

# IRmax

## Fixed Point Gas Detectors



- Simple to install
- Low maintenance
- Low cost of ownership
- Fail-safe
- Low power



# IRmax

## Infrared Hydrocarbon Gas Detector

**When lives and property are at risk and you need gas detection equipment that is totally reliable, you need Crowcon. For over 40 years Crowcon has been developing and manufacturing high quality products with a reputation for reliability and technical innovation.**

**Crowcon fixed detectors have been proven in many arduous environments, including oil and gas exploration, water treatment, and steel and chemical plants. IRmax offers uniquely low powered, fail-safe detection of hydrocarbon gases and vapours.**



### Choosing the fixed gas detector for your needs

IRmax is a compact, low power and highly rugged infrared gas detector, that delivers rapid, fail-safe detection of methane, butane, propane and many other hydrocarbon gases and vapours.

The reliability of IRmax has been proven in hot, cold, wet and saline environments, making it ideal for use offshore. Unlike conventional IR gas detectors, IRmax does not utilise heaters to prevent condensation on windows and mirrors. IRmax's unique STAY-CLIR optical components are treated with a highly durable coating that completely prevents faults due to condensation. As IRmax contains no components for artificially heating optical surfaces, power consumption is dramatically reduced, requiring only 1W of power, typically 75-90% lower than conventional IR gas detectors.

#### Simple to install

|   |  |
|---|--|
| Compact size                                      | Requires less space, effort and time to install  |
| Various installation options                      | Can be wall mounted, fitted to a 50mm (2 inch) pipe or connected to an auxiliary junction box using a choice of mounting accessories |
| Industry standard 4-20mA output                   | IRmax is compatible with virtually any control system  |
| Options for HART communications and RS-485 Modbus |  |

#### Easy maintenance

|   |  |
|---|--|
| Remote non-intrusive calibration              | The IR Display can be mounted up to 30 metres from the IRmax and test gas can be applied without requiring direct access to the detector |
| Hand-held Intrinsically Safe (I.S) calibrator | IRmax detectors fitted with an I.S barrier module can be checked and calibrated using an I.S calibration accessory                       |
| STAY-CLIR optics                              | Prevents condensation on optical components  |

#### Low cost of ownership

|  |   |
|--|---|
| Low power                                | IRmax only consumes 1W of power, enabling small power supplies and battery back up systems to be used |
| Automatic optical obscuration monitoring | Minimal routine maintenance keeps costs to a minimum  |
| Annual proof-test interval               |   |

**Please see the back page for full technical specifications.**

## IRmax options

IRmax is available either as a basic unit without display, or with three display options. The Fixed IR Display is permanently fixed to the IRmax detector to enable simple status checking and non-intrusive calibration. The Remote IR Display can be mounted up to 30 metres from the IRmax detector, simplifying checking and maintenance of detectors mounted in inaccessible areas. The Hand-Held I.S. Calibrator is available for temporary connection to IRmax detectors fitted with an I.S. Barrier Module.



### Fixed IR Display

- Large, clear display shows gas level and other status information
- Simple non-intrusive calibration
- Enables connection of hand-held HART communicators
- Can be rotated up and down to provide the optimum viewing angle



### Remote IR Display

- Can be mounted up to 30 metres from IRmax
- Removes the need to directly access the IRmax detector
- Choice of connection lead lengths



### I.S. Hand-Held Calibrator

- Enables calibration and interrogation of IRmax detectors without a Fixed or Remote IR Display
- Only one I.S. hand-held calibrator required per IRmax detector fleet
- Intrinsically Safe; suitable for use in hazardous areas

**HART**  
COMMUNICATION PROTOCOL

**STAY-CLIR**

**SIL**  
Safety Integrity Level

### HART communications

- Hand-held HART communicators can be connected to the IR Display for local diagnostics and calibration
- HART data is super-imposed onto the 4-20mA signal for communicating with HART enabled control systems
- Compatible with point-to-point or addressable HART topologies

### RS-485 Modbus

- Enables remote interrogation of IRmax
- Enables up to 32 detectors to be multi-dropped on an addressable network
- RS-485 physical platform for transmission of data up to 1Km

### Accessories



Calibration cap



Spigot gland



Duct mounting kit



Auxillary junction box



Mounting bracket kit



Remote calibration unit



Flow adaptor



I.S. remote display connecting leads

## IRmax Specification:

|                                       |  |   |                    |                |
|---------------------------------------|--|---|--------------------|----------------|
| <b>Size</b>                           | IRmax  | 158 x 75 x 57mm (6.2 x 2.9 x 2.3ins)  |                    |                |
|                                       | IRmax with Fixed IR display                              | 230 x 75 x 57mm (9 x 2.9 x 2.3ins)  |                    |                |
|                                       | IRmax with IS Barrier Module                             | 261 x 75 x 57mm (2.3 x 2.9 x 2.3ins)  |                    |                |
|                                       | Remote IR Display  | 60 x 54 x 48mm (2.3 x 2.1 x 1.9ins)   |                    |                |
| <b>Weight</b>                         | IRmax  | 1.58kg (3.5lbs)   |                    |                |
|                                       | IRmax with Fixed IR Display                              | 2kg (4.4lbs)  |                    |                |
|                                       | IRmax with IS Barrier Module                             | 2.4kg (5.3lbs)  |                    |                |
|                                       | Remote IR Display  | 0.2kg (0.4lbs)  |                    |                |
| <b>Enclosure material</b>             |  | 316 stainless steel   |                    |                |
| <b>Description</b>                    |  | Dual-beam infrared hydrocarbon gas detector with optional display   |                    |                |
| <b>Ingress protection</b>             |  | IP66  |                    |                |
| <b>Connection</b>                     |  | One M20 or 1/2" NPT cable gland entry   |                    |                |
| <b>Power</b>                          |  | 12-30 Vdc. < 1W   |                    |                |
| <b>Electrical output</b>              |  | 4-20mA current sink or source   |                    |                |
|                                       |  | 2mA dirty optics warning (at 75% obscuration, configurable)   |                    |                |
|                                       |  | 0mA detector fault signal (at 90% obscuration, configurable)  |                    |                |
|                                       |  | RS-485 Modbus (optional), HART 7 (optional)   |                    |                |
| <b>IR display</b>                     |  | 4- digit LCD with back-light  |                    |                |
|                                       |  | Function buttons can be de-activated if required  |                    |                |
|                                       |  | Terminals for connecting HART communicators (optional function)   |                    |                |
|                                       | LED  | Red: Gas detected   | Amber: IRmax fault | Green: Healthy |
|                                       | Display functions  | Gas level, obscuration level, supply voltage, signal current  |                    |                |
| Password protected functions          | Zero, calibrate, ramp output, trim zero mA, trim span mA |   |                    |                |
| <b>Operating temperature</b>          |  | -40°C to +75°C (-40°F to 167°F)   |                    |                |
| <b>Humidity</b>                       |  | 0 to 100% RH non-condensing   |                    |                |
| <b>Pressure range</b>                 |  | Atmospheric +/- 10%   |                    |                |
| <b>Repeatability</b>                  |  | +/- 2% FSD  |                    |                |
| <b>Zero drift</b>                     |  | +/- 2% FSD per year maximum   |                    |                |
| <b>Response time</b>                  |  | T90 < 4 seconds   |                    |                |
| <b>Performance</b>                    |  | Complies with EN60079-29-1  |                    |                |
| <b>Functional safety</b>              |  | IEC61508:2010, EN50402:2005 SIL2  |                    |                |
| <b>Approvals<br/>ATEX &amp; IECEx</b> | IRmax without Display                                    | Ex II 2 GD Exd IIC T6 Gb (Tamb -40 to +50°C), T4 (Tamb -40 to +75°C),<br>Ex tb IIIC T135°C Db (Tamb -40 to +75°C) |                    |                |
|                                       | IRmax with Fixed Display                                 | Ex II 2 G Exd ia IIC T4 Gb (Tamb -40 to +75°C)  |                    |                |
|                                       | IRmax with Remote Display                                | Ex II 2 GD Exd ia IIC T4 Gb (Tamb -40 to +75°C)<br>Ex tb IIIC T135°C Db (Tamb -40 to +40°C)                       |                    |                |
| <b>Zones</b>                          |  | Certified for use in Zone 1 & 2, and Zone 21 & 22 hazardous areas   |                    |                |
| <b>EMC compliance</b>                 |  | EN50270:2006, FCC CFR47 Part 15B, ICES-003  |                    |                |
| <b>Accuracy</b>                       |  | +/- 2% of reading   |                    |                |
| <b>Linearity</b>                      |  | +/- 3% of full-scale  |                    |                |

| Linearisation  | Range              |
|--|--------------------|
| Methane (CH <sub>4</sub> )                                     | 0-20, 50, 100% LEL |
| Acetone (C <sub>3</sub> H <sub>6</sub> O)                      | 0-100% LEL         |
| Butane (C <sub>4</sub> H <sub>10</sub> )                       | 0-100% LEL         |
| Ethanol (C <sub>2</sub> H <sub>5</sub> OH)                     | 0-100% LEL         |
| Ethylene (C <sub>2</sub> H <sub>4</sub> )                      | 0-100% LEL         |
| Ethyl acetate (C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> )  | 0-100% LEL         |
| Heptane (C <sub>7</sub> H <sub>16</sub> )                      | 0-100% LEL         |
| Hexane (C <sub>6</sub> H <sub>14</sub> )                       | 0-100% LEL         |
| LPG  | 0-100% LEL         |
| Octane (C <sub>8</sub> H <sub>18</sub> )                       | 0-100% LEL         |
| Methanol (CH <sub>3</sub> OH)                                  | 0-100% LEL         |
| Pentane (C <sub>5</sub> H <sub>12</sub> )                      | 0-100% LEL         |
| Petrol vapour  | 0-100% LEL         |
| Propane (C <sub>3</sub> H <sub>8</sub> )                       | 0-100% LEL         |
| Propylene (C <sub>3</sub> H <sub>6</sub> )                     | 0-100% LEL         |
| THF (Tetrahydrofuran) (C <sub>4</sub> H <sub>8</sub> O)        | 0-100% LEL         |
| Xylene (C <sub>8</sub> H <sub>10</sub> )                       | 0-100% LEL         |
| Methyl acetate (C <sub>3</sub> H <sub>6</sub> O <sub>2</sub> ) | 0-100% LEL         |
| Propylacetate (C <sub>5</sub> H <sub>10</sub> O <sub>2</sub> ) | 0-100% LEL         |
| Hexene (C <sub>6</sub> H <sub>12</sub> )                       | 0-100% LEL         |
| Paraxylene (C <sub>8</sub> H <sub>10</sub> )                   | 0-100% LEL         |
| Ethane (C <sub>2</sub> H <sub>6</sub> )                        | 0-100% LEL         |
| Ethylene dichloride (EDC)                                      | 0-100% LEL         |
| Cyclohexane (C <sub>6</sub> H <sub>12</sub> )                  | 0-100% LEL         |
| Butadiene (C <sub>4</sub> H <sub>6</sub> )                     | 0-100% LEL         |
| Toluene (C <sub>7</sub> H <sub>8</sub> )                       | 0-100% LEL         |
| Butene (C <sub>4</sub> H <sub>8</sub> )                        | 0-100% LEL         |
| Hexane (C <sub>6</sub> H <sub>14</sub> )                       | 0-100% LEL         |

Other ranges may be available, contact Crowcon.

Crowcon reserves the right to change the design or specification of the product without notice.  
Check [www.crowcon.com](http://www.crowcon.com) for updates.

[www.crowcon.com](http://www.crowcon.com)

**UK:**  
Tel: +44 (0) 1235 557700  
Fax: +44 (0) 1235 557718  
Email: [sales@crowcon.com](mailto:sales@crowcon.com)

**US:**  
Tel: +1 859 957 1039  
Toll Free: 800 527 6926  
Fax: +1 513 957 1044  
Email: [salesusa@crowcon.us](mailto:salesusa@crowcon.us)

**NL:**  
Tel: +31 10 421 1232  
Fax: +31 10 421 0542  
Email: [eu@crowcon.com](mailto:eu@crowcon.com)

**SG:**  
Tel: +65 6745 2936  
Fax: +65 6745 0467  
Email: [sales@crowcon.com.sg](mailto:sales@crowcon.com.sg)

**CN:**  
Tel: +86 (0) 10 6787 0335  
Fax: +86 (0) 10 6787 4879  
Email: [saleschina@crowcon.com](mailto:saleschina@crowcon.com)

**IN:**  
Tel: +91 22 6708 0400  
Fax: +91 22 6708 0405  
Email: [salesindia@crowcon.com](mailto:salesindia@crowcon.com)

 **CROWCON**  
Detecting Gas Saving Lives