



## enLink OAO

### LoRaWAN Wireless Outdoor Air Quality Monitor

#### Specifications

|                      |                                                                                     |
|----------------------|-------------------------------------------------------------------------------------|
| Frequency range      | 868 / 915 MHz*                                                                      |
| Protocol             | LoRaWAN®                                                                            |
| Receiver sensitivity | -135dBm @ 980bps                                                                    |
| RF Transmit power    | Up to +18dBm                                                                        |
| Antenna              | Integrated                                                                          |
| Certifications       | Pre-certified radio regulatory approvals: 868 & 915 MHz spectrum<br>CE, FCC<br>RoHS |
| Batteries            | 4 x AA sized 3.6V Lithium Thionyl Chloride. LS14500                                 |
| External Power       | 12-24V Volts DC. 0.15 Amp (max)                                                     |
| Processor            | ARM® Cortex® M0+                                                                    |
| Dimensions           | 180mm x 120mm x 51mm                                                                |
| Weight               | 300g Including batteries (depending on sensor options)                              |
| IP Rating            | IP42 (conformally coated electronics)                                               |
| Orientation          | Vertical wall mounting, North facing, in sheltered, shaded conditions               |
| Operating            | -10 – 40°C, 0 – 95%RH, Non-Condensing                                               |
| Case materials       | Nylon PA12                                                                          |



Temperature

Humidity

VOC's

Pressure

CO<sub>2</sub>

O<sub>3</sub>

Sound

Particles

EPA AQI

Plus 1 Gas

The enLink OAO Indoor Air Quality Monitor is a precision instrument which accurately measures up to ten key environmental parameters including Temperature, Relative Humidity, VOC's, Carbon Dioxide, Particulate Matter (PM1, PM 2.5, PM4 & PM10), Sound Level, Barometric Pressure, EPA Air Quality Index (AQI), Ozone, Formaldehyde, Carbon Monoxide, Nitrogen Dioxide, Hydrogen Sulphide, Sulphur Dioxide and Oxygen.

Readings are transmitted to the cloud using long range LoRa wireless, where the data can be displayed and analysed. A built in USB port allows all parameters including air quality data, wireless signal strength and wireless network configuration to be viewed and set using simple menus via any USB enabled host such as a PC or Mac.

#### Features

- Multiple sensor options\*
- LoRa long range wireless
- Frequency Range 863-870MHz\*
- Frequency Range 902-928MHz\*
- Up to +18dBm Tx Power
- Built in USB port for configuration
- Battery or externally powered
- CE / FCC compliant
- RoHS compliant
- Made in the UK

\*Model dependent

## OAQ Sensor Characteristics

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature                 | Accuracy: $\pm 0.2^{\circ}\text{C}$ (typical)<br>Repeatability: $\pm 0.1^{\circ}\text{C}$<br>Conversion time: 6.35ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Humidity                    | Accuracy: $\pm 2\%$ (typical)<br>Repeatability: $\pm 0.1\%$<br>Response time: 15s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| VOC's                       | IAQ Index 0 to 500 (see below)<br>TVOC level (ppm)<br>Variability $\pm 15\%$ (typical)<br>Response time: ( $\tau$ 33-63%) 1 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Pressure                    | Accuracy: $\pm 0.12\text{hPa}$ (equivalent to $\pm 1\text{m}$ in altitude)<br>Range (with full accuracy): 300 – 1100hPa<br>Resolution: 0.18Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Particulate Matter          | MCERTS Certified (PM2.5)<br>Particles measured: PM0.5, PM1, PM2.5, PM4 & PM10<br>Sensing method: Laser-based light scattering particle sensing<br>Concentration range: 0 – 1,000 $\mu\text{g}/\text{m}^3$<br>PM1, PM2.5<br>Accuracy: 0 $\mu\text{g}/\text{m}^3$ to 100 $\mu\text{g}/\text{m}^3 \pm 5 \mu\text{g}/\text{m}^3 +5\%$ m.v.<br>100 $\mu\text{g}/\text{m}^3$ to 1000 $\mu\text{g}/\text{m}^3 \pm 10\%$ m.v.<br><br>Accuracy: PM4, PM10<br>0 $\mu\text{g}/\text{m}^3$ to 100 $\mu\text{g}/\text{m}^3 \pm 25 \mu\text{g}/\text{m}^3$<br>100 $\mu\text{g}/\text{m}^3$ to 1000 $\mu\text{g}/\text{m}^3 \pm 25\%$ m.v.<br><br>Mass concentration resolution: 1 $\mu\text{g}/\text{m}^3$<br>Lower limit of detection: 0.3 $\mu\text{m}$<br>Response Time: < 6s ( $t_{90}$ )<br>Sensor life expectancy: > 3 years<br>Maintenance Interval: Keep vents clean. No additional maintenance required. |
| EPA Air Quality Index (AQI) | AQI Index 0 to 500 (see below)<br>Ozone detection 20 – 500 ppb<br>Nitrogen Dioxide Detection 20 – 500 ppb<br>Variability $\pm 50$ AQI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| CO <sub>2</sub> - Optional  | Sensing method: Optical. Non-dispersive infrared (NDIR)<br>Accuracy: $\pm(30, +3\%)$ ppm (typ.)<br>Range: 0 – 5,000 ppm<br>Extended range 0 – 10,000 ppm<br>Response time: 3 minutes ( $t_{90}$ )<br>Sensor life expectancy: >15 years<br>Maintenance Interval: No maintenance required<br>Built in Automatic Baseline Correction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Sound - Optional            | Sensitivity: -26dB FS $\pm 1\text{dB}$<br>SNR: 65dBA<br>Dynamic Range: 91dBA<br>Acoustic Overload Point: 120dB SPL<br>Total Harmonic Distortion: 0.2% (Typ.) @ 105dB SPL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Part Number | Temperature | Relative Humidity | VOC's | Barometric Pressure | EPA AQI | Particulates PM1, 2.5, 4, 10 |
|-------------|-------------|-------------------|-------|---------------------|---------|------------------------------|
| ENL-OAQ     | ●           | ●                 | ●     | ●                   | ●       | ●                            |

Order part number **ENL-OAQ** for base enLink OAQ model with the sensors listed in the table above.

The base enLink OAQ model can be enhanced with CO<sub>2</sub> (-C option), plus up to two additional gas sensors, if two sensors are fitted, one of these must be Ozone. Units may be specified with one additional gas sensor plus Ozone from the selection guide in the section below.

Example 1, to order the unit with an Ozone (0-2ppm) sensor the part number is:

**ENL-OAQ, AQS-O3-2**

Example 2, to order the unit with, CO<sub>2</sub>, Ozone (0-2ppm) and Nitrogen Dioxide (0-5ppm) sensors the part number is:

**ENL-OAQ-C, AQS-O3-2, AQS-NO2-5**

Example 3, to order the unit with Nitrogen Dioxide (0-5ppm) sensor the part number is:

**ENL-OAQ, AQS-NO2-5**

| Sensor Selection Guide |                            |            |       |                    |                         |                            |                    |
|------------------------|----------------------------|------------|-------|--------------------|-------------------------|----------------------------|--------------------|
| Parameter              | Type                       | Range      | Units | Part Number        | Calibration Certificate | Specific Gravity (SG) NTP* | Distribution       |
| °C                     | Temperature                | -40 - 85   | °C    | Fitted as standard | Factory Calibrated      |                            |                    |
| %RH                    | Humidity                   | 0 - 100    | %     | Fitted as standard | Factory Calibrated      |                            |                    |
| Pa                     | Pressure                   | 300 - 1100 | hPa   | Fitted as standard | Factory Calibrated      |                            |                    |
| PM                     | Particulate Matter         | 0 - 1,000  | µg/m3 | Fitted as standard | Factory Calibrated      |                            |                    |
| Sound                  | Decibels, A Weighted       | 91dBa      | dB(A) | Option -S          | --                      |                            |                    |
| VOC                    | Volatile Organic Compounds | 0 - 500    | IAQ   | Fitted as standard | Factory Calibrated      | 1                          | Evenly Distributed |
| CO <sub>2</sub>        | Carbon Dioxide             | 0 - 5000   | ppm   | Option -C          | Factory Calibrated      | 1.5189                     | Floor to Middle    |
| NH <sub>3</sub>        | Ammonia                    | 0 - 100    | ppm   | AQS-NH3-100        | ✓                       | 0.59                       | Ceiling / roof     |
| NH <sub>3</sub>        | Ammonia                    | 0 - 1000   | ppm   | AQS-NH3-1000       | ✓                       | 0.59                       | Ceiling / roof     |
| CO                     | Carbon Monoxide            | 0 - 10     | ppm   | AQS-CO-10          | ✓                       | 0.9667                     | Evenly Distributed |
| CO                     | Carbon Monoxide            | 0 - 100    | ppm   | AQS-CO-100         | ✓                       | 0.9667                     | Evenly Distributed |
| HCHO                   | Formaldehyde               | 0 - 1      | ppm   | AQS-HCHO-1         | ✓                       | 1.067                      | Evenly Distributed |
| HCHO                   | Formaldehyde               | 0 - 5      | ppm   | AQS-HCHO-5         | ✓                       | 1.067                      | Evenly Distributed |
| H <sub>2</sub> S       | Hydrogen Sulphide          | 0 - 50     | ppm   | AQS-H2S-50         | ✓                       | 1.1763                     | Floor to Middle    |
| NO <sub>2</sub>        | Nitrogen Dioxide           | 0 - 2      | ppm   | AQS-NO2-2          | ✓                       | 1.58                       | Floor to Middle    |
| NO <sub>2</sub>        | Nitrogen Dioxide           | 0 - 5      | ppm   | AQS-NO2-5          | ✓                       | 1.58                       | Floor to Middle    |
| O <sub>3</sub>         | Ozone                      | 0 - 2      | ppm   | AQS-O3-2           | ✓                       | 1.66                       | Floor to Middle    |
| SO <sub>2</sub>        | Sulphur Dioxide            | 0 - 5      | ppm   | AQS-SO2-5          | ✓                       | 2.264                      | Floor              |
| O <sub>2</sub>         | Oxygen                     | 0 - 25     | %     | AQS-O2-25          | ✓                       | 2.264                      | Floor              |

\*NTP - Normal Temperature and Pressure - is defined as 20°C (293.15K, 68°F) and 1 atm. ( 101.325 kN/m<sup>2</sup>, 101.325 kPa, 14.7 psia, 0 psig, 30 in Hg, 760 torr)

Sensors are grouped according to Specific Gravity (SG). Gas sensors should be used on the same enLink OAQ unit when the gases are Evenly Distributed and from the same SG band.

Examples:

Oxygen + Carbon Dioxide (Oxygen is evenly distributed and Carbon Dioxide is heavier than air.)

Oxygen + ~~Carbon Dioxide~~ + Ammonia. (Ammonia and Carbon Dioxide have different SG and therefore need to be in separate enLink Air units.)

Oxygen + Ammonia. (Oxygen is evenly distributed and Ammonia is lighter than air.)

(enLink OAQ must be mounted at the correct height for the gases to be measured).

## Performance Data

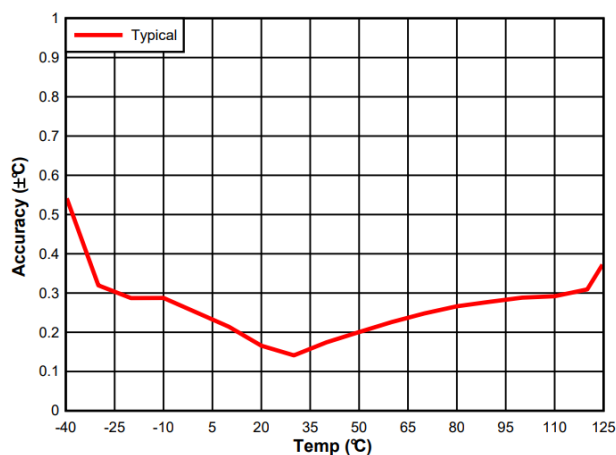
### Temperature (°C)

#### Features

- Factory calibrated
- High accuracy digital sensor
- Excellent stability at high humidity

#### Specifications

|                                    |                                  |
|------------------------------------|----------------------------------|
| Measurement:                       | Temperature °C                   |
| Operating Principle:               | Digital                          |
| Measurement Range (full accuracy): | 5°C to +60°C                     |
| Expected Operating Life:           | > 10 years                       |
| Long Term Sensitivity Drift:       | < 2% per month                   |
| Calibration:                       | Factory Calibrated               |
| Resolution:                        | 0.1°C                            |
| Accuracy (full range):             | ± 0.2°C                          |
| Temperature Range:                 | -20°C to +50°C                   |
| Humidity Range (non-condensing):   | 0 – 100 %RH                      |
| Response Time:                     | < 1 seconds                      |
| Storage Temperature:               | -65°C to +150°C                  |
| Orientation Sensitivity:           | None                             |
| Part Number:                       | Fitted as standard to enLink OAQ |



*Temperature Accuracy vs. Temperature*

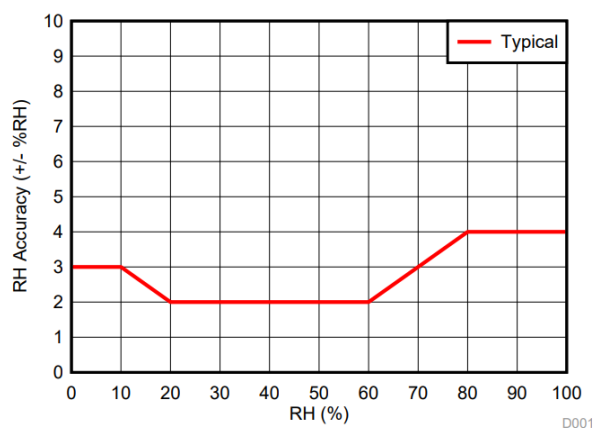
## Relative Humidity (%RH)

### Features

- Factory calibrated
- High accuracy digital sensor
- Excellent stability at high humidity

### Specifications

|                                    |                                  |
|------------------------------------|----------------------------------|
| Measurement:                       | Relative Humidity %RH            |
| Operating Principle:               | Digital                          |
| Measurement Range (full accuracy): | 0 – 100 %RH                      |
| Expected Operating Life:           | > 10 years                       |
| Long Term Sensitivity Drift:       | 0.25 %RH per year                |
| Calibration:                       | Factory Calibrated               |
| Resolution:                        | 0.1 %RH                          |
| Accuracy (full range):             | ± 2 %RH                          |
| Temperature Range:                 | -20°C to +70°C                   |
| Response Time:                     | < 1 seconds                      |
| Storage Temperature:               | -65°C to +150°C                  |
| Orientation Sensitivity:           | None                             |
| Part Number:                       | Fitted as standard to enLink OAQ |



*RH Accuracy vs. RH*

## Barometric Pressure (Pa)

### Features

- Factory calibrated
- High accuracy digital sensor

### Specifications

|                                    |                                                       |
|------------------------------------|-------------------------------------------------------|
| Measurement:                       | Barometric Pressure                                   |
| Operating Principle:               | Digital                                               |
| Measurement Range (full accuracy): | 300 – 1100 hPa                                        |
| Expected Operating Life:           | > 5 years                                             |
| Long Term stability:               | 1 hPa per year                                        |
| Calibration:                       | Factory Calibrated                                    |
| Resolution:                        | 0.18 hPa                                              |
| Accuracy (full range):             | ± 0.6 hPa                                             |
| Relative Accuracy                  | ± 0.12 hPa (equivalent to ±1m difference in altitude) |
| Temperature Range:                 | 0°C to +65°C                                          |
| Response Time:                     | < 10 seconds                                          |
| Storage Temperature:               | -45°C to +85°C                                        |
| Orientation Sensitivity:           | None                                                  |
| Part Number:                       | Fitted as standard to enLink OAQ                      |

## Particulate Matter PM0.5 to PM10

### Features

- MCERTS Certified
- Laser-based light scattering particle sensing
- Concentration range: 0 µg/m<sup>3</sup> to 1,000 µg/m<sup>3</sup>
- Fully calibrated
- Long life
- High reliability
- High resolution

### Specifications

|                                    |                                                 |                        |          |
|------------------------------------|-------------------------------------------------|------------------------|----------|
| Measurement:                       | Particulate Matter                              |                        |          |
| Operating Principle:               | Laser-based light scattering particle sensing   |                        |          |
| Measurement Range (full accuracy): | 0 – 1000 µg/m <sup>3</sup>                      |                        |          |
| Expected Operating Life:           | > 3 years                                       |                        |          |
| Calibration:                       | NA                                              |                        |          |
| Resolution:                        | 1 µg/m <sup>3</sup>                             |                        |          |
| Accuracy:                          | PM1, PM 2.5                                     |                        |          |
|                                    | 0 µg/m <sup>3</sup> to 100 µg/m <sup>3</sup>    | ± 5 µg/m <sup>3</sup>  | +5% m.v. |
|                                    | 100 µg/m <sup>3</sup> to 1000 µg/m <sup>3</sup> | ± 10 % m.v.            |          |
|                                    | PM4, PM 10                                      |                        |          |
|                                    | 0 µg/m <sup>3</sup> to 100 µg/m <sup>3</sup>    | ± 25 µg/m <sup>3</sup> |          |
|                                    | 100 µg/m <sup>3</sup> to 1000 µg/m <sup>3</sup> | ± 25 % m.v.            |          |
| Number concentration size range    | PM 0.5                                          | 0.3 - 0.5              | µm       |
|                                    | PM 1.0                                          | 0.3 – 1.0              | µm       |
|                                    | PM 2.5                                          | 0.3 – 2.5              | µm       |
|                                    | PM 4                                            | 0.3 – 4                | µm       |
|                                    | PM 10                                           | 0.3 - 10               | µm       |
| Temperature Range:                 | -10°C to +60°C                                  |                        |          |
| Humidity Range (non-condensing):   | 0 – 95% RH                                      |                        |          |
| Response Time (T90):               | < 6 seconds                                     |                        |          |
| Storage Temperature:               | -40°C to +70°C                                  |                        |          |
| Orientation Sensitivity:           | As per mounting instructions                    |                        |          |
| Part Number:                       | Fitted as standard to enLink OAQ                |                        |          |

The TPS reading from the sensor is the Typical Particle Size of the particulate matter in µm. It provides an indication on the average particle diameter in the sample aerosol. The output correlates with the weighted average of the number concentration bins measured with a TSI 3330 optical particle sizer. Lighter aerosols will have smaller TPS values than heavier aerosols. The reactivity of this output increases with the particle statistics: a larger number of particles in the environment will generate more rapidly meaningful TPS values than a smaller number of particles (i.e., clean air).

## Volatile Organic Compounds VOC's (IAQ)

### Features

- Factory calibrated
- Digital Indoor Air Quality sensor
- Tested to ISO16000-29 "Test methods for VOC detectors".

### Specifications

|                                    |                                  |
|------------------------------------|----------------------------------|
| Measurement:                       | Volatile Organic Compounds VOC's |
| Operating Principle:               | Metal Oxide Adsorption           |
| Measurement Range (full accuracy): | 0 – 500 IAQ                      |
| Expected Operating Life:           | >5 years                         |
| Calibration:                       | Factory Calibrated               |
| Resolution:                        | 1 IAQ                            |
| Accuracy:                          | ± 15% (typ.)                     |
| Temperature Range:                 | -40°C to +85°C                   |
| Humidity Range (non-condensing):   | 10 – 95% RH                      |
| Response Time:                     | < 2 seconds                      |
| Storage Temperature:               | -45°C to +85°C                   |
| Orientation Sensitivity:           | None                             |
| Part Number:                       | Fitted as standard to enLink OAQ |

## Indoor air quality (IAQ) classification and colour coding <sup>1</sup>

| IAQ Index              | Air Quality         | Impact (long-term exposure)                                             | Suggested action                                                                                                                       |
|------------------------|---------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 0 – 50                 | Excellent           | Pure air; best for wellbeing                                            | No measures needed                                                                                                                     |
| 51 – 100               | Good                | No irritation or impact on wellbeing                                    | No measures needed                                                                                                                     |
| 101 – 150              | Lightly polluted    | Reduction of wellbeing possible                                         | Ventilation suggested                                                                                                                  |
| 151 – 200              | Moderately polluted | More significant irritation possible                                    | Increase ventilation with clean air                                                                                                    |
| 201 – 250 <sup>1</sup> | Heavily polluted    | Exposition might lead to effects like headache depending on type of VOC | Optimise ventilation                                                                                                                   |
| 251 – 350              | Severely polluted   | More severe health issue possible if harmful VOC present                | Contamination should be identified if level is reached even without the presence of people; maximise ventilation and reduce attendance |
| > 351                  | Extremely polluted  | Headaches, additional neurotoxic effects possible                       | Contamination needs to be identified; avoid presence in room and maximise ventilation                                                  |

<sup>1</sup> According to the guidelines issued by the German Federal Environmental Agency, exceeding 25 mg/m<sup>3</sup> of total VOC leads to headaches and further neurotoxic impact on health.

<sup>2</sup>Software auto-calibrates the low and high concentrations applied during testing to IAQ of 25 and 250, respectively

Compliant to the ISO16000-29 standard “Test methods for VOC detectors”.

## bVOC mixture with Nitrogen as carrier gas

| Molar fraction | Compound                         | Certified accuracy |
|----------------|----------------------------------|--------------------|
| 5 ppm          | Ethane                           | 5 %                |
| 10 ppm         | Isoprene /2-methyl-1,3 Butadiene | 5 %                |
| 10 ppm         | Ethanol                          | 5 %                |
| 50 ppm         | Acetone                          | 5 %                |
| 15 ppm         | Carbon Monoxide                  | 2 %                |

## EPA Air Quality Index (AQI)

### Features

- Factory calibrated
- Digital Indoor Air Quality sensor
- Tested to ISO16000-29 "Test methods for VOC detectors".

### Specifications

|                                    |                                             |
|------------------------------------|---------------------------------------------|
| Measurement:                       | Ozone and Nitrogen Dioxide to determine AQI |
| Operating Principle:               | Metal Oxide Adsorption                      |
| Measurement Range (full accuracy): | 0 – 500 AQI                                 |
| Expected Operating Life:           | >5 years                                    |
| Calibration:                       | Factory Calibrated                          |
| Resolution:                        | 1 AQI                                       |
| Accuracy:                          | ± 50 AQI                                    |
| Temperature Range:                 | -40°C to +65°C                              |
| Humidity Range (non-condensing):   | 5 – 90% RH                                  |
| Response Time:                     | < 2 seconds                                 |
| Storage Temperature:               | -50°C to +125°C                             |
| Orientation Sensitivity:           | None                                        |
| Part Number:                       | Fitted as standard to enLink OAQ            |

## Outdoor air quality (AQI) classification and colour coding <sup>1</sup>

| AQI Index      | Levels of Concern              | Description of Air Quality                                                                                                                |
|----------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 0 – 50         | Good                           | Air quality is satisfactory, and air pollution poses little or no risk.                                                                   |
| 51 – 100       | Moderate                       | Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution. |
| 101 – 150      | Unhealthy for Sensitive Groups | Members of sensitive groups may experience health effects. The general public is less likely to be affected.                              |
| 151-200        | Unhealthy                      | Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects. |
| 201 – 300      | Very Unhealthy                 | Health alert: The risk of health effects is increased for everyone.                                                                       |
| 301 and higher | Hazardous                      | Health warning of emergency conditions: everyone is more likely to be affected.                                                           |

## What is the EPA Air Quality Index (AQI)?

The AQI is the United States of America Environmental Protection Agency's (EPA) index for reporting air quality.

### How does the AQI work?

Think of the AQI as a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern. For example, an AQI value of 50 or below represents good air quality, while an AQI value over 300 represents hazardous air quality.

For each pollutant an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health. AQI values at or below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.

The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific colour. The colour makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

## Carbon Dioxide (CO<sub>2</sub>)

### Features

- Advanced optical NDIR technology
- Long life due to non-depleting sensing principle
- Self-correcting for pressure and altitude variations
- High reliability
- High resolution
- Automatic Baseline Correction

### Specifications

|                                    |                                     |
|------------------------------------|-------------------------------------|
| Gas Detected:                      | Carbon Dioxide CO <sub>2</sub>      |
| Operating Principle:               | Non-dispersive infrared (NDIR)      |
| Measurement Range (full accuracy): | 0 – 5000 ppm                        |
| Expected Operating Life:           | > 15 years                          |
| Calibration:                       | Automatic baseline correction       |
| Resolution:                        | 0.1 ppm                             |
| Accuracy:                          | +/- (30, +3%) of reading, ppm       |
| Temperature Range:                 | 0°C to +50°C                        |
| Humidity Range (non-condensing):   | 0 – 95% RH                          |
| Response Time (T90):               | < 60 seconds                        |
| Storage Temperature:               | 0°C to +20°C                        |
| Orientation Sensitivity:           | None                                |
| Part Number:                       | -C (Optional sensor for enLink OAQ) |

## Ammonia (NH<sub>3</sub>)

### Features

- Liquid electrolyte
- Highly sensitive  
Combined with intelligent algorithms, has stronger adaptability to the environment, more accurate detection, and stable zero point

### Specifications

|                                    |                                            |          |
|------------------------------------|--------------------------------------------|----------|
| Gas Detected:                      | Ammonia NH <sub>3</sub>                    |          |
| Operating Principle:               | Liquid electrochemical sensing technology  |          |
| Measurement Range (full accuracy): | AQS-NH3-100                                | 100 ppm  |
|                                    | AQS-NH3-500                                | 500 ppm  |
|                                    | AQS-NH3-1000                               | 1000 ppm |
| Expected Operating Life:           | > 18 months                                |          |
| Calibration:                       | Manufacturer Calibration Certificate       |          |
| Resolution:                        | AQS-NH3-100                                | 0.1 ppm  |
|                                    | AQS-NH3-500                                | 0.1 ppm  |
|                                    | AQS-NH3-1000                               | 0.1 ppm  |
| Accuracy:                          | ± 5% Full Scale                            |          |
| Repeatability:                     | ≤ 2%                                       |          |
| Temperature Range:                 | -20°C to +40°C                             |          |
| Pressure Range:                    | 900 – 1100 mbar                            |          |
| Humidity Range (non-condensing):   | 15 – 95% RH                                |          |
| Response Time (T90):               | < 50 seconds                               |          |
| Storage Temperature:               | 0°C to +20°C                               |          |
| Orientation Sensitivity:           | None                                       |          |
| Part Number:                       | AQS-NH3-100<br>AQS-NH3-500<br>AQS-NH3-1000 |          |

## Carbon Monoxide (CO)

### Features

- Long life
- High reliability
- High resolution
- Combined with intelligent algorithms, has stronger adaptability to the environment, more accurate detection, and stable zero point

### Specifications

|                                    |                                                       |                                 |
|------------------------------------|-------------------------------------------------------|---------------------------------|
| Gas Detected:                      | Carbon Monoxide CO                                    |                                 |
| Operating Principle:               | Solid polymer electrochemical technology              |                                 |
| Measurement Range (full accuracy): | AQS-CO-10<br>AQS-CO-100                               | 0-10ppm<br>0-100ppm             |
| Lower Detection Limit:             | AQS-CO-10<br>AQS-CO-100                               | 0.1ppm<br>1ppm                  |
| Expected Operating Life:           | > 3 years (in relatively clean air, 0-25°C, 30-70%RH) |                                 |
| Calibration:                       | Manufacturer Calibration Certificate                  |                                 |
| Resolution:                        | AQS-CO-10<br>AQS-CO-100                               | 0.01 ppm<br>0.1ppm              |
| Accuracy:                          | AQS-CO-10                                             | 0-5ppm +/-2-5%<br>5-10ppm +/-5% |
|                                    | AQS-CO-100                                            | ±5% Full Scale                  |
| Repeatability:                     | ≤ 2%                                                  |                                 |
| Temperature Range:                 | -40°C to +50°C                                        |                                 |
| Pressure Range:                    | Atm. ± 10%                                            |                                 |
| Humidity Range (non-condensing):   | 15 – 95% RH                                           |                                 |
| Response Time (T90):               | < 30 seconds                                          |                                 |
| Storage Temperature:               | 0°C to +20°C                                          |                                 |
| Orientation Sensitivity:           | None                                                  |                                 |
| Part Number:                       | AQS-CO-10<br>AQS-CO-100                               |                                 |

## Formaldehyde (HCHO/CH<sub>2</sub>O)

### Features

- Long life
- High reliability
- High resolution
- Combined with intelligent algorithms, has stronger adaptability to the environment, more accurate detection, and stable zero point

### Specifications

|                                    |                                                       |                                                             |
|------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|
| Gas Detected:                      | Formaldehyde CH <sub>2</sub> O                        |                                                             |
| Operating Principle:               | Solid polymer electrochemical technology              |                                                             |
| Measurement Range (full accuracy): | AQS-HCHO-1<br>AQS-HCHO-5                              | 0 – 1 ppm<br>0 – 5 ppm                                      |
| Lower Detection Limit:             | 0.01ppm                                               |                                                             |
| Expected Operating Life:           | > 2 years (in relatively clean air, 0-25°C, 30-70%RH) |                                                             |
| Calibration:                       | Manufacturer Calibration Certificate                  |                                                             |
| Resolution:                        | 0.001ppm                                              |                                                             |
| Accuracy:                          | AQS-HCHO-1                                            | 100ppb-200ppb error is ±15%<br>200ppb-1000ppb error is ±10% |
|                                    | AQS-HCHO-5                                            | 0.1ppm-0.2ppm error is ±15%<br>0.2ppm-5ppm error is ±10%    |
| Repeatability:                     | ≤ 2%                                                  |                                                             |
| Temperature Range:                 | -40°C to +50°C                                        |                                                             |
| Humidity Range (non-condensing):   | 15 – 90% RH                                           |                                                             |
| Response Time (T50):               | < 40 seconds                                          |                                                             |
| Storage Temperature:               | 5°C to +20°C                                          |                                                             |
| Orientation Sensitivity:           | None                                                  |                                                             |
| Part Number:                       | AQS-HCHO-1<br>AQS-HCHO-5                              |                                                             |

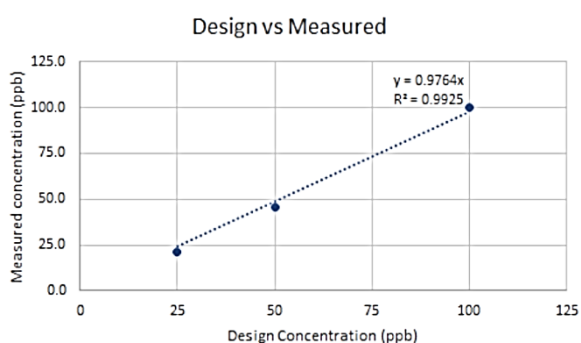
## Ozone (O<sub>3</sub>)

### Features

- Nano gas Sensor
- Long life
- High reliability
- High Sensitivity to single digit ppb

### Specifications

|                                  |                    |
|----------------------------------|--------------------|
| Gas Detected:                    | Ozone O3           |
| Operating Principle:             | Nano Gas Sensor    |
| Measurement Range:               | 0 – 2ppm           |
| Expected Operating Life:         | > 2 years          |
| Calibration:                     | Factory calibrated |
| Resolution:                      | 1ppb               |
| Accuracy (@100ppb):              | ±10% of reading    |
| Temperature Range:               | 5o°C to +65°C      |
| Humidity Range (non-condensing): | 5 – 99% RH         |
| Response Time (T90):             | < 10 seconds       |
| Storage Temperature:             | 0°C to +50°C       |
| Orientation Sensitivity:         | None               |
| Part Number:                     | AQS-O3-1           |



*Ozone Sensor percent error for Design versus Measured in laboratory environments show a 14.9% variance at 25 ppb; 8.5% variance at 50ppb and 0.1% variance at 100 ppb exposure.*

## Nitrogen Dioxide (NO<sub>2</sub>)

### Features

- Long life
- High reliability
- High resolution
- PPB level high-precision environmental monitoring
- Combined with intelligent algorithms, has stronger adaptability to the environment, more accurate detection, and stable zero point

### Specifications

|                                    |                                                       |                        |
|------------------------------------|-------------------------------------------------------|------------------------|
| Gas Detected:                      | Nitrogen Dioxide NO <sub>2</sub>                      |                        |
| Operating Principle:               | Solid Polymer Electrochemical Sensing Technology      |                        |
| Measurement Range (full accuracy): | AQS-NO2-2<br>AQS-NO2-5                                | 0 – 2 ppm<br>0 – 5 ppm |
| Expected Operating Life:           | > 2 years (in relatively clean air, 0-25°C, 30-70%RH) |                        |
| Calibration:                       | Manufacturer Calibration Certificate                  |                        |
| Resolution:                        | 0.001 ppm                                             |                        |
| Accuracy:                          | ±5% Full Scale                                        |                        |
| Lower Detection Limit:             | 0.05ppm                                               |                        |
| Temperature Range:                 | -40°C to +50°C                                        |                        |
| Humidity Range (non-condensing):   | 15 – 90% RH                                           |                        |
| Response Time (T90):               | < 50 seconds                                          |                        |
| Storage Temperature:               | 5°C to +20°C                                          |                        |
| Orientation Sensitivity:           | None                                                  |                        |
| Part Number:                       | AQS-NO2-2<br>AQS-NO2-5                                |                        |

## Oxygen (O<sub>2</sub>)

### Features

- Long life
- High reliability
- High resolution
- Combined with intelligent algorithms, has stronger adaptability to the environment, more accurate detection, and stable zero point

### Specifications

|                                  |                                          |
|----------------------------------|------------------------------------------|
| Gas Detected:                    | Oxygen O <sub>2</sub>                    |
| Operating Principle:             | Solid polymer electrochemical technology |
| Measurement Range:               | 0 – 25% O <sub>2</sub>                   |
| Expected Operating Life:         | > 2 years                                |
| Calibration:                     | Factory calibrated                       |
| Resolution:                      | 0.01%                                    |
| Accuracy:                        | ±5% Full Scale                           |
| Lower Detection Limit:           | 0.5% Vol.                                |
| Temperature Range:               | -40°C to +50°C                           |
| Pressure Range:                  | Atm. ±10%                                |
| Humidity Range (non-condensing): | 15 – 95% RH                              |
| Response Time (T90):             | < 10 seconds                             |
| Storage Temperature:             | 0°C to +40°C                             |
| Orientation Sensitivity:         | None                                     |
| Part Number:                     | AQS-O2-25                                |

## Battery Installation / Replacement

enLink OAQ devices use 4 x EVE ER14505 or SAFT LS14500 AA size 3.6 Volt Lithium Thionyl Chloride (Li-SOCl<sub>2</sub>) batteries (non-rechargeable) or direct equivalent.

No other batteries are approved for use in the device.

Lithium Thionyl Chloride batteries have very high energy capacity and must be used and handled with care observing the guidance below.



### WARNING

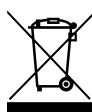
Risk of death or serious injury from explosion or fire.

- Keep out of sight and reach of children.
- Fire, explosion and burn hazard - do not recharge, short circuit, crush, disassemble, incinerate.
- Due to the high terminal voltage (3.6V), they are not suitable as direct replacements for other battery technologies in the same can sizes.
- When not in use the Batteries must be stored in a non-Hazardous Area.
- Do not change batteries in an explosive gas atmosphere.
- When installing batteries, do not snag the battery terminal on the clip or the battery may be damaged. Do not apply excessive force.
- Do not drop. Dropping the battery may cause damage. If a battery is dropped, do not install the dropped battery into the unit. Dispose of dropped battery promptly per local regulations or per the battery manufacturer's recommendations.

## Guidance

- Always install the batteries correctly as per instructions taking great care to observe the battery polarity.
- Ensure that the contact points are clean and conductive.
- All batteries must be the same model from the same manufacturer.
- Do not mix old and new batteries or batteries from different manufacturers.
- Do not heat or attempt to recharge the battery.
- Do not dispose of in a fire.
- Only install approved batteries: EVE ER14505 or SAFT LS14500 Lithium Thionyl Chloride AA Battery 3.6 Volt, or direct equivalent.

## Safe disposal



- Please recycle responsibly, a wide range of schemes are available.
- Do not dispose of in normal waste or in a fire.

Specifications are subject to change without notice