

The **OBSERVER-i** is the world's first ultrasonic gas leak detector equipped with Artificial Neural Network (ANN) real-time broadband acoustic sound processing technology. This technology is based on extensive studies and real recording of gas leak sounds and industrial background noise from a wide array of industry sources over the years. The ANN algorithm has been "trained" with these recordings to automatically distinguish between unwanted acoustic background noise and dangerous gas leaks.



## Description

With ANN technology, the OBSERVER-i makes it possible to fully analyze the sound spectrum as low as 12 kHz since common high pass filters are not used. This provides a broader leak detection range which also increases sensitivity to smaller gas leaks, without interference from unwanted background noise.

ANN technology enables the OBSERVER-i to be installed without time consuming "training" sequences, and provides industry-leading detection distance, with unprecedented suppression of false alarms. In addition, ANN technology ensures that the OBSERVER-i has the same gas leak detection coverage in high and low noise areas. The device requires no alarm set points or trigger levels to be configured, nor do these alarm parameters need to be adjusted if background ultrasound were to increase or decrease over time.

The OBSERVER-i is backwards compatible with earlier versions of the Observer by means of the Classic Mode setting wherein ANN is disabled and the legacy electrical interface is used.

The OBSERVER-i features the patented Senssonic™ self-test function. This well-proven self-test checks the device's electrical integrity and microphone every 15 minutes and ensures the OBSERVER-i is operational at all times. The microphone and the microphone windscreen are constantly monitored to ensure that the detector always has optimal sensitivity and detection coverage.

## Features & Benefits

Features	Benefits
<b>Artificial Neural Network (ANN)</b>	Improved detection range and background noise rejection prevents false alarms
<b>Senssonic™ integrated acoustic self-test</b>	Failsafe operation
<b>One-person acoustic sound check with traceable portable test unit</b>	High reliability and trouble free maintenance
<b>HART and Modbus</b>	Provides complete status and control capability in the control room
<b>Event logging</b>	Stores fault, sound check, calibration, and alarm event history
<b>Detects gas leaks from 2 BAR (29 psi) pressure</b>	Very small gas leaks can be detected quickly

## Applications

- Floating Production Storage and Offloading Vessels (FPSOs)
- Gas Compressor and Metering Stations
- Gas Storage Facilities
- Hydrogen Storage Facilities
- LNG / GTL Trains
- LNG Re-gasification Plants
- Offshore and Onshore Oil and Gas Installations
- Petrochemical Processing Plants



## Specifications

System Specifications	
<b>Detector Type</b>	Ultrasonic (acoustic) gas leak detector
<b>Background Noise Rejection Method</b>	Artificial Neural Network (ANN)
<b>Gas Leak Recognition Method</b>	Artificial Neural Network (ANN)
<b>Min. Acoustic Det. Frequency (ANN Mode)</b>	12 kHz
<b>Min. Detection Limit</b>	40 dB (u)
<b>Accuracy</b>	±3 dB
<b>Self-test</b>	Performed every 15 minutes
<b>Min. Pressure Requirement</b>	2 BAR (29 psi)
<b>Detector Coverage (ref. Methane)</b>	<p><b>Enhanced Mode (ANN) (@ 0.1 kg/sec):</b>            FQHI setting (59 dB ANN sensitivity level):            17 meters (56 ft.) Default  <i>Ultra-high to medium background noise</i>            FQLO setting (54 dB ANN sensitivity level):            28 meters (92 ft.)  <i>Medium to low background noise</i></p> <p><b>Classic Mode (@ 0.1 kg.sec):</b>            Ultra-high: 7 meters (23 ft.) w/84 dB T.L.            High: 12 meters (39 ft.) w/74 dB T.L.            Medium: 18 meters (59 ft.) w/64 dB T.L.            Low: 24 meters (79 ft.) w/54 dB T.L.</p>
<b>Response Time</b>	< 1 s (speed of sound)
<b>Approvals Classification</b>	<p><b>ATEX/IECEx:</b>            Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db (Ta = -40°C to +60°C)</p> <p><b>CSA:</b>            Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db</p> <p><b>FM/CSA:</b>            Class I, Div. 1, 2 Groups B,C,D;            Class II, Div. 1, 2 Groups E,F,G; Class III, T5 (Ta = -40°C to +60°C)</p>
<b>Approvals</b>	ATEX, CSA, FM, IECEx, CE HART 6.0 registered FM certified to IEC 61508 (SIL 3)
<b>Accessories</b>	1701 Test and Calibration Unit SB100 Bump Test Tool
<b>Device Drivers</b>	DDL, DTM available at <a href="http://MSAsafety.com">MSAsafety.com</a>
<b>Warranty</b>	2 years

Electrical Specifications	
<b>Input Power</b>	15–36 VDC, 250 mA max. 24 VDC, 170 mA nominal
<b>Relay Ratings (optional)</b>	8 A @ 250 VAC
<b>Current Output (sink or source)</b>	<p><b>Status Indications:</b>            0 mA: Start up, no power            1 mA: Pulsed acoustic error            3 mA: Unit inhibit</p> <p><b>Classic Mode:</b>            4–20 mA, 40–120 dB (u)</p> <p><b>ANN Mode:</b>            4–12 mA, 40–120 dB (u)            16 mA, warning            20 mA, alarm</p>
<b>EMC/RFI</b>	EMC Directive 2004/108/EC EN 61000-6-2, EN 61000-6-4
<b>Serial Digital Communication</b>	HART, Modbus
<b>Cable Requirements</b>	Max. cable length between Observer-i and power source @ 24 VDC (20 ohm) 2.08 mm <sup>2</sup> (14 AWG) – 1,809 m (5,928 ft)
Environmental Specifications	
<b>Operating Temperature Range</b>	-40°C to 60°C (-40°F to 140°F)
<b>Operating Humidity Range</b>	10–95% RH, non-condensing
Mechanical Specifications	
<b>Housing</b>	Stainless Steel AISI 316L
<b>Dimensions</b>	203 x 203 x 201 mm (7.99 x 7.99 x 7.91 in)
<b>Weight</b>	7.5 kg (16.6 lbs)
<b>Conduit Entries</b>	M20 x 1.5 (additional ¾" NPT adapter available)
<b>Mounting Holes</b>	2 x mounting screws – M8 x 19 max
<b>Ingress Protection</b>	IP66 / Type 4X
<b>Standard Configuration</b>	OBSERVER i-1-1-1-1-1-1

**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. Specifications subject to change without notice.

Corporate Headquarters:  
**MSA**  
 1000 Cranberry Woods Drive  
 Cranberry Township, PA 16066, USA  
 Phone +1-724-776-8600  
 info.us@MSAsafety.com

Design Center:  
**General Monitors**  
 26776 Simpatica Circle  
 Lake Forest, CA 92630, USA  
 Phone +1-949-581-4464  
 info.gm@MSAsafety.com