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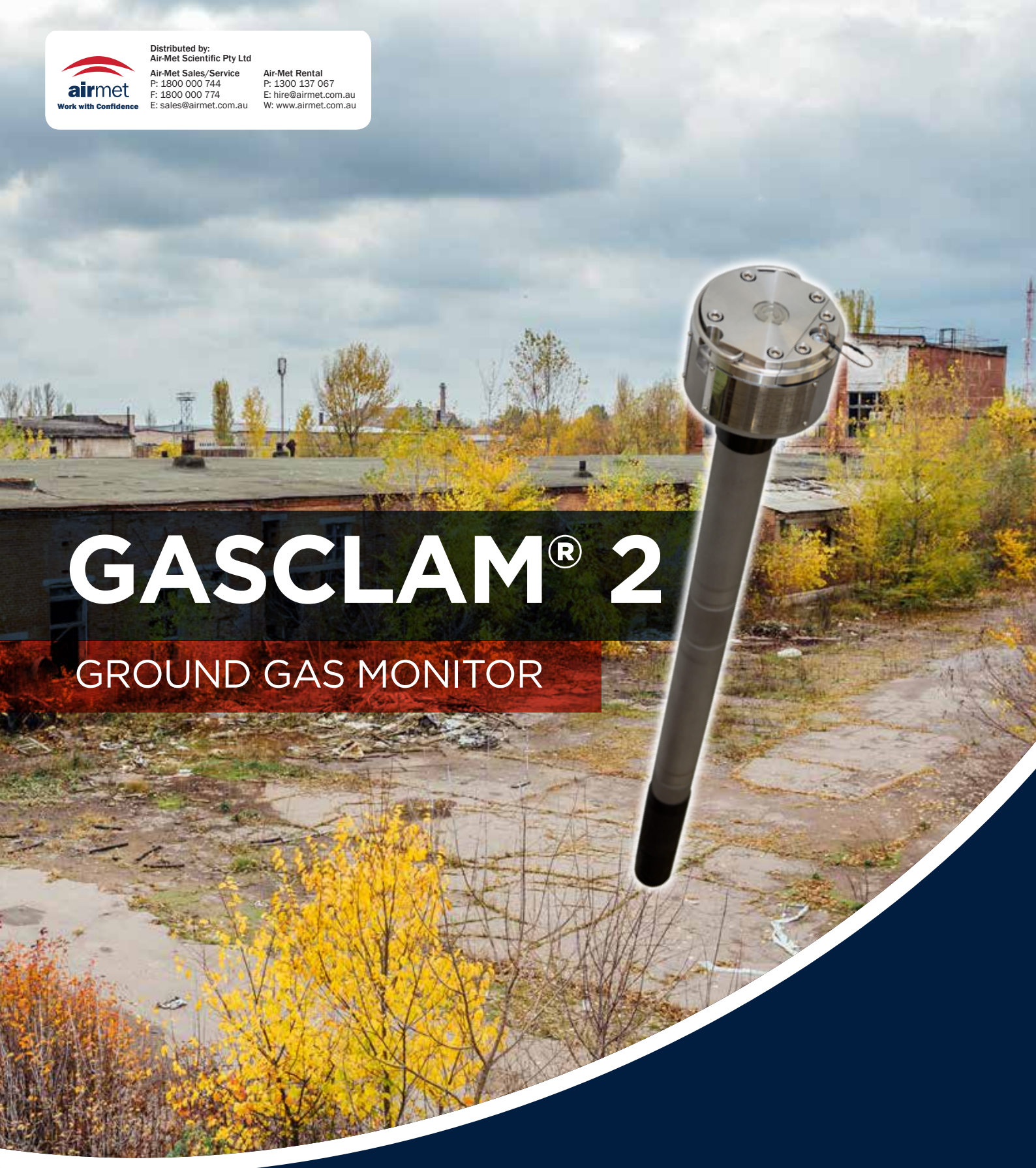


GASCLAM® 2

GROUND GAS MONITOR

THE WORLD'S FIRST CONTINUOUS, BOREHOLE GAS MONITOR.

ionscience.com

Unrivalled Gas Detection.

ION

GASCLAM 2 IS A UNIQUE IN-BOREHOLE GAS MONITORING SYSTEM DEVELOPED FOR UNATTENDED COLLECTION OF LONG-TERM, REAL-TREND GROUND-GAS DATA.

Key Features

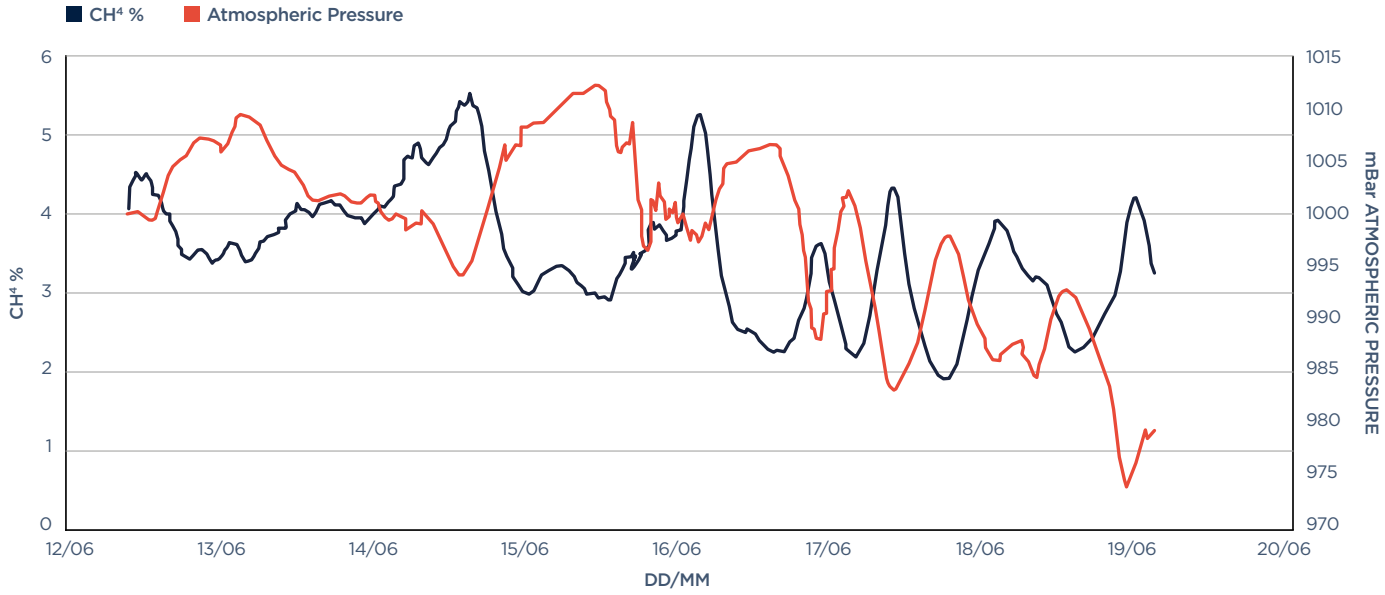
- Continuous gas (methane, carbon dioxide, oxygen, hydrogen sulphide and VOC) monitoring with configurable logging intervals.
- Continuous atmospheric borehole pressure and monitoring with configurable logging intervals.
- Battery powered deployment for over 3 months (dependant on logging frequency)
- External power option for extended deployments.
- Intrinsically safe for use in explosive atmospheres.
- Discrete installation.

Key Benefits

- Optimised site management with insights from continuous monitoring.
- Improved site characterisation and event flagging helps reduce risks.
- Demonstrates regulatory compliance and due diligence.
- Supports an industry recognised best practice approach to ground-gas monitoring.
- Aids selection of cost effective solutions

Ease of Use

- Fits in to standard 50 mm/2” borehole
- Reduces number of site visits
- Simple PC software to download and analyse data.



Continuous ground gas monitoring

Using spot measurements to understand ground-gas behaviours can lead to uncertain or misleading results. Uncertainty exists as concentration changes over time and spot sampling only provides a snap shot of the ground gas at that instant.

Considerable published material from experts who measure ground-gas and perform risk assessments, question whether traditional methods of collecting data are adequate. The need for greater granularity of data was the reason for developing the patented GasClam 2.

GasClam 2 continuously measures and collects ground gas concentration data as well as parameters that are known to control it - subsurface pressure, and atmospheric pressure.

In combination, this data reduces uncertainty by providing the full picture of what is happening below ground. Also by observing the process controlling the ground gas regime you can predict how it will change in the future.
Using GasClam 2, therefore, provides multiple financial benefits. The first saving comes from reducing the number of site visits by a field engineer.
The second saving comes from reducing the overall length of monitoring programmes as legislative data requirements can be met quicker.
The third, and largest saving, is made by designing appropriate, rather than over engineered solutions based on complete and robust data.

Applications include

- Brownfield site investigation
- Landfill perimeter monitoring and control
- Shale and Coal Bed Methane/ Seam Gas site monitoring
- Vapour intrusion studies
- Waste Management
- Refineries and petroleum storage monitoring

Accessories

- External power supply cable
- External power supply / communication adaptor
- External level sensor

Technical specifications

GAS	METHOD/TYPE	RANGE	RESOLUTION	ACCURACY
CO_2	Infrared	0-100%	1% above 50% 0.5% below 50%	+/- 2% FSD
CO_2	Infrared	0-5%	-	-
CH_4	Infrared	0-100%	1% above 50% 0.5% below 50%	+/- 2% FSD
CH_4		0-5%	-	-
O_2	Electrochemical	0-25%	0.1 %	+/- 5% of reading +/- 1 digit
CO*	Electrochemical	0-2000 ppm	1 ppm	<+/- 3 ppm at 0 +/- 5% at 250 ppm +/- 10% full scale
H_2S*	Electrochemical	0-100 ppm	1 ppm	+/- 1 ppm at 0 +/- 2% at 100 ppm
VOC*	PID	0-4000 ppm	1 ppm	+/-5% of reading +/- 1 digit
DUAL CO/H2S				
CO	Electrochemical	0-500 ppm	1 ppm	<+/- 3 ppm at 0 +/- 3% at 250 ppm
H2S	Electrochemical	0-200ppm	1ppm	<+/- 1ppm at 0 +/- 2.% at 100 ppm

ENVIRONMENTAL	METHOD/TYPE	RANGE	RESOLUTION
Barometric Pressure	Piezoelectric	800 to 1250 mBar	1 mBar
Borehole Pressure	Piezoelectric	800 to 1250 mBar	1 mBar
Temperature	Internal Chip	-5°C to +50°C or 22°F to 122°F	0.1°C or 1°F
Water depth*	Piezoelectric	0-25m (Various available)	0.01 m

POWER OPTIONS	**Internal:** Option of Lithium primary cells or Duracell Alkaline D-Cells or Rechargeable battery pack **External:** Accepts intrinsically safe external power supply for extended and/or rapid monitoring	
Typical Battery Life (hourly sampling)	Lithium primary cells Alkaline cells Rechargeable battery pack	3 months 1 month 3 weeks
Case	High quality stainless steel	
Weight	7.5 kg (16.8 lbs)	
Dimensions	**Overall length:** 90cm (35.4 in) — Borehole tube length: 83cm (32.6 in) **Head diameter:** 11cm (4.3 in) — Borehole tube diameter: 4.7cm (1.85 in)	
Protection	IP68 rated (continuous submersion)	
Operation Temp.	-20°C to +50°C (-4°F to 122°F)	
Approvals	EMC, ATEX 0105 X CE Ex II 2G Ex d ib [ib] IIB T4 IECEx Ex d ib [ib] IIB T4 Gb CSA C (US & Canadian approvals) Class 1, Zone 1 (A)Ex d id IIB T4 (Certifcation Pending: Due Jan 2019)	
Patents	European and World-wide Patented	

GasClam 2 V1.0. This publication is not intended to form the basis of a contract and specifications can change without notice.

European patent granted / Worldwide patent granted.
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GasClam 2® is a registered trademark of Intelisys Ltd T/A Salamander Group.

* Optional; ** Choice of 2 IR sensors, specify on order.

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