

# Ultima<sup>®</sup> X Series Gas Monitors

For continuous monitoring of oxygen, toxics, and combustible gases



*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 4-20mA 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 –

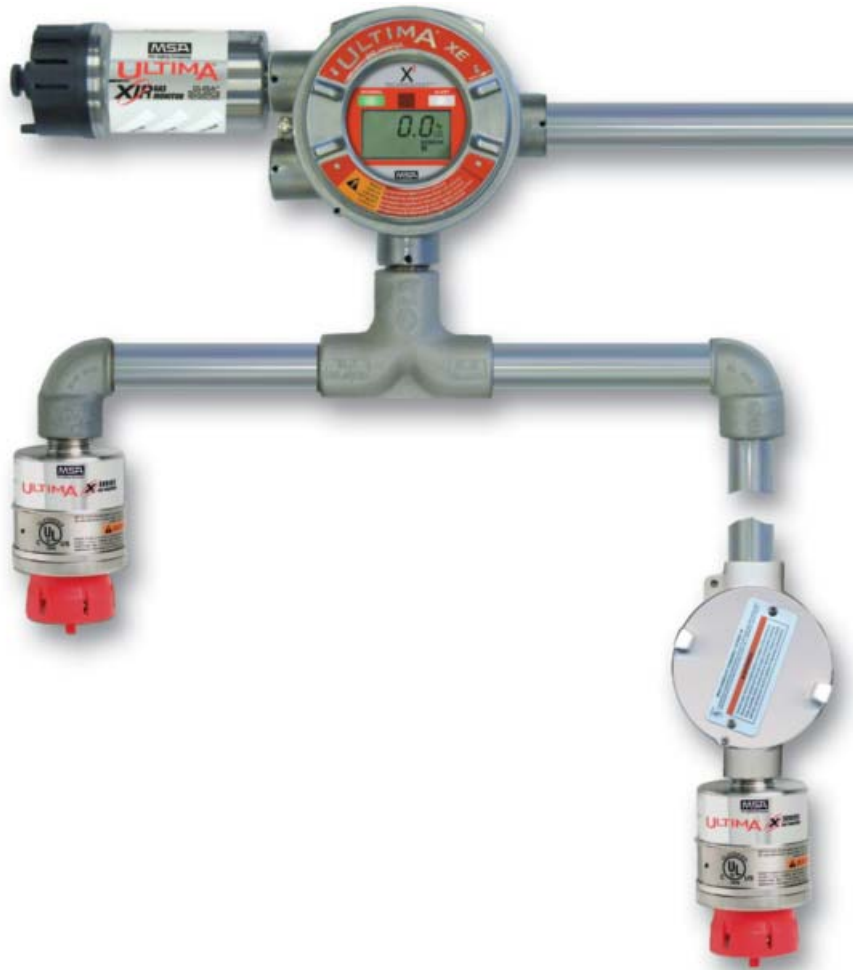
*Explosion-proof, stainless steel, infrared gas detector with display*

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<sup>®</sup> Technology



## 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 conduit

### 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:

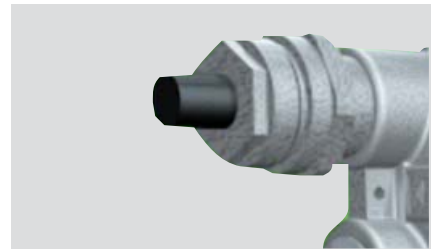
- up to 5 electrochemical or oxygen sensors.
- up to 3 combustible sensors.
- internal power supply option also available.



## 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 4-20mA 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%        | Chlorine- 0-5 PPM         | Combustible gas- 0-100% solvents | Hydrogen sulfide- 0-500 PPM      |
| Ammonia- 0-50% LEL          | Chlorine- 0-10 PPM        | Diborane- 0-50 PPM               | Nitric oxide- 0-100 PPM          |
| Ammonia- 0-100 PPM          | Chlorine- 0-20 PPM        | Ethylene oxide- 0-10 PPM         | Nitrogen dioxide- 0-10 PPM       |
| Ammonia- 0-1000 PPM         | Chlorine dioxide- 0-3 PPM | Fluorine- 0-5 PPM                | Oxygen- 0-10% - compensated      |
| Arsine- 0-2 PPM             | IR combustible gas -      | Hydrogen fluoride- 0-10 PPM      | Oxygen- 0-25% - compensated      |
| Bromine- 0-5 PPM            | Methane- 0-100% LEL       | Hydrogen- 0-1000 PPM             | Oxygen - CO2 tolerant- 0-25%     |
| Carbon dioxide IR- 0-0.5%   | IR combustible gas -      | Hydrogen chloride- 0-50 PPM      | Oxygen - solvent tolerant- 0-25% |
| Carbon dioxide IR- 0-2%     | Non-methane- 0-100% LEL   | Hydrogen cyanide- 0-50 PPM       | Phosphine- 0-2 PPM               |
| Carbon dioxide IR- 0-5%     | Combustible gas- 0-100%   | Hydrogen sulfide- 0-10 PPM       | Silane- 0-25 PPM                 |
| Carbon monoxide- 0-100 PPM  | LEL natural gas and H2    | Hydrogen sulfide- 0-50 PPM       | Sulfur dioxide- 0-25 PPM         |
| Carbon monoxide- 0-500 PPM  | Combustible gas- 0-100%   | Hydrogen sulfide- 0-100 PPM      | Sulfur dioxide- 0-100 PPM        |
| Carbon monoxide- 0-1000 PPM | LEL petroleum vapors      |                                  |                                  |

# Specifications for Ultima XE, Ultima XA and Ultima XIR

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

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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**MSA – The Safety Company**  
1000 Cranberry Woods Drive  
Cranberry Township, PA 16066 USA  
Phone 724-776-8600  
[www.MSAafety.com](http://www.MSAafety.com)

**U.S. Customer Service Center**  
Phone 1-800-MSA-INST  
Fax 1-800-967-0398

**MSA Canada**  
Phone 1-800-672-2222  
Fax 1-800-967-0398

**MSA Mexico**  
Phone 01 800 672 7222  
Fax 52 - 44 2227 3943

**MSA International**  
Phone 724-776-8626  
Toll Free 1-800-672-7777  
Fax 724-741-1559  
Email [msa.international@msanet.com](mailto:msa.international@msanet.com)