

Effective Hydrogen Gas Detection



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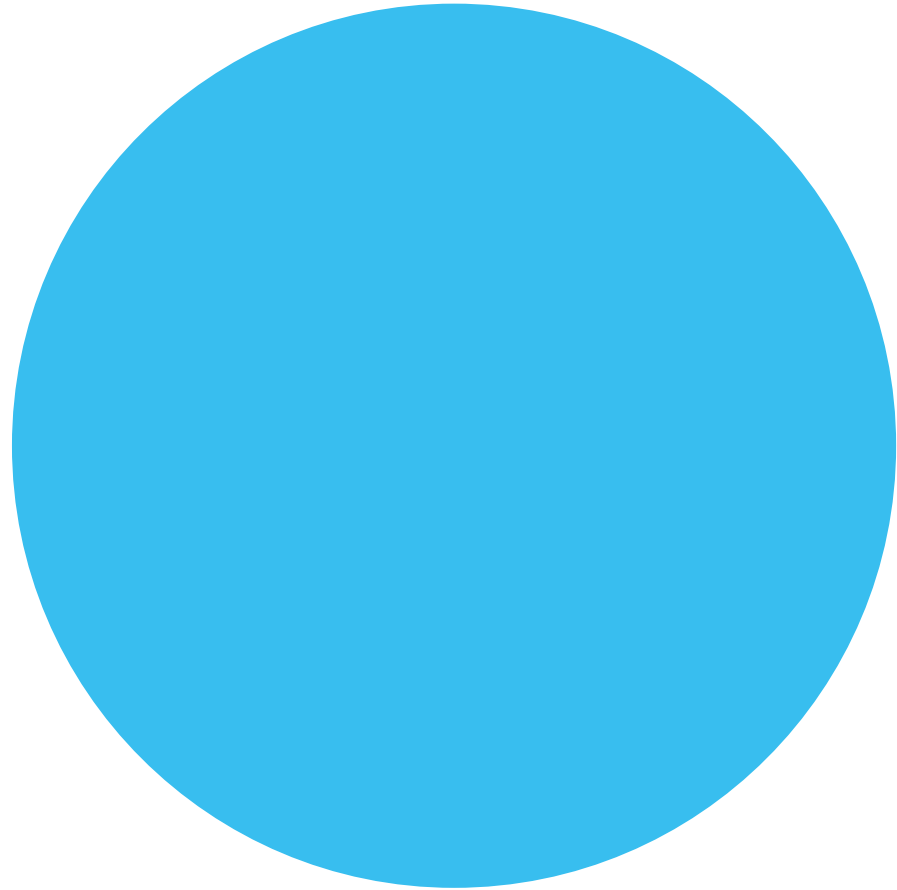




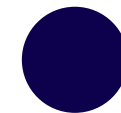
Hydrogen: The world's smallest molecule



- 1/8th size of Methane
- Incredibly prone to leaking



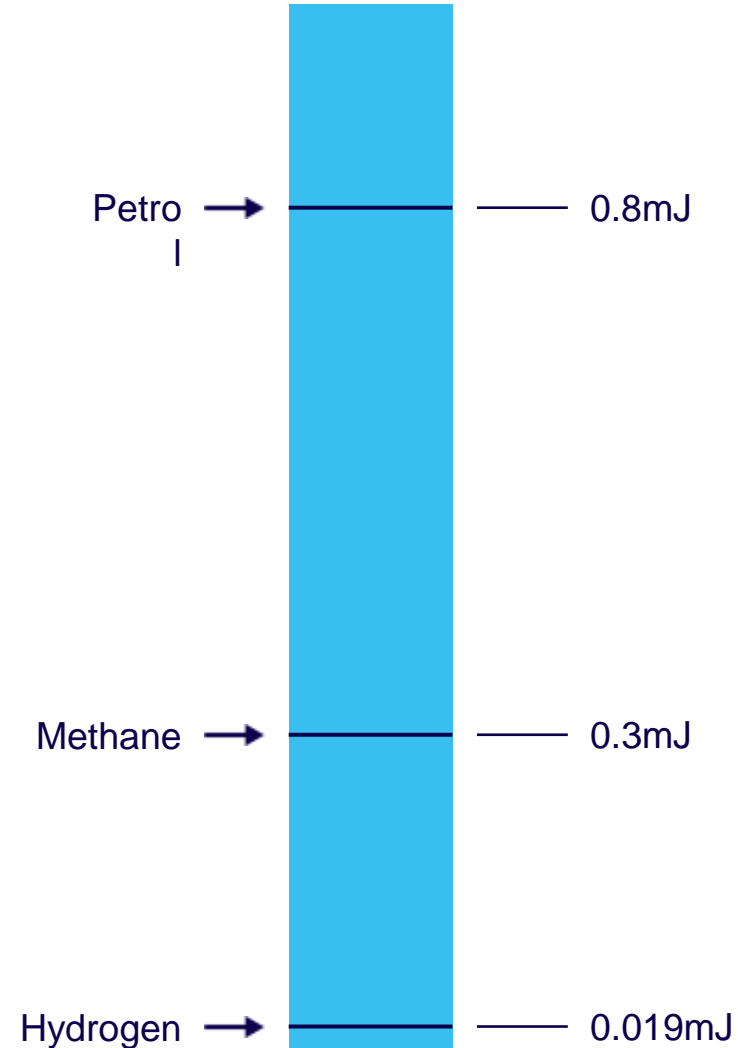
Methane



Hydrogen

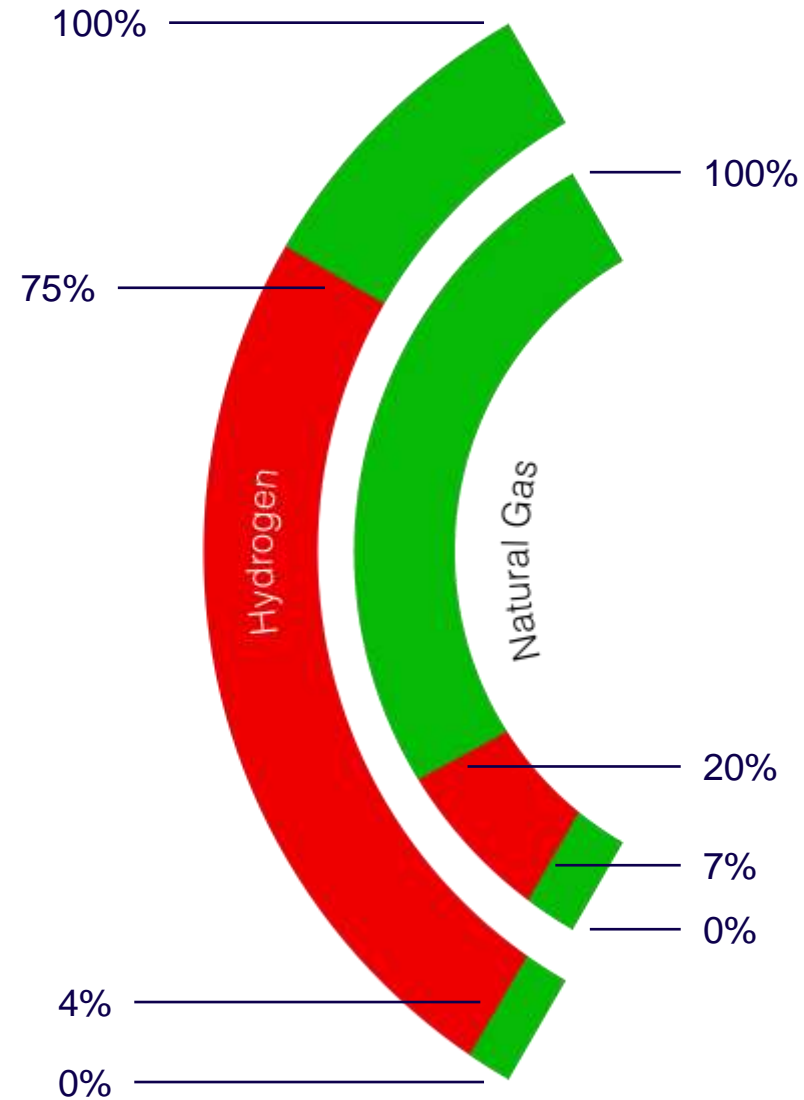
Hydrogen: Ignition Range

- Hydrogen requires very little energy to ignite
- About 0.02 millijoules.
- A small static spark, friction, or even heat from a hot surface can be enough to trigger combustion.



Hydrogen: Flammability Range

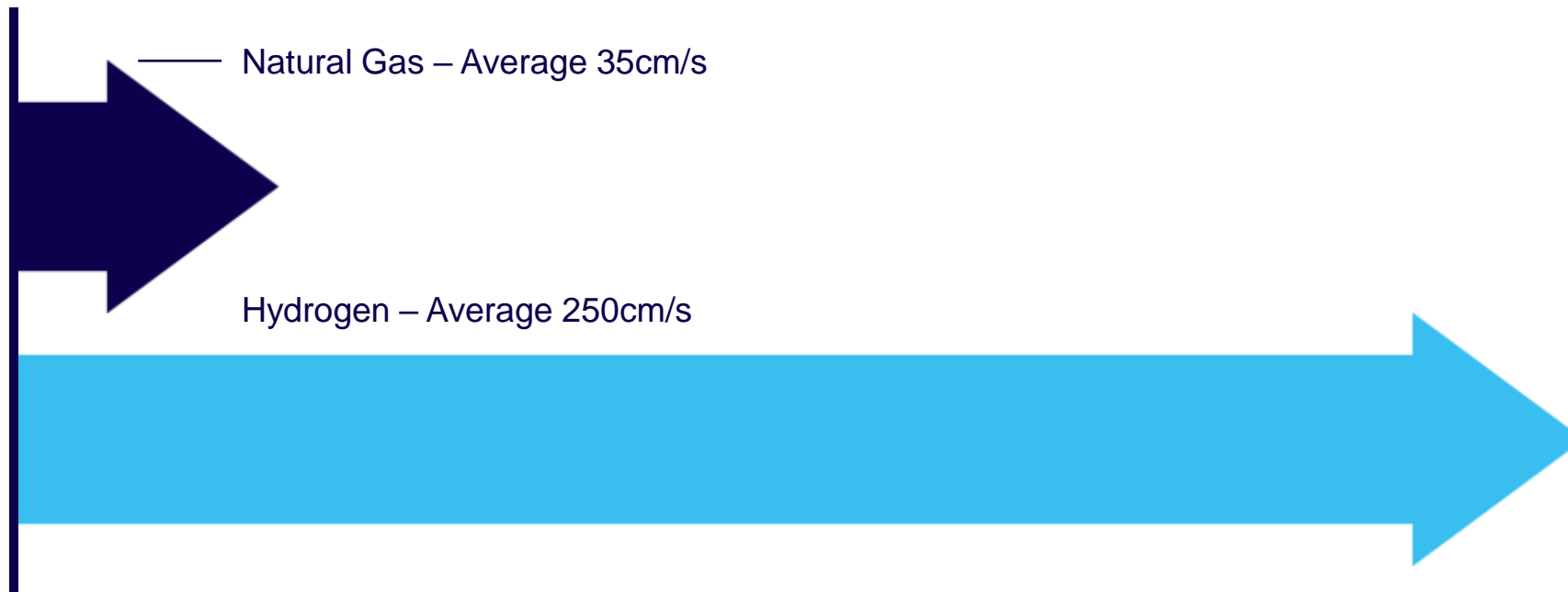
- One of the broadest flammability ranges of any gas
- Between 4% and 75% by volume in air
- It can ignite at concentrations much lower or higher than many other combustible gases.



Hydrogen: Flame Speed



- Travels roughly 7 times faster than Methane making ignitions 7 times the violence.
- The high flame speed is due to hydrogen's small molecular size, low activation energy, and rapid diffusion rates





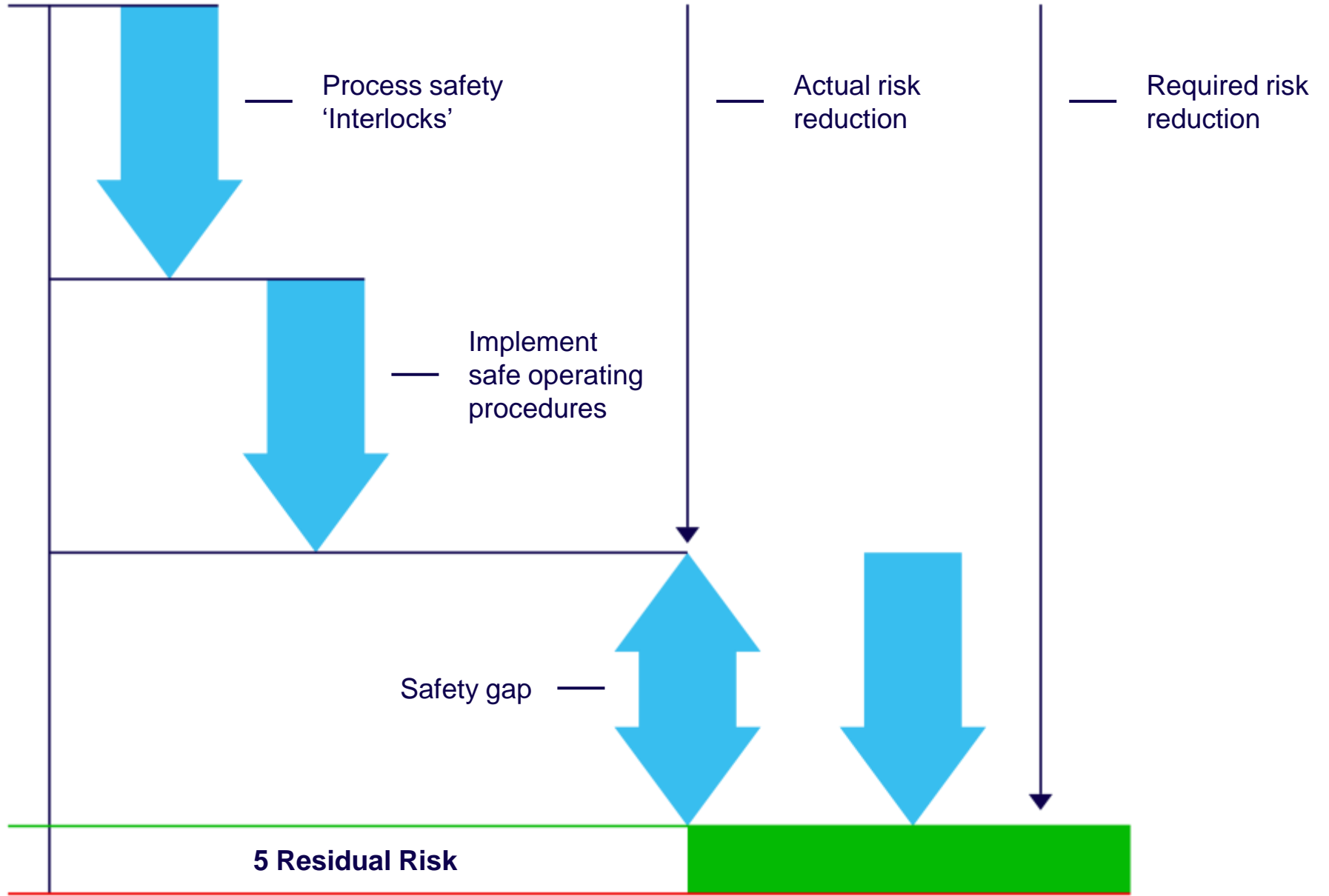
Risk Assessment



- Can we eliminate hazardous materials?
- Can we limit the potential for human error?
- Can we automate processes?
- Assess the remaining safety gap before prescribing an appropriate gas detection solution



Complete risk with no actions taken to reduce risk



Acceptable risk level

Remove risk altogether

What if?

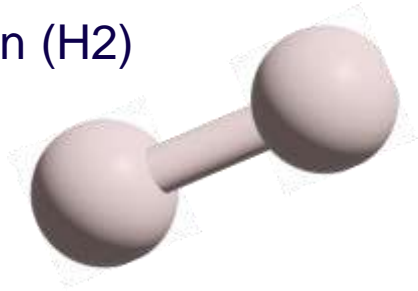
- General wear and tear
- Hydrogen embrittlement
- Lapses in concentration



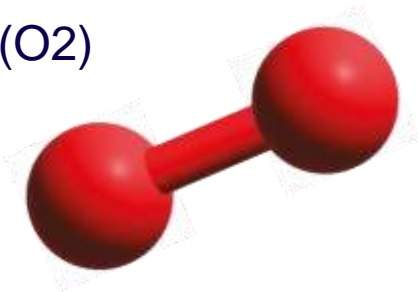


Water Electrolysis

Hydrogen (H₂)

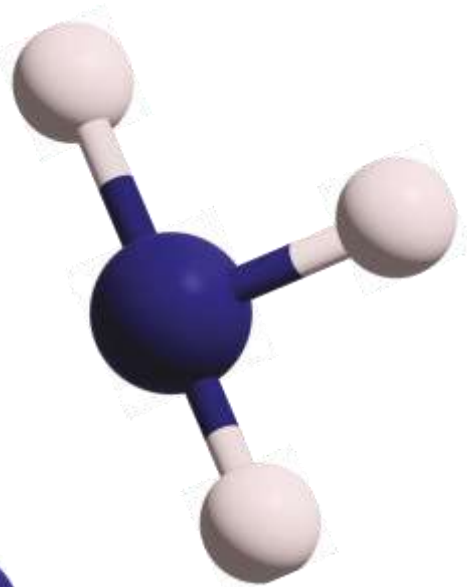


Oxygen (O₂)

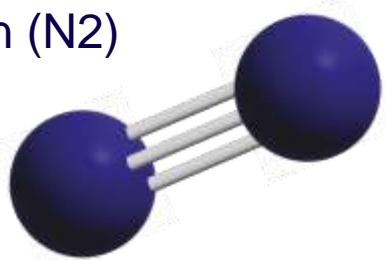


Transport and Storage

Ammonia
(NH₃)



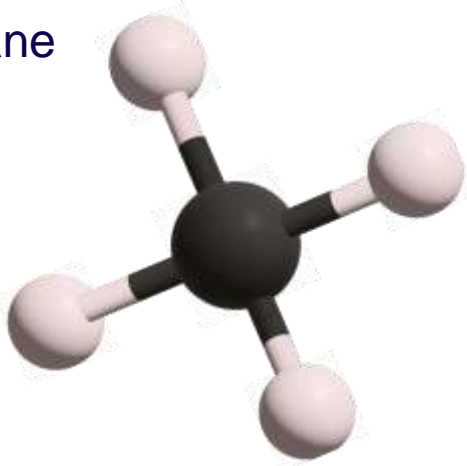
Nitrogen (N₂)



Steam Reforming



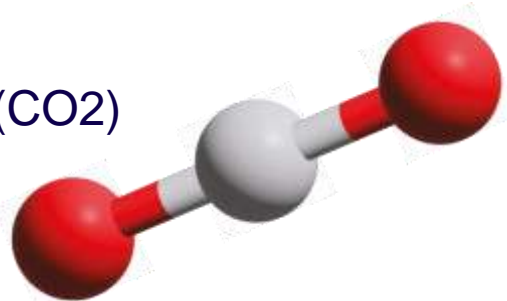
Methane
(CH₄)



Carbon Monoxide (CO)



Carbon Dioxide (CO₂)





There is no
magic bullet.



Gas Detection Facts

- There is no such thing as a one-size-fits-all sensor
- They all have their own strengths and weaknesses
- There are no sensors with an infinite operational life
- No one has been developing gas detection technology longer than IGD

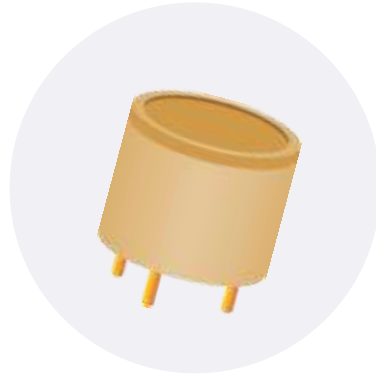


A century of innovation





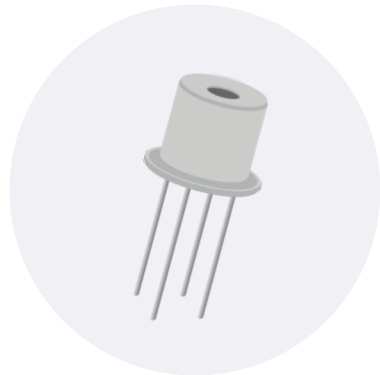
Pellistor
Flammable Gases



Infrared
Toxics, Flammables
& Refrigerants



Electrochemical
Toxics & Flammables



Semiconductor
CFCs & HFCs



Ionic Ammonia
(Electrochemical)
Ammonia Gas

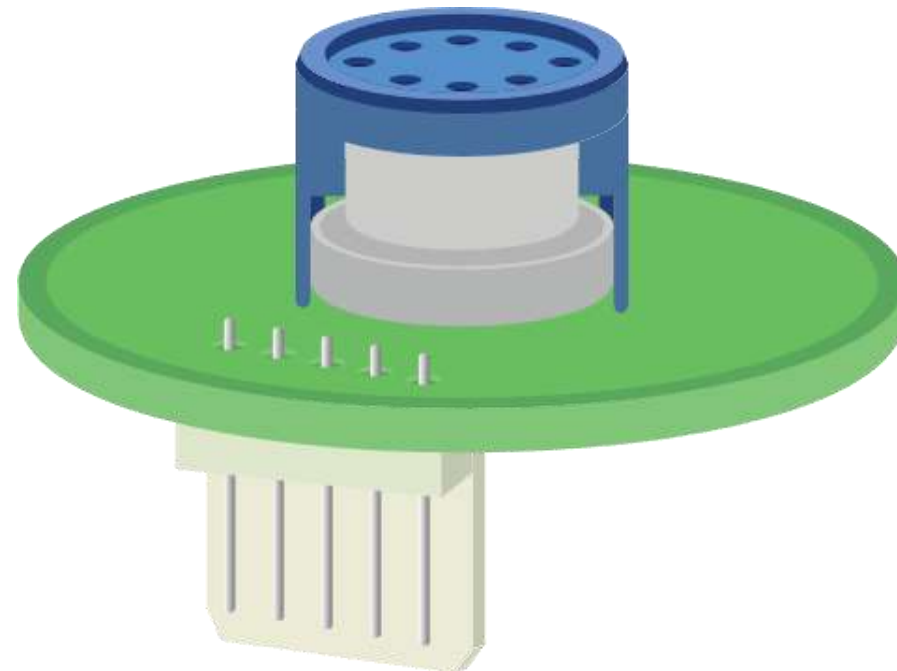


Long-Life Oxygen
(Electrochemical)
Oxygen

Sensor Technology: MK8 Pellistor



- The industry's most poison-resistant sensor
- Perfect for harsh environments
- Low-level %LEL Detection
- Industry-leading operational lifetime



Sensor Technology: Electrochemical



- High Sensitivity and Selectivity
- Suitable for a wide range of gases
- Low-level ppm detection
- Energy Efficiency



Sensor Technology: Thermal Conductivity



- Adept at monitoring binary gas mixtures
- Struggle with complex atmospheres
- Highly sensitive
- Susceptible to environmental factors



Sensor Technology: Semiconductor



- Low maintenance and incredible durability
- Wide gas detection capabilities
- Fast Response times
- Often the best option for portable detection



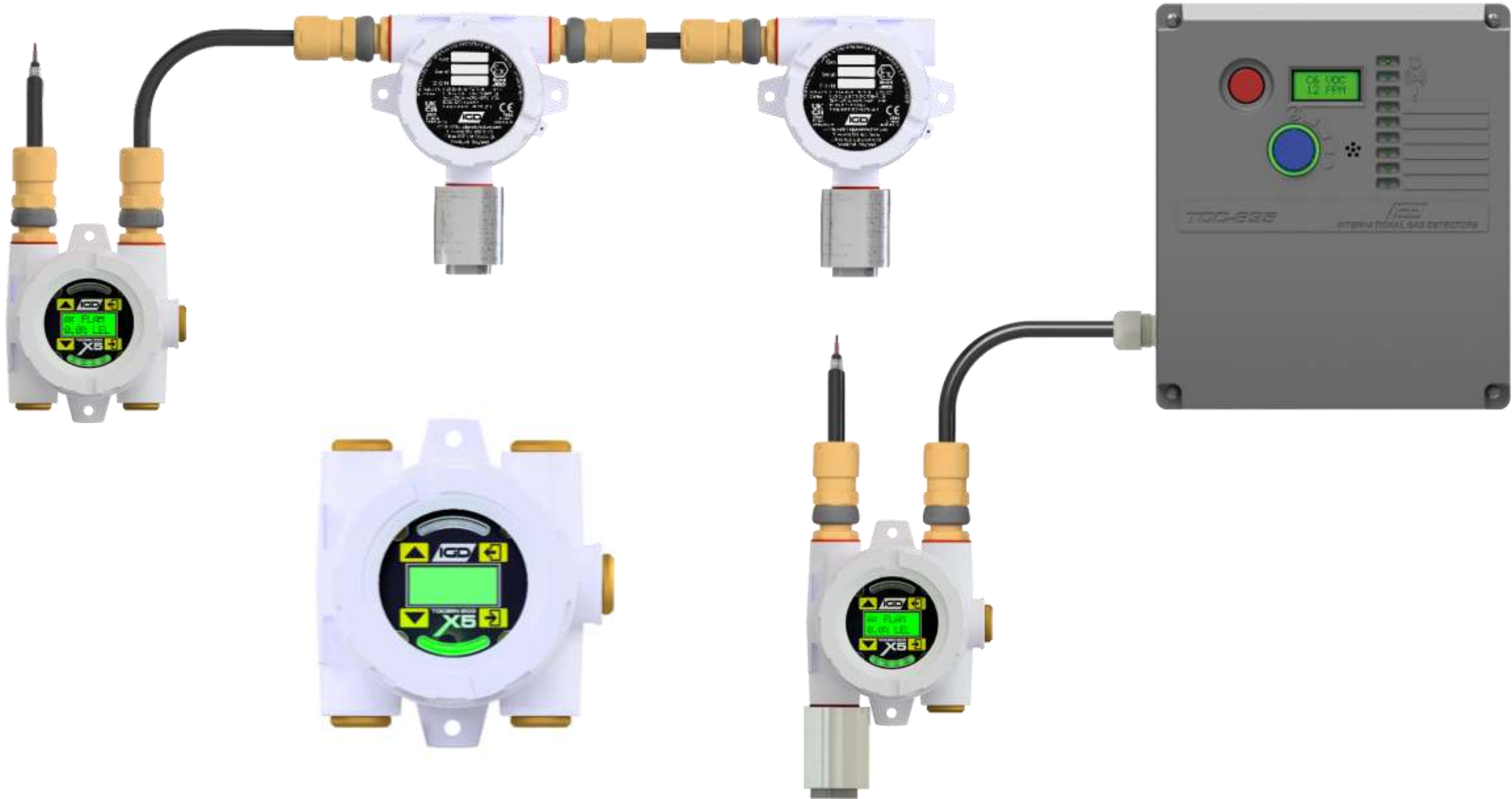


TOC-903-X5



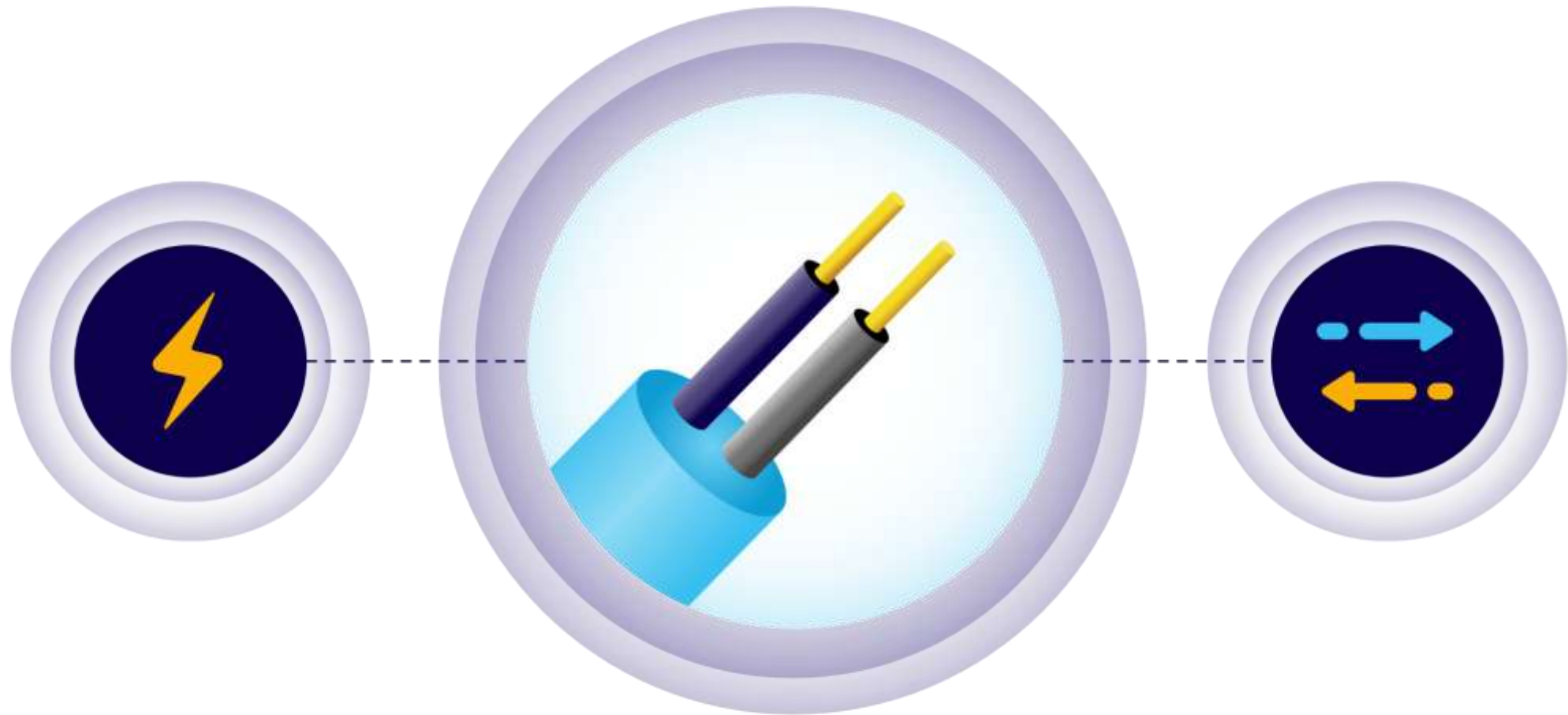
- The World's Most Versatile Gas Detector
- Simultaneous Dual-Gas Detection
- One-man non-intrusive calibration
- Intuitive 3-way colour change display
- ATEX-rated
- Standalone controller functionality



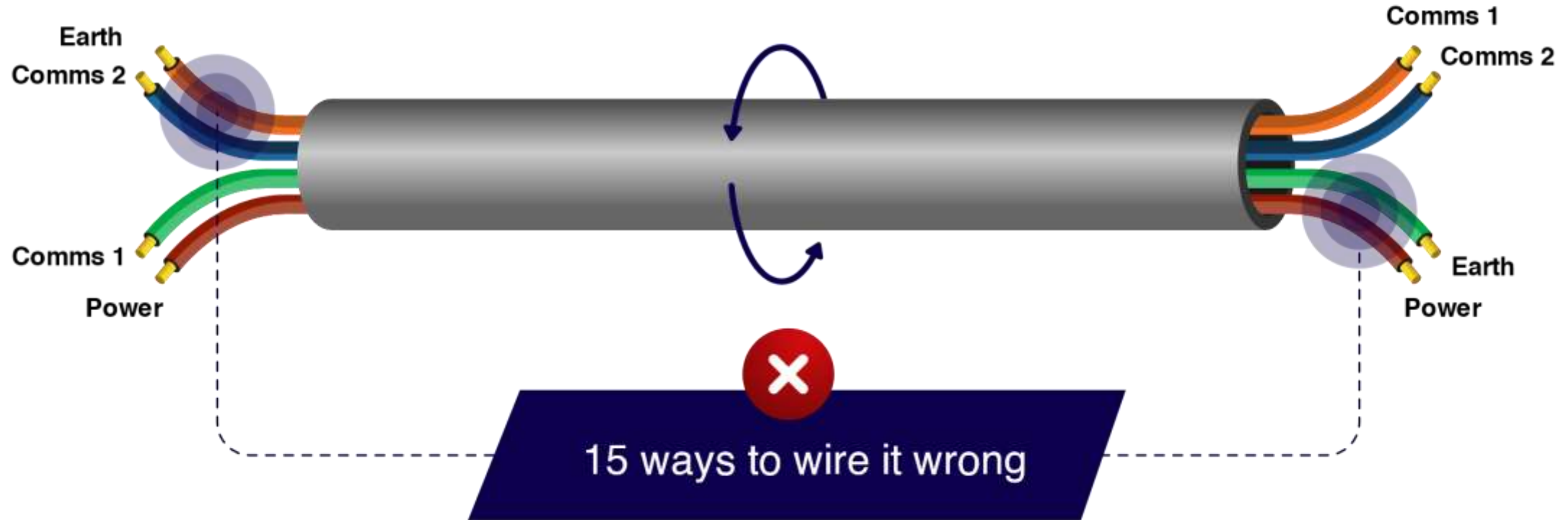




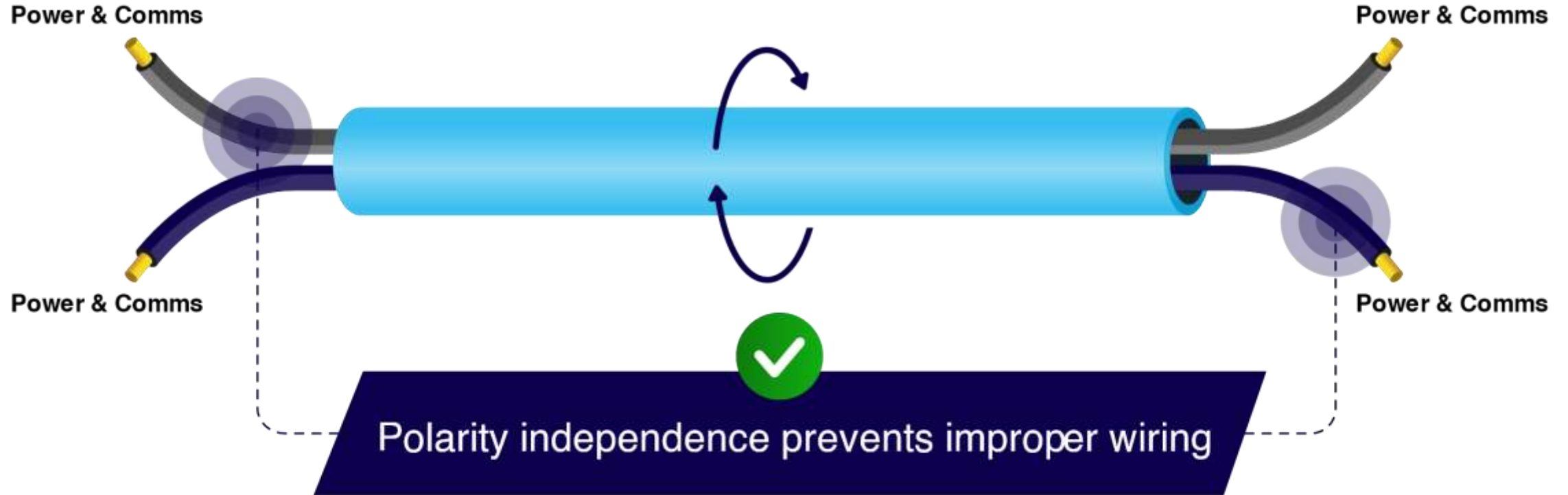
2-Wire Addressable: The future of gas detection now

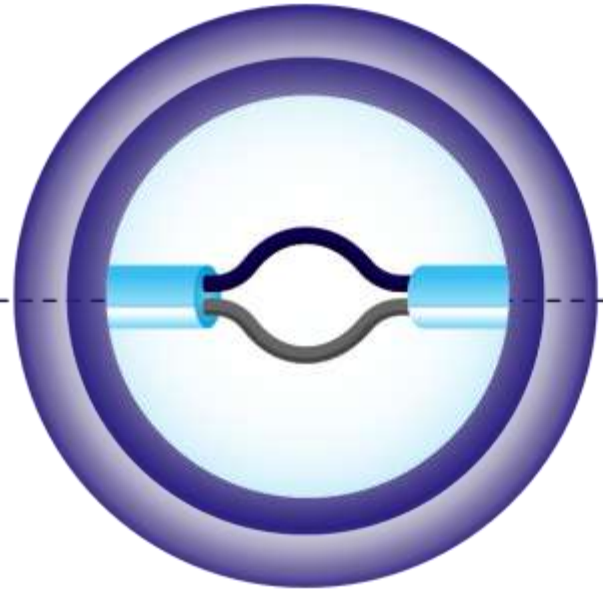


Industry Standard 4-Core Cable



IGD Addressable 2-Core Cable

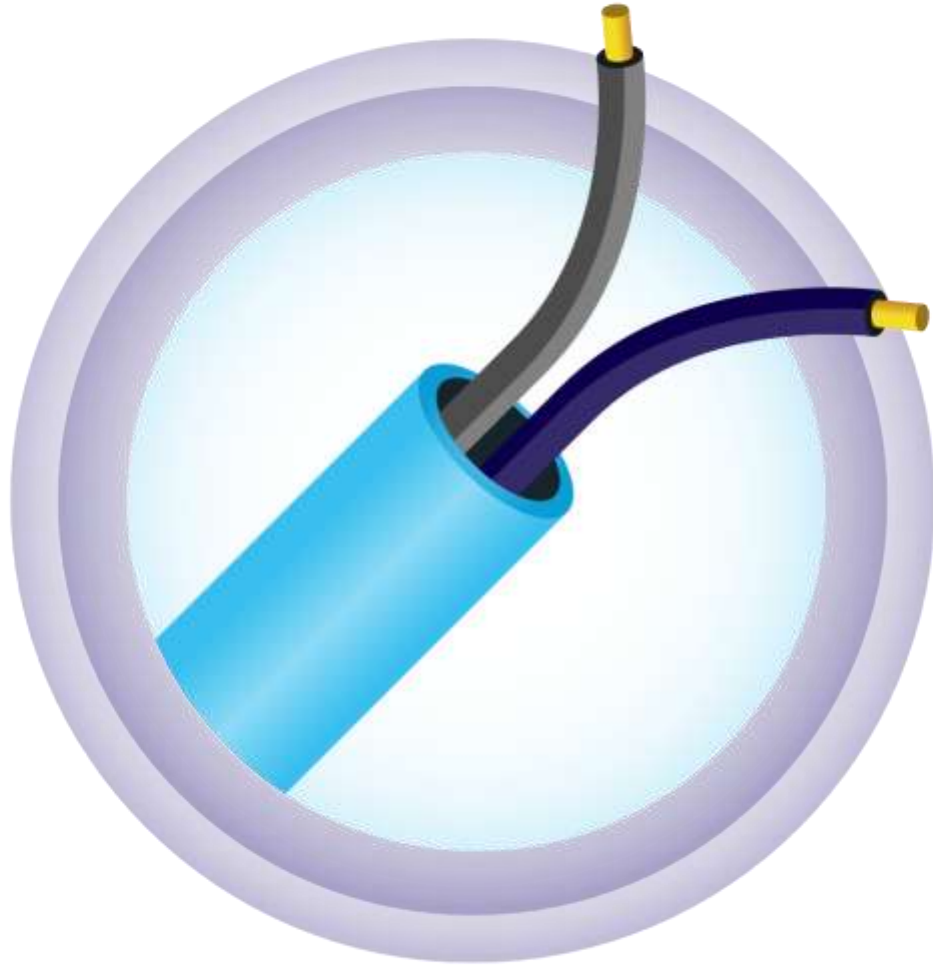




Unbeatable speeds

Unparalleled reliability

Huge savings

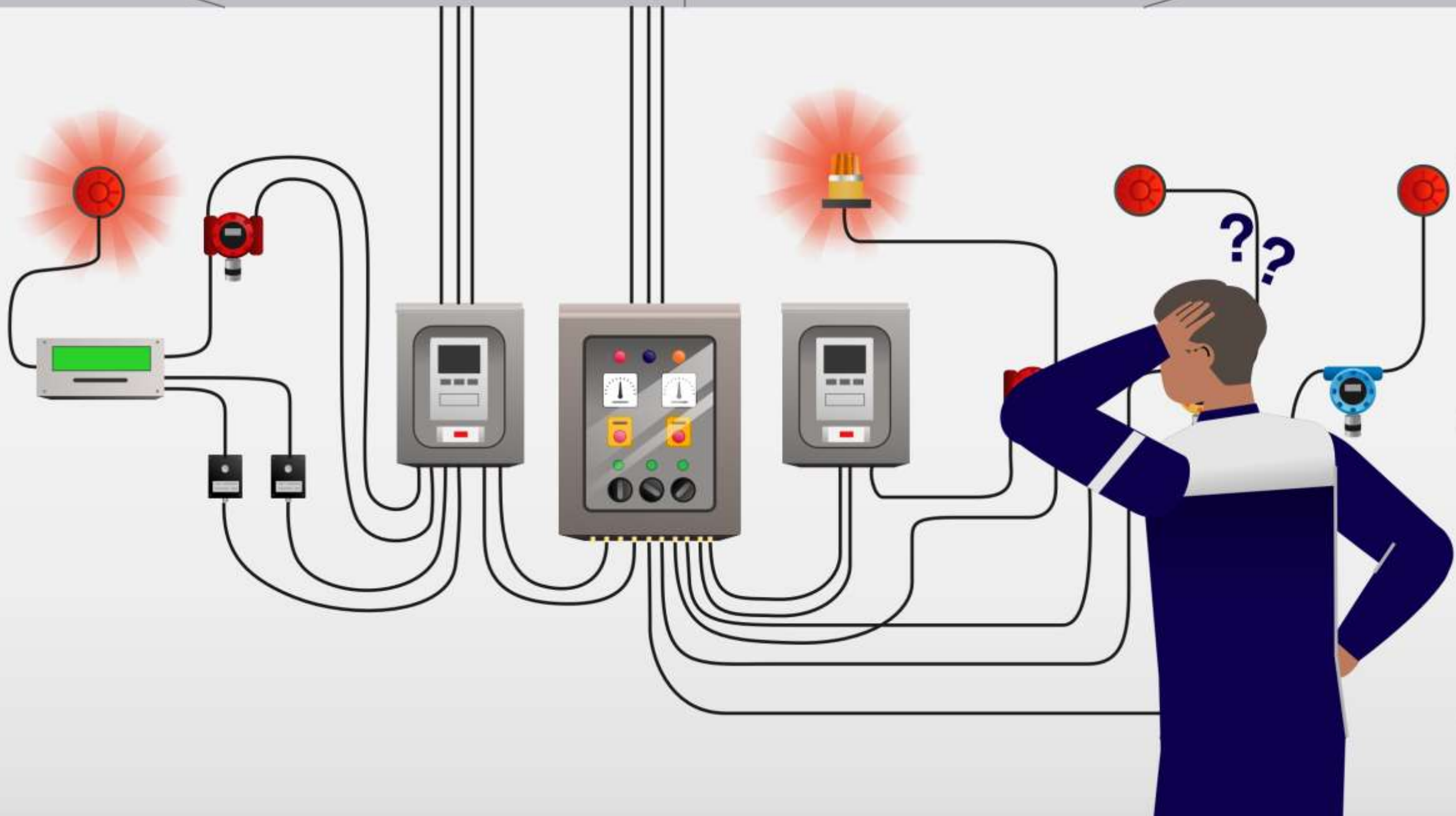


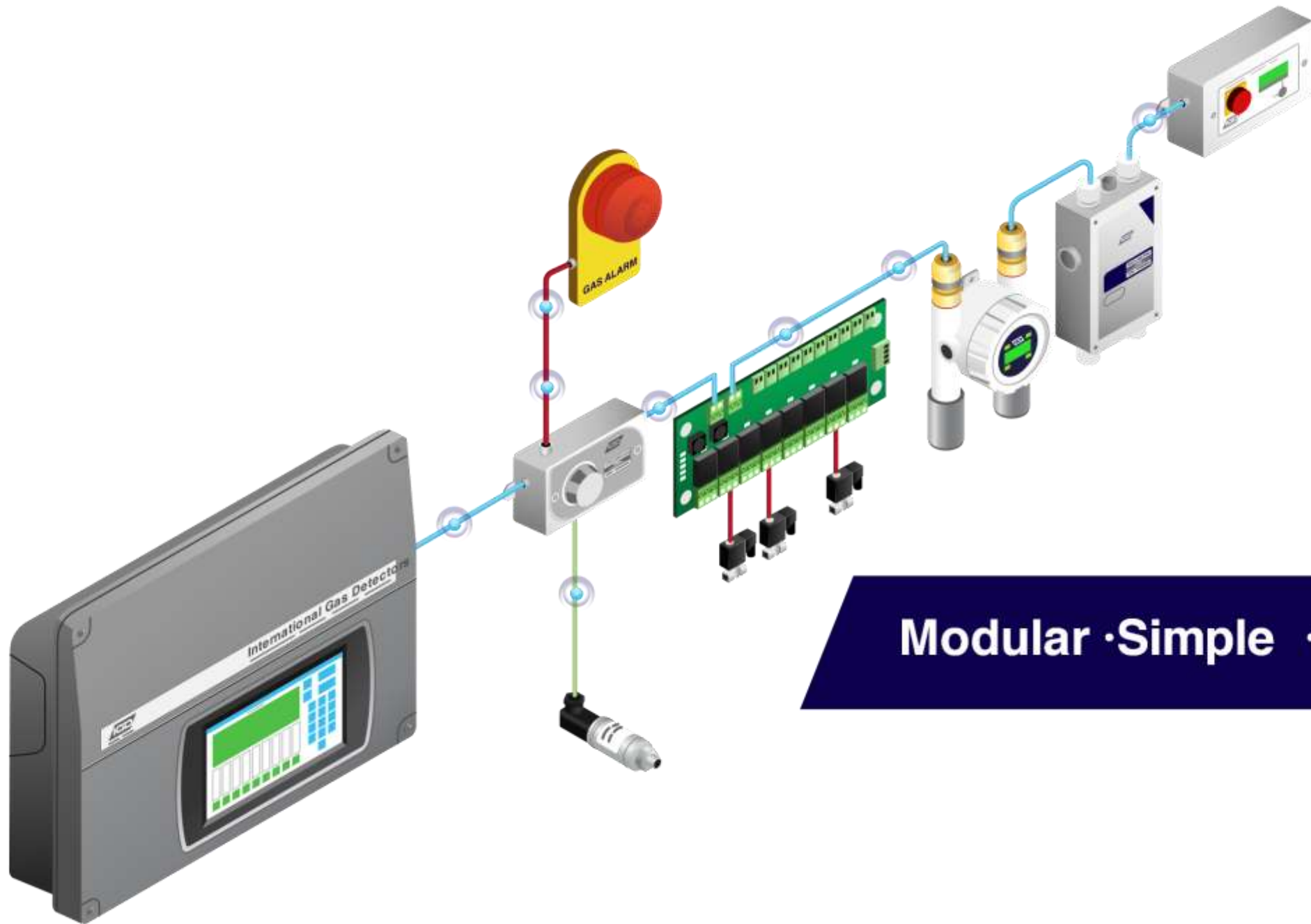
Ultimate safety



Fraction of the cost








Remote monitoring


- Built-in Wifi, enables one-man maintenance, system setup and event log downloads
- GasNet remote monitoring functionality – receive SMS & Email alerts and monitor and address your system from anywhere in the world via any mobile laptop or tablet







You owe it to
yourself and your
people to make
safety your top
priority.





Getting gas detection isn't a choice.

Who you get it from is.

- Bespoke turnkey solutions
- Advanced addressable digital tec
- 3rd party compatibility
- Combined solutions
- System training
- Full regulatory compliance



Thank you



Detectably Better



Presented by Graham Boyne –
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