

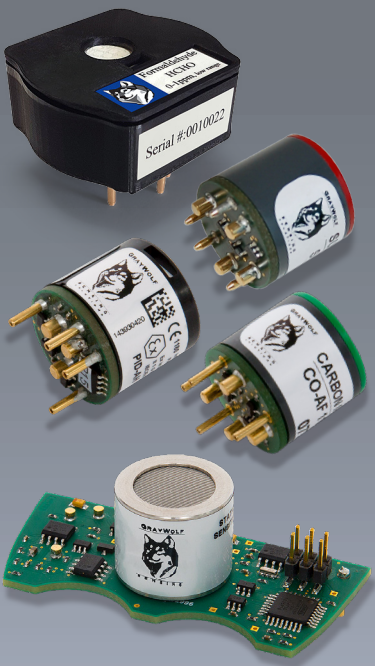


✓ Surveyed

✓ Datalogged

✓ Documented

✓ Reported



User Swappable  
Smart Sensors



Up to 8 Sensors  
in one Probe



# GRAYWOLF SENSORS

Smart Sensors Plus



**GRAYWOLF®**  
**SENSING SOLUTIONS**  
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**25+ years with a primary focus on the Indoor Air Quality market, while also providing toxic exposure sensors for occupational hygienists and researchers, GrayWolf offers a wide range of sensors optimized for a variety of applications. And acting on the feedback from our extensive list of customers for IAQ, IH, R&D, HVAC, Green Buildings, and other focuses, we continue to expand our range of very smart sensors and compatible platforms.**

- Choose from TVOCs, CO<sub>2</sub>, HCHO, CO, O<sub>3</sub>, NO<sub>2</sub>, NH<sub>3</sub>, H<sub>2</sub>S, NO, SO<sub>2</sub>, Cl<sub>2</sub>, HCN, HF, HCl, O<sub>2</sub>, H<sub>2</sub>, F<sub>2</sub>, EtO (C<sub>2</sub>H<sub>4</sub>O), AsH<sub>3</sub>, B<sub>2</sub>H<sub>6</sub>, ClO<sub>2</sub>, COCl<sub>2</sub>, PH<sub>3</sub>, SiH<sub>4</sub>, with more gases coming.
- Sensors are truly plug & play, easily swapped by users. Exceptional calibration accuracy/ repeatability across platforms.
- Factory calibration is stored on the sensor's GrayWolf designed smart board and calibration certificates are provided. NIST-traceable calibration available for most sensors.
- Internal fans increase sensor response time, remove component generated heat.
- Multiple ranges are available for some sensors (e.g. TVOCs, NH<sub>3</sub>, CO<sub>2</sub><sup>†</sup>) for optimum suitability for IAQ vs. toxic exposure applications.
- Via Bluetooth LE, Wi-Fi, and/or cable, connect DSXM installed sensors to a choice of platforms; GrayWolf manufactured, purpose-built meters/ monitors, Windows/Android/iOS/macOS devices, and/or remote to the GrayWolfLive® Cloud app.
- Calibration kits are available to allow for user calibration on-site for most sensors, to ensure top level confidence when spot testing and long-term datalogging.

\*US Patent 10,348,834 SELF CONFIGURING SMART PROBE  
† INQUIRE



# GRAYWOLF GAS SENSOR SPECS

## DirectSense® XM/II Smart Sensor Specifications Summary

SENSOR	RESOLUTION (PPM)	RANGE (PPM)	SENSOR L.O.D. (PPM)	TYPICAL DRIFT	T <sub>90</sub> RESPONSE	RECOMMENDED CAL FREQUENCY <sup>i</sup>	EXPECTED LIFE
<b>NDIR</b>							
Carbon Dioxide (CO <sub>2</sub> )	1	0 to 10,000	<1	<80 ppm / year <sup>ii</sup>	<20s	≤12 months <sup>iii</sup>	>10 years
<b>PID (TVOC, 10.6eV)</b>							
Low (ppb) range TVOC	0.001	0 to 40	0.001	<5 ppb / day (at zero), <50 ppb / day (at span)	<8s	2 weeks User, <sup>iv</sup> ≤12 months Factory	>5 years <sup>v</sup>
Mid-low range TVOC	0.01	0 to >200	0.02		<8s	2 weeks User, ≤12 months Factory	>5 years <sup>v</sup>
Mid-high (ppm) range TVOC	0.1	0 to 4,000	0.1		<3s	2 weeks User, ≤12 months Factory	>5 years
High (ppm) range TVOC	0.1	0 to >10,000	0.5		<3s	2 weeks User, ≤12 months Factory	>5 years
<b>ELECTROCHEMICAL</b>							
Ammonia (NH <sub>3</sub> )	0.1	0 to 100	<1	<20% / year	<75s	≤12 months	>24 months
Ammonia (NH <sub>3</sub> ) High Range TOX	1	0 to 1,000	<5	<20% / year	<75s	≤12 months	>24 months
Arsine (AsH <sub>3</sub> )	0.01	0 to 1	<0.02	<5% / month	<60s	<12 months <sup>vi</sup>	18-24 months
Carbon Monoxide (CO)	0.1	0 to 500	<0.1	<10% / year	<30s	≤12 months	36-60 months <sup>ix</sup>
Chlorine (Cl <sub>2</sub> )	0.01	0 to 20	<0.02	<10% / year	<60s	≤12 months <sup>vi</sup>	>24 months
Chlorine Dioxide (ClO <sub>2</sub> )	0.01	0 to 1	<0.03	<10% / 6 months	<90s	≤6 months <sup>vi</sup>	>24 months
Diborane (B <sub>2</sub> H <sub>6</sub> )	0.01	0 to 1	<0.02	<10% / 6 months	<30s	≤6 months <sup>vi</sup>	>18 months
Ethylene Oxide (EtO)	0.1	0 to 100	<0.1		<150s	≤12 months	>24 months
Fluorine (F <sub>2</sub> )	0.01	0 to 1	<0.01	<10% / 6 months	<60s	≤4 months <sup>vi</sup>	>18 months
Formaldehyde (HCHO) <sup>vii</sup>	0.001	0 to 1	<0.01	<10% / 6 months	<120s	≤6 months	>36 months
Hydrogen (H <sub>2</sub> )	1	0 to 1,000	<2	<2% / month	<35s	≤6 months	>24 months
Hydrogen Chloride (HCl)	0.1	0 to 20	<0.2	<2% / month	<60s	≤6 months	>24 months
Hydrogen Cyanide (HCN)	0.01	0 to 100	<0.05		<70s	≤4 months	>12 months
Hydrogen Fluoride (HF)	0.1	0 to 10	<0.1	<5% / month	<90s	≤6 months <sup>vi</sup>	>18 months
Hydrogen Sulfide (H <sub>2</sub> S)	0.01	0 to 50	<0.03	<2% / year	<30s	≤12 months	24-48 months <sup>ix</sup>
Nitric Oxide (NO)	0.1	0 to 250	<0.2	<5% / year	<45s	≤12 months	24-48 months <sup>ix</sup>
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>x</sup>	0.01	0 to 20	<0.02	<20 ppb / year (at 0)	<80s	≤12 months	24-48 months <sup>ix</sup>
Ozone (O <sub>3</sub> )	0.01	0 to 1	<0.02	<10% / 6 months	<60s	≤12 months <sup>viii</sup>	12-18 months <sup>xi</sup>
Phosgene (COCl <sub>2</sub> )	0.01	0 to 1	<0.02	<10% / 6 months	<150s	≤12 months <sup>vi</sup>	>15 months
Phosphine (PH <sub>3</sub> )	0.1	0 to 10	<0.1	<10% / year	<25s	≤12 months	>24 months
Silane (SiH <sub>4</sub> )	0.1	0 to 50	<0.1	<2% / month	<60s	≤12 months	>24 months
Sulfur Dioxide (SO <sub>2</sub> )	0.1	0 to 50	<0.1	±15% / year	<20s	≤12 months	24-48 months <sup>ix</sup>
	<b>RES %</b>	<b>RANGE %</b>	<b>LOD %</b>	<b>TYPICAL DRIFT</b>	<b>T<sub>90</sub> RESPONSE</b>	<b>CAL FREQUENCY</b>	<b>EXP. LIFE</b>
Oxygen (O <sub>2</sub> )	0.1	0 to 25	<0.2	<1% / 3 months	<15s	≤12 months	24-36 months

Any sensor(s) used for safety critical situations, such as OSHA TWAs or STELs, must be User calibrated or, at minimum, exposed to a target gas (bump tested) to assure sensor response each day of use with a reference gas close to the critical level. Failure to carry out such tests may jeopardize the safety of people and property. For optimum accuracy, it is advised to perform more frequent User calibrations of zero and/or span (dependent on application). GrayWolf makes the User calibration procedure simple and reliable. The software walks users through the calibration process. Calibration kits and appropriate reference gases are available for shipment to most locations.

- i Calibration may be User Cal or Factory/Lab Cal. However, annual Factory/Lab calibration is recommended even if User calibrations are being performed more often.
- ii Over the full (0 - 10,000ppm) range, accuracy of +/-50ppm, +/-3% of reading.
- iii Exceptional accuracy of +/-35ppm over the "IAQ critical range" range (350ppm - 2000ppm), assuming quarterly cal. GrayWolf offers User calibration kits to help maintain optimum accuracy between Factory/Lab calibrations.
- iv While GrayWolf recommends <2 week User cal intervals, years of customer feedback has indicated that User calibrations at 4 to 8 week intervals is satisfactory for most IAQ applications.
- v PIDs carry a 1 year warranty. Their lamps and electrode stacks are rated 10,000 hours lit and usually perform far better. Unless clients are running probes 24/7, GrayWolf's experience is that it is rare to replace lamps or detector stacks <4 years.
- vi For User calibrations, a surrogate reference gas is recommended. Contact GrayWolf for details.
- vii DirectSense II probes manufactured prior to Sept 2021 are NOT compatible with the Formaldehyde sensor.
- viii For User calibrations, NO<sub>2</sub> surrogate ref. gas is recommended as it is more practical to work with than O<sub>3</sub> gas.
- ix This specification is enhanced vs. the sensor mfg. spec based on GrayWolf data & long-term experience.
- x This 4-electrode smart NO<sub>2</sub> sensor has significantly reduced cross-sensitivity with O<sub>3</sub> vs 3-electrode sensors.
- xi This specification is reduced vs. the sensor mfg. lifetime spec based on GrayWolf data & long-term experience.

All specifications are subject to change without further notice.

**CA-GSXX**

Gas Calibration Kits. Specific calibration gases are available in various portable cylinder sizes.



**CA-HD4-A1**  
Calibration Cap

