HONEYWELL | ADVANCED AMMONIA MONITORING TECHNOLOGY

Honeywell

Honeywell | THE FUTURE IS WHAT WE MAKE IT

Honeywell is delivering the future of automation, air travel, and energy with our industry-leading, software-enabled solutions. We create shareholder value through profitable growth and strategic, high-return capital deployment.

$37B
2023 Sales

14%
2023 FCF Margin*

14
Dividend Increases Since 2010

$9.16
2023 Adj. EPS

95,000
2023 Employees

196%
10-Year Total Shareowner Return

SOLVING THE WORLD'S TOUGHEST CHALLENGES IN...

AUTOMATION

AVIATION

ENERGY TRANSITION

**Free Cash Flow Margin for 2023 excludes impact of settlements signed in 4Q22.*

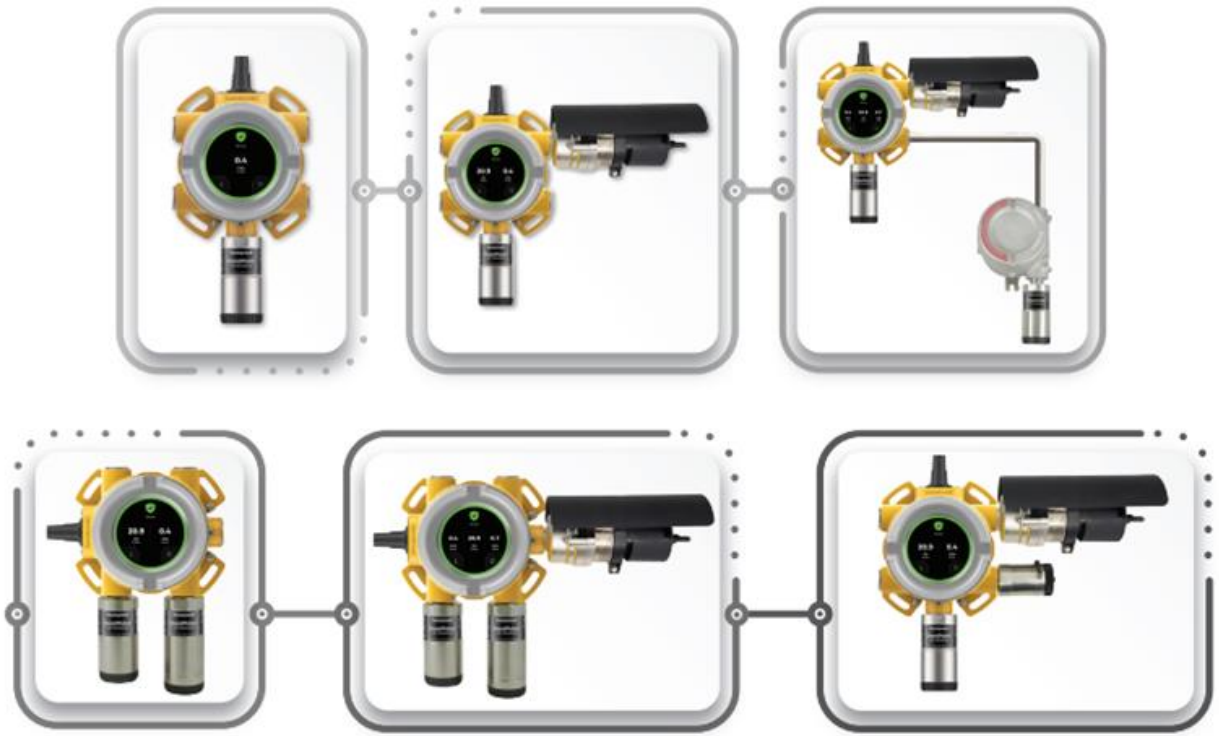
UNDERPINNED BY DIGITALIZATION

A WIDE RANGE OF TECHNIQUES ARE AVAILABLE FOR DETECTION OF HAZARDOUS AMMONIA RELEASES

Detection Technique	Advantages	Limitations
Electrochemical	• 2 – 3 year sensor life • Low limit of detection • Low power demand • Highly selective	• Not failsafe (does not inform operator when it cannot detect gas) • Affected by oxygen levels, poisons, and interferents • Reduced sensor life in hot and dry conditions
Catalytic	• Rugged, suitable for harsh environments • Simple calibration and maintenance • Wide operational temperature range	• Not failsafe • Affected by oxygen levels, poisons, and interferents • Shortened sensor life on continuous or high exposure to background gas
Photoionization	• Fast response	• Non-specific, best use requires knowing the type of background gases that may be present • Affected by high humidity • Lamp requires frequent cleaning
Laser gas detection	• High specificity • Fast response • Wide concentration scale • Failsafe • Unaffected by oxygen levels, poisons, and interferents	• Heavy dust, fog, or steam can block beam • Solid objects block beam path • Only one analyte per instrument
Ultrasonic gas leak detection	• Fast response • Unaffected by ventilation rates • Failsafe • Requires no calibration	• Responds to the sound produced by escaping gas rather than the gas itself • Non-specific • Suitable for pressurize releases (> 10 bar)

POINT DETECTORS OFFER CONFIGURATIONS THAT REDUCE FOOTPRINT AND WIRING COSTS

Single Ammonia Sensor

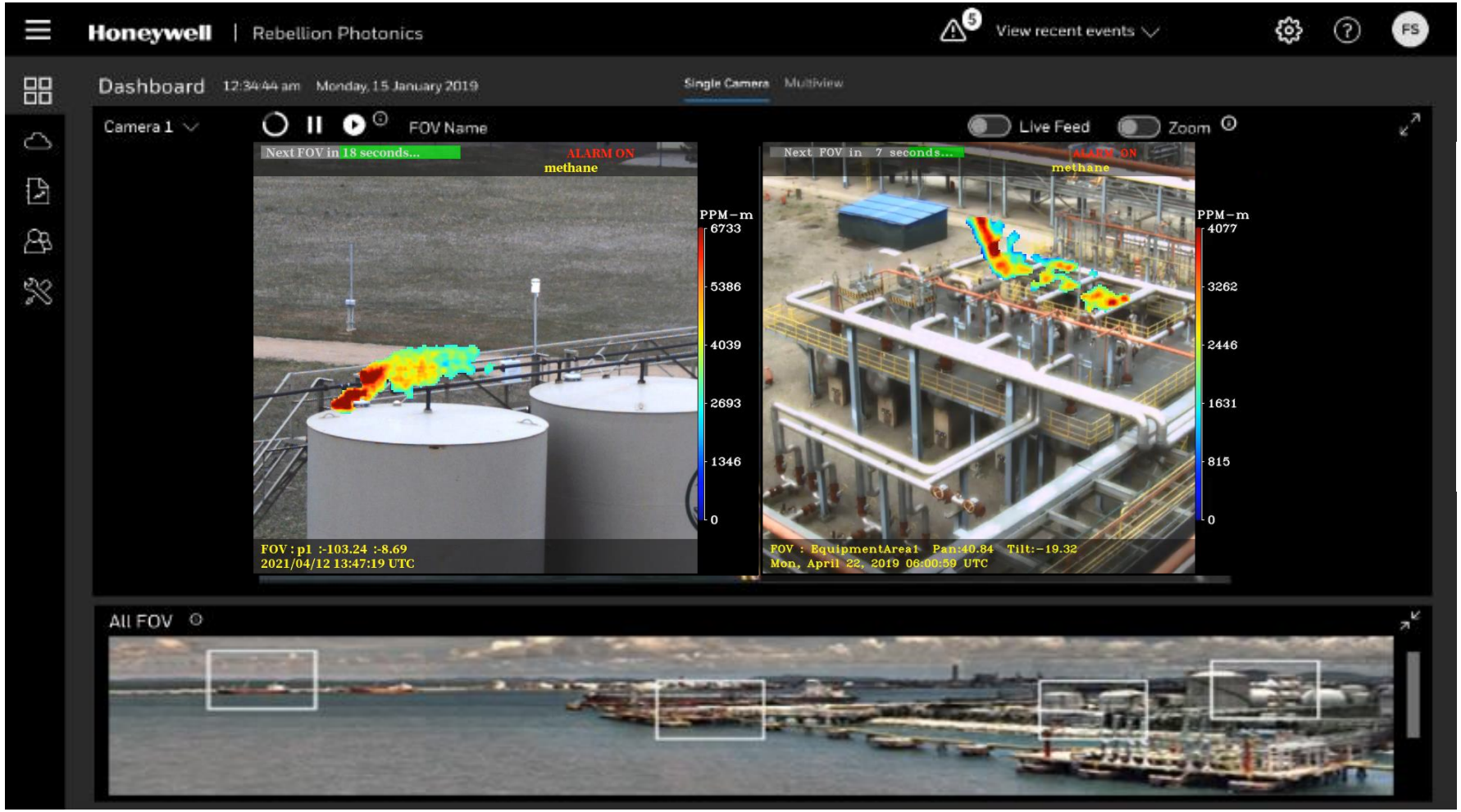


Multi-sensor Configurations Reduce Wiring Costs by $5,500 - $7,500 per Device

REBELLION | CONTINUOUS VISUAL EMISSIONS MONITORING

CH4 Emission Event at Tank Battery

- Rebellion capturing a storage tank emission during METEC study in Colorado.
- The leak source, size and direction is detected for the operator to diagnose remotely via the live dashboard



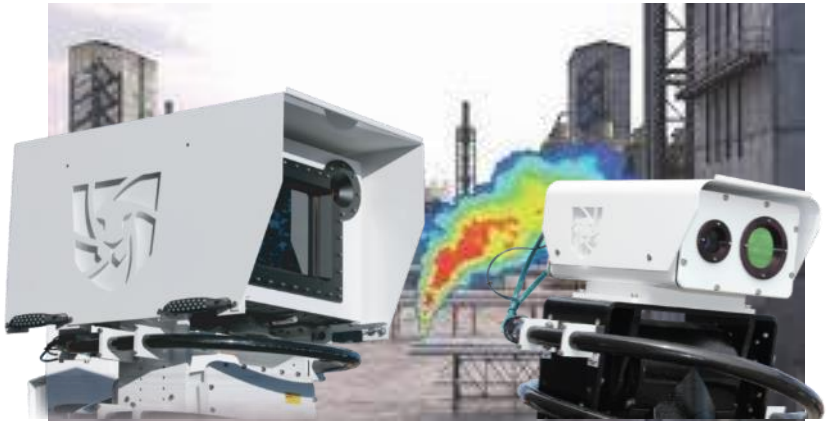
H2S+CH4 Emission During Routine Maintenance

- Rebellion capturing an emission during routine maintenance
- Point sensors did not detect the large gas plume rising over workers on site due to their inherent limitations with rising gas plumes

Identify Problems Operators Don't Even Know Exist

REBELLION | OFFERING OVERVIEW

HARDWARE

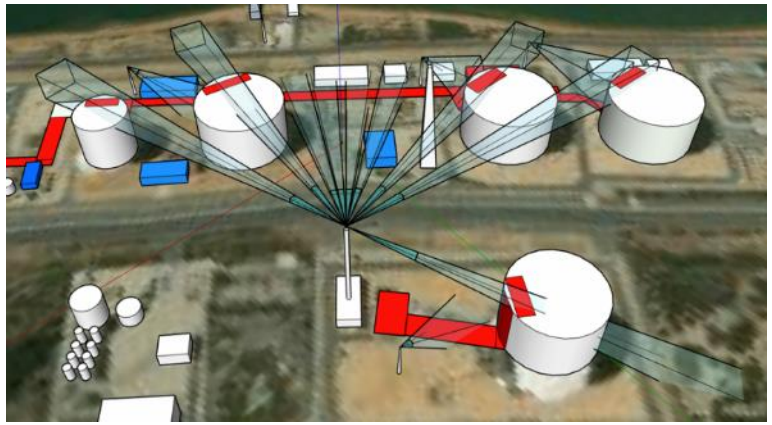


Two model options based on end use requirements with patented Hyperspectral Gas Cloud Imaging (Long Range or Mini)

SOFTWARE

Video Alarm Management Software (Spectra) with Physics enhanced Artificial Intelligence based analytics (40+ gases)

SERVICES

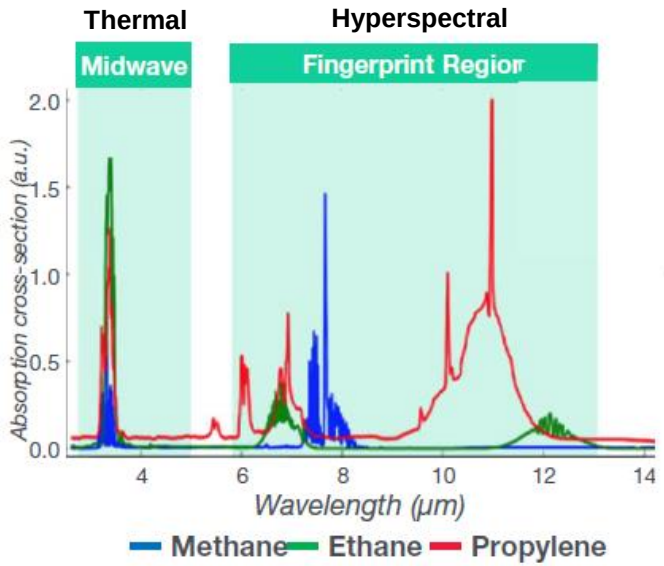


Site Survey, Installation & Commissioning, Repair in Field, Maintenance, Training, Software Upgrades, Performance Tuning & Optimization

Rebellion Provides A Complete Solution To Solving Customer Problems

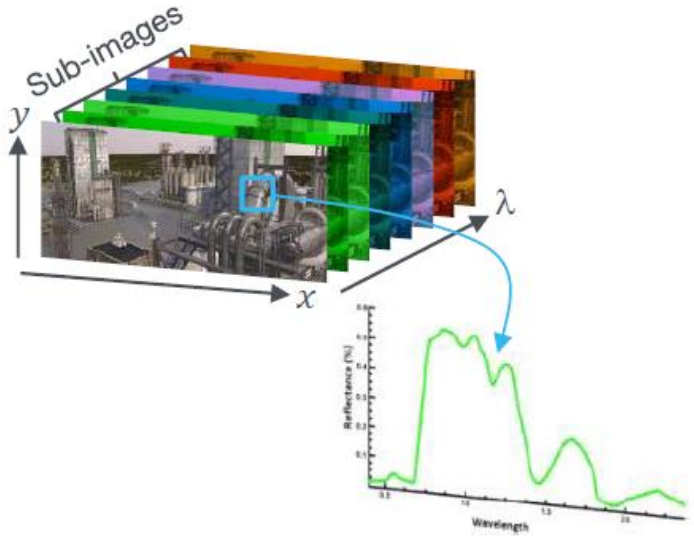
REBELLION | PHYSICS OF THE GCI SYSTEM

GAS FINGERPRINT IDENTIFICATION



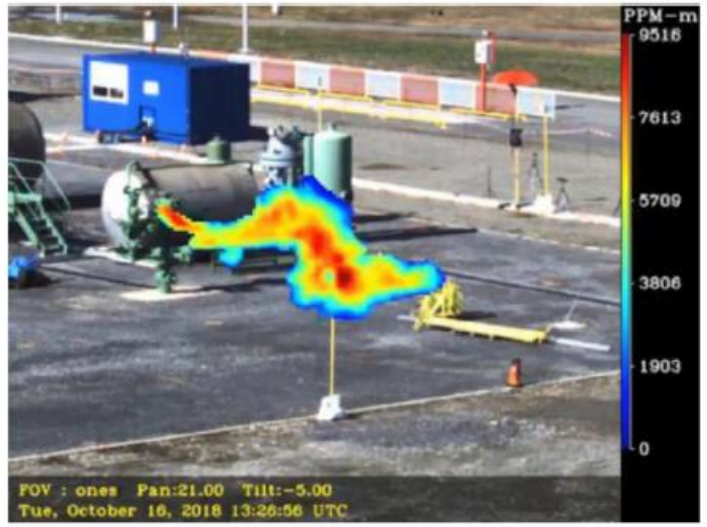
Rebellion utilizes the **fingerprint region** to identify gases and **minimize false alarms** unlike conventional thermal imaging cameras which cannot identify gas signatures

HYPERSPECTRAL ACCURACY



Full snapshot **hyperspectral data continuously collected** for each pixel in field of view for **greater accuracy**

PROPORIETRY ALGORITHMS



Proprietary algorithms convert hyperspectral data to a visual gas cloud display and then overlay on a **live video feed** for **remote diagnosis**

Proprietary Hyperspectral Technology Enables Continuous Monitoring

REBELLION | GAS LIST

Supported Analytics		
Acetone**	Ethylene	N-Butane
Acetylene*	Ethylene Oxide	Propane
Acrylonitrile*	Iso-butane*	Propylene
Ammonia	Isobutylene	Propylene Oxide
Butadiene	Methane	Sulfur Hexaflouride
Difluoroethane(1.1)**	Methanol	Toluene
Ethane	Natural Gas	Xylene*

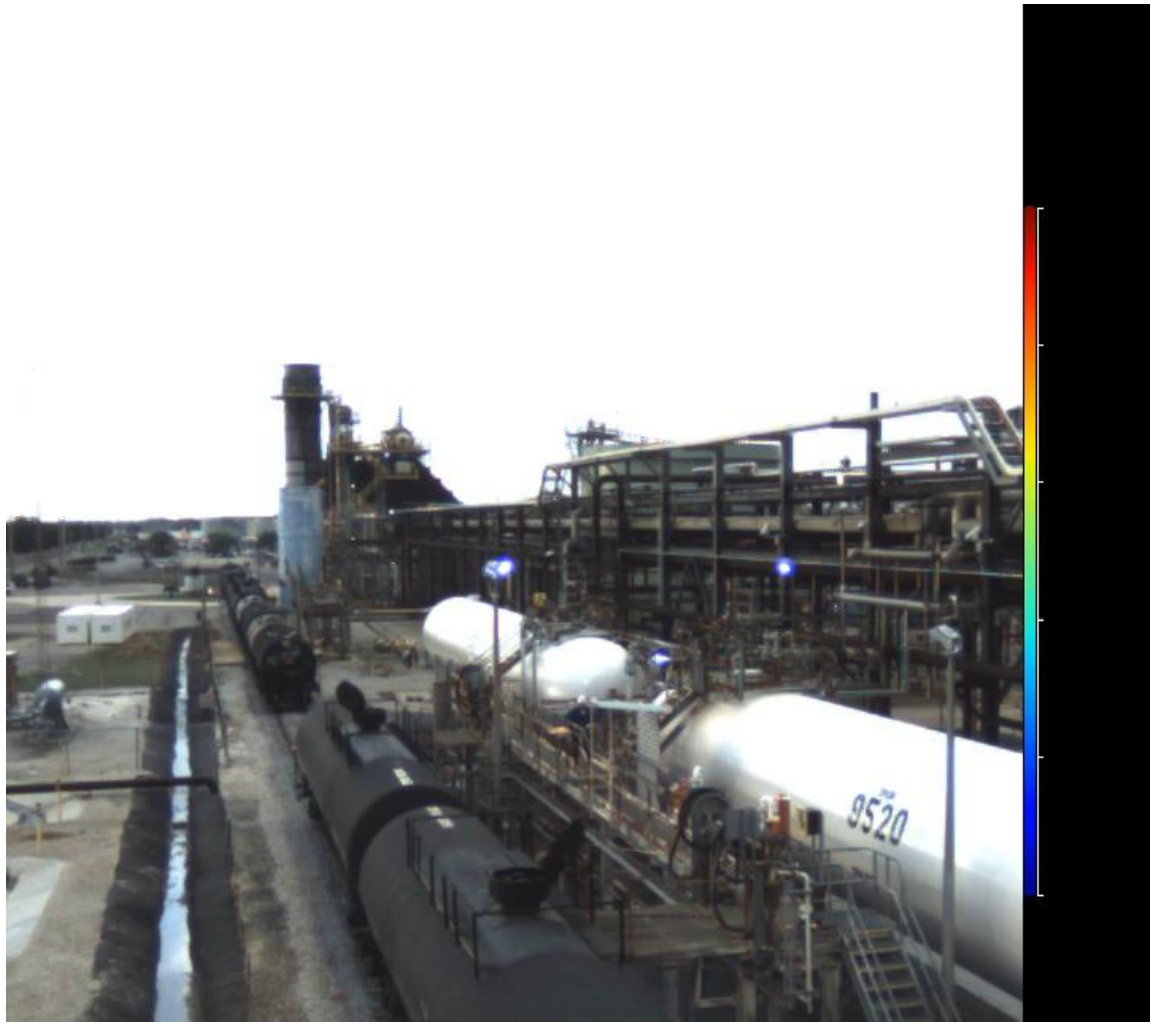
Gases not detectable: H2, HF, F2, and Cl2

Notes:
(1) Standard analytics are developed for pure gas components. Please consult with Honeywell technical advisors if trying to detect a mixture of gases.
(2) If desired gas is not listed above, custom analytics are available
(3) Up to 7 analytics can run on a single GCI or Mini GCI system

*Standard GCI system only
**Mini GCI system only

Standard Gases in the Rebellion GCI Solutions Library

USE CASE - MONITORING LOADING & UNLOADING RAIL CARS FOR AMMONIA LEAKS



- **Installed and commissioned 3 mini-GCI systems to monitor rail car loading area for ammonia leaks**
- **Acting as a supplement to existing open-path monitors**
- **After installation system found leaks not detected by another other technology**
- **Video and real-time tracking are important features for root cause analysis**

THANK YOU

Honeywell