Ultima® X Series **Gas Monitors**

For continuous monitoring of oxygen, toxics, and combustible gases

MSA
The Safety Company

Now with SIL 2 Certified Products

MSA's Ultima X Series Gas Monitors are microprocessor-based transmitters engineered with the customer in mind. Utilizing DuraSource Technology for extended sensor life, the monitors are available in either stainless steel or polycarbonate enclosure housings.

HART Field Communications Protocol provides increased sensor data, part of cost-effective asset management. HART also provides convenient setup, calibration and diagnostics. Calibrate, set up or perform diagnostics with HART from any point along the 4-20 mA line. HART also allows for existing component install and wiring to be used, reducing installation costs.

*Because every life has a **purpose...***

Ultima X Series **Gas Monitors**

Ultima XE Gas Monitor –

Explosion-proof, stainless steel gas detector with display

The Ultima XE Gas Monitor offers:

- Explosion-proof 316 stainless steel.
- Multiple-entry mounting enclosure.
- Type 4X, IP66.

Ultima XA Gas Monitor –

Water- and corrosion-resistant, all-purpose, polycarbonate gas detector with display

The Ultima XA Gas Monitor offers:

- NEMA 4X rating.
- Lightweight (only 1.5 lbs).

Ultima XIR Gas Monitor –

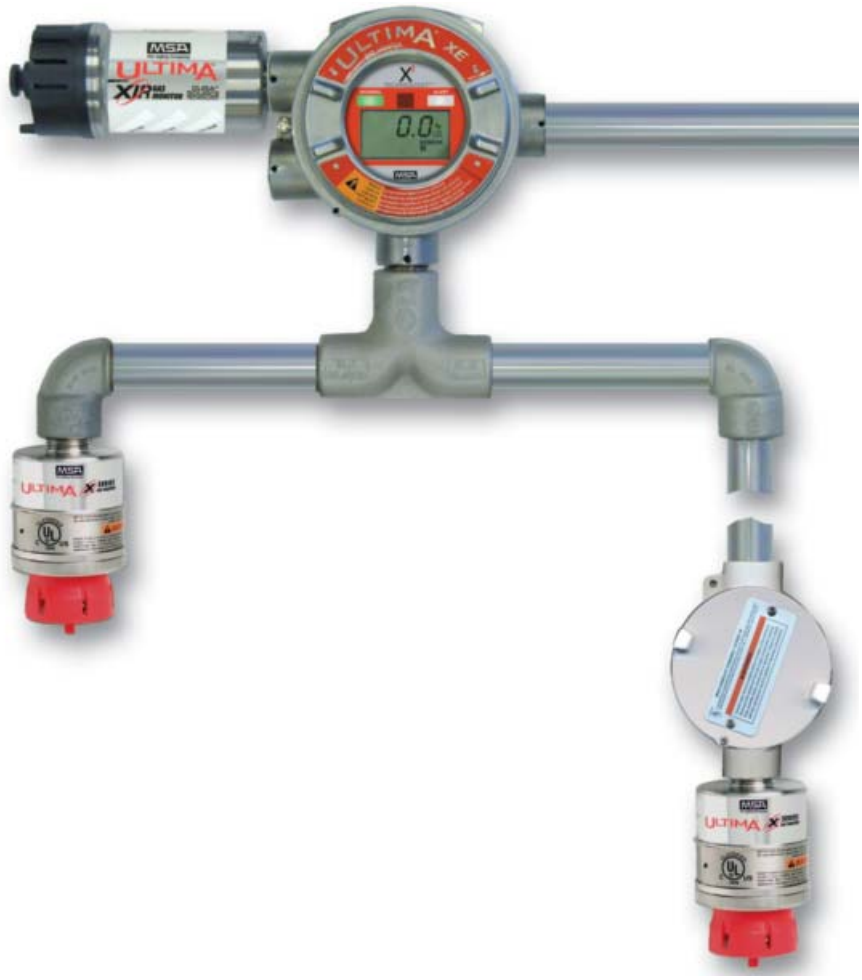
Explosion-proof, stainless steel, infrared gas detector with display

The Ultima XIR Gas Monitor offers:

- DuraSource Technology for improved IR sensor life.
- 316 stainless steel.
- Multiple-entry mounting enclosure.
- Fast response time.
- Operation based on dual-wavelength, heated-optics technology, providing definitive compensation for temperature, humidity, and aging effects.
- IR technology for excellent long-term stability, eliminating the need for frequent calibrations.
- Sintered disk-free design for optimum performance in harsh environments.
- No-gas calibration; only zero adjustment is required for full calibration.
- Type 4X, IP66 rating.

Ultima X3® **Technology**

(X to the Power of 3)



PLC/DCS
[ProSoft-Tested]

Connect X3 unit to PLC/DCS control systems. X3 Technology is ProSoft-certified and has been tested and found to be compatible with Allen-Bradley PLC/Modbus connectivity by ProSoft Technology, Inc.

Up to 3000 ft.

Ultima X3 Technology for Ultima X Series Gas Monitors features:

Multi-sensing

- Up to 31 monitors with up to 3 sensors inputted per monitor for 93-sensor total
- Combination of electrochemical-, catalytic-, and infrared-type sensors is available
- Scrolling display – monitor scrolls through type and reading for all attached sensors
- Operation of monitor as network slave device

Signal boost

- Each sensor is remotely observable up to 3000 ft from the monitor
- Universal 85-256 VAC or 8-30 VDC power supply available at remote condulet

ModBus RTU output

- Industry standard format
- RS-485 half-duplex communication interface
- PLC/DCS systems integration

Power Supply

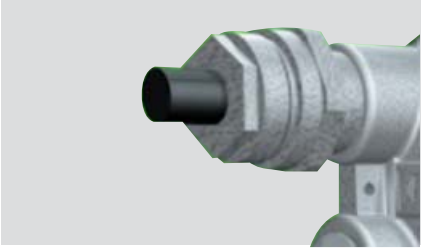
Ultima X Series Monitors external power supply can power sensors remotely; one remote power supply module can power:

- up to 5 electrochemical or oxygen sensors.
- up to 3 combustible sensors.
- internal power supply option also available.

Pushbutton

Pushbutton feature lets users view various functions without calibrator:

- alarm acknowledge
- zero calibration initialization
- SPAN calibration initialization
- iCAL calibration initialization
- calibration abort



Duct-Mount Kit

Duct-mount Kit allows users to monitor air within ductwork using the Ultima XE, XA, or XIR sensor. Quick-disconnect fitting enables calibration gas to reach sensors without duct-mounted sensor removal.

Pump

Sampling pumps bring remote samples to sensors. Sampling modules are available in GP and XP versions of aspirated and pumped modules.

Calibrator

Ultima Monitor Calibrator offers the industry's simplest calibration method, a three-button device allowing Ultima X Series Monitors calibration and address changes.

Controller

Ultima Monitor Controller provides complete access to all features through its full-function keypad: alarm level set, span gas value changes, and last calibration date display.

HART Port

Intrinsically-safe connection for a HART communicator.

Ultima® X Series **Gas Monitors**

Ultima X Series Gas Monitors are well-suited to indoor and outdoor applications in virtually any industry including offshore, refineries, chemical and petrochemical facilities, steel mills, water and wastewater plants, mining, and general industry.

- Continuous hazardous gas monitoring using catalytic, electrochemical, and infrared gas detection methods.
- DuraSource Technology provides extended infrared sensor life
- HART Field Communications Protocol option for improved asset management
- Patented sensor disconnect-under-power allows sensor change-out without declassifying a hazardous area
- Interchangeable smart sensors: pre-calibrated, installation-ready sensor modules, field-replaceable without tools
- New sensor type quick recognition and reconfiguration of alarm and relay settings
- LCD conveniently alternates between sensor reading and gas type, plus scrolling messaging for ongoing diagnostic checks
- Single-board design for ultimate reliability and serviceability

Ultima X Series installation and operation are both simple and flexible:

- Operates in diffusion mode, with factory-calibrated sensors ready to perform immediately after installation
- Offers HART upgrade of existing units via replacement PCBA
- Available for remote sensing applications, where installations require sensor to be separated from electronics
- Can operate completely stand-alone with large LCD display, optional quick-check LEDs, and 4 relay outputs (3 alarm and 1 fault), or connected with standard 4-20 mA output to a control system (PLC, DCS, etc)
- Adjustable full-scale range
- Easy installation with 2-piece, field-wiring connectors

Calibration

As with all gas monitors, Ultima X Series Gas Monitors must be calibrated periodically with the gas of interest to ensure proper operation. The calibration process offers:

- Automatic adjustments
- Date stamping
- Calibration instructions displayed on monitor
- Selectable lockout of output signal during calibration
- Ability to calibrate at the installation location or remotely without systems interruption
- Accessory calibrator, controller or pushbutton for calibration initiation

Gases

Acetylene IR- 0-2.5%
Ammonia- 0-50% LEL
Ammonia- 0-100 PPM
Ammonia- 0-1000 PPM
Arsine- 0-2 PPM
Bromine- 0-5 PPM
Carbon dioxide IR- 0-0.5%
Carbon dioxide IR- 0-2%
Carbon dioxide IR- 0-5%
Carbon monoxide- 0-100 PPM
Carbon monoxide- 0-500 PPM
Carbon monoxide- 0-1000 PPM
Chlorine- 0-5 PPM
Chlorine- 0-10 PPM
Chlorine- 0-20 PPM
Chlorine dioxide- 0-3 PPM
IR combustible gas - Methane- 0-100% LEL
IR combustible gas - Non-methane- 0-100% LEL
Combustible gas- 0-100% LEL natural gas and H_2
Combustible gas- 0-100% LEL petroleum vapors
Combustible gas- 0-100% solvents
Diborane- 0-50 PPM
Ethylene oxide- 0-10 PPM
Fluorine- 0-5 PPM
Hydrogen fluoride- 0-10 PPM
Hydrogen- 0-1000 PPM
Hydrogen chloride- 0-50 PPM
Hydrogen cyanide- 0-50 PPM
Hydrogen sulfide- 0-10 PPM
Hydrogen sulfide- 0-50 PPM
Hydrogen sulfide- 0-100 PPM
Hydrogen sulfide- 0-500 PPM
Nitric oxide- 0-100 PPM
Nitrogen dioxide- 0-10 PPM
Oxygen- 0-10% - compensated
Oxygen- 0-25% - compensated
Oxygen - CO2 tolerant- 0-25%
Oxygen - solvent tolerant- 0-25%
Phosphine- 0-2 PPM
Silane- 0-25 PPM
Sulfur dioxide- 0-25 PPM
Sulfur dioxide- 0-100 PPM

Specifications for Ultima XE, Ultima XA and Ultima XIR

GAS TYPES		XE,XA XIR	Combustibles, oxygen, and toxics Combustibles; 0-100% LEL
TEMPERATURE RANGE			-40° C to +60° C (-40° F to +140° F) (Typical range for some gases may differ)
DRIFT	Zero Drift Span Drift	XE, XA XIR XE, XA	<5%/year, typical ±2%/year, typical <10%/year, typical
NOISE			<1% full scale
ACCURACY	Repeatability Linearity	XE, XA, XIR XE, XA XIR XE, XA XE, XA, XIR XE, XA	±1% full scale or 2ppm, typical ±2% full scale or 2ppm, (O_2, CO) ±2% full scale (≤50% LEL) ±3% full scale (<50% LEL combustibles) ±5% full scale (>50% LEL combustibles) ±10% full scale or 2 ppm, (non-CO toxics)
RESPONSE TIMES	T20 O_2 & toxics T50 O_2 & toxics T50 combustible T90 combustible T90 combustible	XE, XA XE, XA XE, XA XE, XA XIR	<12 seconds (typically 6 seconds) <30 seconds (typically 12 seconds) <8 seconds <30 seconds <2 seconds
HUMIDITY		XE, XA XIR	15%-95% RH, non-condensing 0%-95% RH, non-condensing
SENSOR LIFE	Oxygen & toxics Combustible Combustible Warranty	XE, XA XE, XA XIR	2 years typical 3 years typical 10 years typical 1 year XE, XA; 2 years XIR; 10 years XIR, XI (IR source only)
POWER INPUT		XE, XA XE, XA XIR	8-30 VDC (oxygen and toxics) 2.4 W max 8-30 VDC (combustibles) 5.0 W max 10-30 VDC 7.0 W max
WIRING REQUIREMENTS	Combustible Oxygen & toxics Oxygen & toxics	XE, XA, XIR XE, XA XE, XA	3-wire 2-wire; no LEDs or relays 3-wire; LEDs and/or relays
SIGNAL OUTPUT		XE, XA XE, XA, XIR XE, XA, XIR	4-20 mA 2-wire current sink 4-20 mA 3-wire current source HART Output
RELAY CONTACT RATING			5 amp @ 220 VAC; 5 amp @ 30 VDC
HOUSING ENTRIES		XE, XIR XA	Four conduit entries, ¾" NPT or 25 mm One entry
PHYSICAL		XE XA XIR	316 stainless steel; 10.4 lbs (4.7 kg) 6.3" W x 3.9" D x 10.3" L (160 x 99 x 261 mm) Polycarbonate; 1.5 lbs (0.68kg) 5.1" W x 2.9" D x 9.4" L (130 x 76 x 239 mm) 316 stainless steel; 10.8 lbs (4.9 kg) 12.6" W x 3.9" D x 5.7" L (320 x 99 x 144 mm)
APPROVAL RATINGS		Ultima X Series Monitors XA Ultima X Series Monitors Ultima X Series Monitors (not including X3 Technology or Hart)	**USA/Canada** cFMus, cULus, CSA Class I, Div. 1 and 2, Groups A, B, C, D Class II, Div. 1, Groups F & G, Class III Type 4X, IP66 ANSI/ISA 12.13.01 CSA C22.2 No.152, Class I, Div. 1, Groups A,B,C,D CSA C22.2 No. 152, Class I, Div. 1, Groups B,C,D (XIR) NEMA 4X rating **Europe** CE Low Voltage/EMC/ATEX, EN 60079-1 11 2G⟨Ex⟩d 11C T4 IP 66 **SIL Certification** SIL 2 @ HFT=0 (oxygen, catalytic combustible, and IR) SIL 1 @ HFT = 0: SIL 2 @ HFT = 1 (toxic)