.

MSA's unique solution allows the user to perform an accurate calibration. Simple gassing adaptors can be used to apply gas to the sensor, but not for a calibration.



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CalGard Remote Calibration Adapter

Remote calibrations are now possible, as the RCA has an **internal bellows mechanism** – as now shown here by the black rectangle....



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CalGard Remote Calibration Adapter

Remote calibrations are now possible, as the RCA has an **internal bellows mechanism** – as now represented by the black rectangle....

..... and when the calibration gas, which is supplied through the gas supply tubing, reaches the RCA, the pressure forces the bellows up and it **seals around the inlet of the sensor.**



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CalGard Remote Calibration Adapter

The bellows then fills with calibration gas, which cannot be diluted by the ambient air, and then enters the sensor housing, enabling a **successful remote calibration to be performed**

Simple gassing adaptors are used to apply calgas to the sensor, but as the concentration cannot be maintained or controlled, **they cannot be used for accurate calibrations**



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CalGard Remote Calibration Adapter

During normal operation, the gas cloud would pass through the sides of the RCA, reach the sensor and be detected

Diffusion Supervision sensors can be used with the RCA



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CalGard Remote Calibration Adapter

This unique design from MSA allows for **accurate calibrations** and bump tests to be performed, without ever having to gain direct access to the sensor.

Entering pits, tanks etc. and opening HVAC ducts is not required.

This saves a significant amount of time and effort, as well as reducing the manpower involved, as calibrations using the RCA is a **single man operation**.

Once again, MSA are leading the way to solve the difficult problems faced by our customers.



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With MSA you can achieve operational efficiency!

We will help you to improve gas detection performance over time by:



- ✓ Eliminating frequent manual calibrations in your maintenance program and reducing your costs:
 - TruCal, SafeSwap, Dual Sensing technologies, Calgard RCA
- ✓ Extending sensor life providing the lowest cost of ownership:
 - XCell sensors - industry leading lifetime and warranty
- ✓ Giving you the assurance that the detector is working – guaranteed with Fail-Safe H2S and CO sensors!
 - TruCal - self testing and self calibrating technology

SafeSwap®

XCell
SENSORS
TruCal



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