



# ULTIMA® OPIR-5 Open Path Gas Detector

## ULTIMA OPIR-5 Open Path for Hydrocarbon Gas Detection

### Description

The ULTIMA OPIR-5 Detector is an open path IR gas detector that provides continuous monitoring of combustible hydrocarbon gas concentrations. The system consists of an IR source and receiver which continuously monitor for methane in both the 0 to 5000 ppm·m and 0 to 5 LEL·m range. A 0 to 2000 ppm·m and 0 to 1 LEL·m range is also available for monitoring propane. The ULTIMA OPIR-5 Detector provides two 4 to 20 mA analog signals proportional to each of the above ranges, in addition to a digital display and relay contacts.

The ULTIMA OPIR-5 Detector is easily aligned using the digital display and adjustable mounting arms, therefore it does not require any bulky setup equipment (e.g. digital volt meters, handheld alignment aids). The ULTIMA OPIR-5 Detector's sensitivity can be checked by placing a test gas film in front of the receiver.

The ULTIMA OPIR-5 Detector is calibrated at the factory and needs no further calibration. It also requires little maintenance except for a periodic visual inspection, test gas film check, and cleaning of the windows to assure dependable performance.

Sensor data and status information from the receiver can be transmitted up to 2,740 m (9,000 feet) to any industrial analog to digital (A/D) converter for use in multipoint computer-based monitoring.

### Applications

- Compressor Stations
- Drilling and Production Platforms
- Fence Line Monitoring
- Fuel Loading Facilities
- Gas Turbines
- LNG/LPG Processing and Storage Facilities
- Petrochemical Tanks
- Tank Farms
- Wastewater Treatment
- Bus Garages, Train Stations, Tunnels



### Features and Benefits

Dual detection range enables sensitivity to both small (ppm·m) and large (LEL·m) gas leaks

Performance approved for use in harsh environments

Single detection beam improves accuracy and reduces drift

Up to 150 metre path length

Multiple communication outputs (HART, ModBus, AMS Support) provide complete status and control capability in the control room

Unitized display for ease of operation and reduced cost

Automatic gain control compensates for dirty optics, rain and fog

## System Specifications

Sensor Type	Infrared absorption detects hydrocarbon gases over an open path
Standard Ranges	Methane 0 – 5000 ppm·m 0 – 5 LEL·m Propane 0 – 2000 ppm·m 0 – 1 LEL·m
Path Length	LEL·m: 5–30 m, 20–100 m, 50–150 m ppm·m: 5–30 m, 20–100 m, 80–150 m
Response Time	$T_{50} < 5$ s
Repeatability	$\leq \pm 5\%$
Linearity	$\leq \pm 5\%$ of full scale for each scale or $\pm 10\%$ of applied gas, whichever is greater
Classification	Class I, Div 1 & 2, Groups B, C & D Class II, Div 1 & 2, Groups E, F & G Class III Type 4X Class I, Zone 1, IIB+H <sub>2</sub> II 2 G D, Ex d IIB+H <sub>2</sub> T4 Gb Ex tb IIIC T135°C Db, IP 66/67 ( $T_{amb} = -55^{\circ}\text{C}$ to $+65^{\circ}\text{C}$ ) Haz Loc T3C ( $T_{amb} = -60^{\circ}\text{C}$ to $+75^{\circ}\text{C}$ ); Performance verified T4 ( $T_{amb} = -55^{\circ}\text{C}$ to $+65^{\circ}\text{C}$ )
Calibration	No calibration required. Field background zero adjustment provided
Modes	Setup, alignment, test gas, run
Accessories	Test gas films, mounting arm, mounting base, scope, attenuation plate
Warranty	Two years
Approvals	CSA, FM, ATEX, IEC Ex, CE Marking SIL-3 suitable HART-registered

## Environmental Specifications

Operating Temperature Range	-55 °C to +65 °C (-67 °F to +149 °F)
Operating Humidity Range	0–95% RH, non-condensing

## Mechanical Specifications

Housing	316 stainless steel
Source	135 mm dia. x 315 mm length (5.3" dia. x 12.4" length)
Receiver	135 mm dia. x 315 mm length (5.3" dia. x 12.4" length)
Conduit Entries (2)	$\frac{3}{4}$ " NPT (standard) M25 (optional)

## Electrical Specifications

Input Power	20 to 36 VDC range 24 VDC @ 12 W (max.) – source 24 VDC @ 10 W (max.) – receiver (w/relays) 24 VDC @ 5 W (max.) – receiver (no relays, no heater) <i>Consult factory for lower power consumption options for other configurations</i>		
Dual Analog Signals	600 Ohm load max.	0 – 5000 ppm·m Startup/Fault Test Gas/Setup Beam Block 0 – 5000 ppm·m 0 – 5000 ppm·m Over-range	0–5 LEL·m Startup/Fault Test Gas/Setup Beam Block 0–5 LEL·m 0–5 LEL·m Over-range
Relay Ratings	8 A @ 250 VAC / 8 A @ 30 VDC res. max. Four (4) SPDT – Fault, ppm Warning, LEL Warning and Alarm		
RS-485 Output	ModBus RTU with block and single data transfer modes		
Baud Rate	2400, 4800, 9600, 19200 or 38400 BPS		
HART	HART 6, HART Device Description Language available		
RFI/EMI Protection	Complies with EN 61000-6-4 and EN 50270		
Cable Requirements	Three-wire shielded cable. Max. distance between OPIR-5 Detector and power source @ 24 VDC nominal: 14 AWG – 280 m (930 ft) – Receiver Max. distance for analog output (250 Ohms max.): 14 AWG – 2740 m (9000 ft)		
Wireless Communication	Available with ELPRO Technologies wireless devices		
Digital Display	LED indication of scale displayed; two digit, seven segment (auto range change)		

\* HART units can be configured to never output current less than 3.5 mA if the host equipment is incapable of working below this level.

\*\* 0 to 2000 ppm·m and 0 to 1 LEL·m on propane unit.

\*\*\* Using optional split range.

## Ordering Information

ULTIMA OPIR-5  
with alarm relays, all de-energised, latch hi, non-latch LO, non-latch ppm HI

	Range 20–100 m		Range 50–150 m	
	M25	NPT	M25	NPT
DUAL 0–20 mA / DUAL MODBUS, Methane	OPIR5-111122211	OPIR5-111112111	OPIR5-1111132211	OPIR5-1111131111
DUAL 0–20 mA / DUAL MODBUS, Methane (IEC)	OPIR5-1111122311	-	OPIR5-1111132311	-
DUAL 0–20 mA / DUAL MODBUS, Propane	OPIR5-1111122511	OPIR5-1111121411	OPIR5-1111132511	OPIR5-1111131411
DUAL 0–20 mA / DUAL MODBUS, Propane (IEC)	OPIR5-1111122611	-	OPIR5-1111132611	-
DUAL 0–20 mA / HART, Methane	OPIR5-1111222211	OPIR5-1111221111	OPIR5-1111232211	OPIR5-1111231111
DUAL 0–20 mA / HART, Methane (IEC)	OPIR5-1111222311	-	OPIR5-1111232311	-
DUAL 0–20 mA / HART, Propane	OPIR5-1111222511	OPIR5-1111221411	OPIR5-1111232511	OPIR5-1111231411
DUAL 0–20 mA / HART, Propane (IEC)	OPIR5-1111222611	-	OPIR5-1111232611	-

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