Sensor Datasheet

Model NAME: ATLASEN - AT04 (LEO)

Version 9

2021

atlasen

Indoor Environmental Quality

ATLASEN - AT04 Specifications

- Seamless real-time Indoor Environment Quality (IEQ) monitoring with accuracy and affordability. Invisible design.
- Maintenance-free for normal indoor applications.
- Professional Kit for WELL v.2 certification.
- The calibration is optional on a case-by-case basis.
  e.g. WELL Building Certification needs annual calibration report.

Index	Remark
Sensor Capacity	Real-time IEQ Measurements & Analysis Sensor Suite for WELL v2 continuous monitoring and data report.
Dimension	94 x 94 x 25 (mm)
Weight	126 g
Power Consumption	Less than 2 Watt (200 mA)
Operating Conditions	Temperature: 0 to 50 °C, Humidity: 0 to 95 %
Storage Conditions	Temperature: -20 to 70 °C, Humidity: 0 to 95 %
Power Supply	Input: AC 100 to 240 V, 50 to 60 Hz Output: 9V/12V DC Wall mount or 9V/12V 1.0A USB external power adapter
IoT Connectivity	Wi-Fi: Wi-Fi 802.11 b/g/n (2.4 GHz) Security: WPA/WPA2/WEP/TKIP/AES LoRaWAN, NB-IoT, Sigfox, BehrTech MYTHINGS, BACNet
Analyzing Tool	Restful, SOAP, SQL Server Support
Interval	Configurable, Default: 10/15 min.
System Requirement	Android 4.1 or later, iOS 8 or later atlasencontrol account
Approvals	FCC, KC, UL

Image 2: IEQ Analytic Dashboard (atlasencontrol.com)

Image 3: Mobile Application (Android and iOS support)

Sensor Component Datasheet & TEST Result

1. ATLASEN^TM LEO: Accuracy, Resolution & WELL Standard (v2)

Criteria	#	Sensor Type	Accuracy	Resolution	WELL V2
Thermal	1	Temperature	±0.5°C	0.1 °C	√
	2	Humidity	±3% RH	0.1 %	√
Air	3	CO_2	0.02% vol. CO2 ± 3% of reading, 50 ppm	1 ppm	√
	4	CO	1 ppm	0.1 ppm	√
	5	TVOC	18 µg/m³ (8 ppb) ±15%@150~2000 µg/m³	1 µg/m³	√
	6	PM1.0	5 µg/m³ ±10%@50~500µg/m³	1 µg/m³	-
	7	PM2.5	5 µg/m³ ±10%@50~500µg/m³	1 µg/m³	√
	8	PM10	5 µg/m³ ±10%@50~500µg/m³	1 µg/m³	√
	9	Ozone	10 ppb	1 ppb	√
	10	NO_2	10 ppb	1 ppb	√
	11	HCHO	10 ppb	1 ppb	√
	12	NH_3	10 ppb	1 ppb	-
Lighting	13	Illuminance	7 %, 25lux	0.1 lux	-
Acoustic	14	Noise Level	5 dB(A)	0.1 dB(A)	-
Spatial	15	PIR Motion Detector	-	On/Off	-

3. ATLASEN^{TM} LEO (AT04) IEQ Sensor: Datasheet

3.1 Temperature

	Category	Features
Sensor	Type	Digital
	Standard Range	- 40 to 125 °C
	Resolution	0.1 °C
	Accuracy	± 0.5 °C
	Response Time	< 2 sec. [1]
Instrument	Displayed Resolution	0.1 °C
	Warm Up Time @ Switch On	0.5 min. operational, 1 min. max accuracy
Environmental	Operating Temperature	- 40 to 125 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

[1] Temperature response times strongly depend on the type of heat exchange, the available sensor surface and the design environment of the sensor in the final application.

3.2 Relative Humidity (RH)

	Category	Features
Sensor	Type	Digital
	Standard Range	0 to 100 %
	Resolution	0.1 %
	Accuracy	± 3%
	Response Time	< 8 sec. [2]
Instrument	Displayed Resolution	0.1 %
	Warm Up Time @ Switch On	0.5 min. operational, 1 min. max accuracy
Environmental	Operating Temperature	- 40 to 125 °C
	Operating Humidity	0 to 100 %
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

[2] Humidity response time in the application depends on the design-in of the sensor.

3.3 Carbon Dioxide (CO_2)

	Category	Features
Sensor	Type	Non-dispersive infrared
	Standard Range	0 ppm to 20,000 ppm
	Resolution	1 ppm
	Accuracy	± 3% of reading 30 ppm (or 0.02% vol. CO_2)
	Long Term Drift [3]	± 50 ppm/month @ 20°C
	Response Time	< 20 sec
Instrument	Displayed Resolution	1 ppm
	Warm Up Time @ Switch On	2 min.
Environmental	Operating Temperature	0 to 50 °C
	Operating Humidity	0 to 85 %RH
	Operating Life (Estimated)	15 years +
WELL	WELL v2. Standard Fulfillment	Yes

[3] The long-term drift is stated as change of accuracy per year of operation.

3.4 Carbon Monoxide (CO)

	Category	Features
Sensor	Type	Digital
	Standard Range	1 to 1000 ppm
	Resolution	0.1 ppm
	Accuracy	1 ppm
	Response Time	T_{90} < 25 sec
Instrument	Displayed Resolution	0.1 ppm
	Warm Up Time @ Switch On	2 to 2.5 min.
Environmental	Operating Temperature	- 4 °C to 50 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	10 years
WELL	WELL v2. Standard Fulfillment	Yes

3.5 Total Volatile Organic Compound (TVOC)

	Category	Features
Sensor	Type	Digital
	Standard Range	0 ppb to 60000 ppb
	Resolution	1 µg/m³
	Accuracy	18 µg/m³ (8 ppb) typ. 15% of meas. Value
	Response Time	< 3 seconds
Instrument	Displayed Resolution	1 µg/m³
	Warm Up Time @ Switch On	2 - 2.5 min (instrument warm up delay time)
Environmental	Operating Temperature	- 40 to 125 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

3.6 Particulate Matter (PM 1.0)

	Category	Features
Sensor	Type	Digital
	Standard Range	0.3 - 1.0 µm
	Resolution	1 µg/m³
	Accuracy	5 µg/m³ ±10%@50~500µg/m³
	Response Time	Single < 1 sec. Total response time ≤ 10 sec.
Instrument	Displayed Resolution	1 µg/m³
	Warm Up Time @ Switch On	2 - 2.5 min.
Environmental	Operating Temperature	-10 to 60 °C
	Operating Humidity	0 to 99 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	-

3.7 Particulate Matter (PM 2.5)

	Category	Features
Sensor	Type	Digital
	Standard Range	1.0 - 2.5 μm
	Resolution	1 μg/m3
	Accuracy	5 μg/m³ ±10%@50~500μg/m³
	Response Time	Single ≤ 1 sec. Total response time ≤ 10 sec.
Instrument	Displayed Resolution	1 μg/m3
	Warm Up Time @ Switch On	2 - 2.5 min.
Environmental	Operating Temperature	-10 to 60 °C
	Operating Humidity	0 to 99 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

3.8 Particulate Matter (PM 10)

	Category	Features
Sensor	Type	Digital
	Standard Range	2.5 - 10 μm
	Resolution	1 μg/m³
	Accuracy[3]	5 μg/m³ ±10%@50~500μg/m³
	Response Time	Single < 1 sec. Total response time ≤ 10 sec.
Instrument	Displayed Resolution	1 μg/m3
	Warm Up Time @ Switch On	2 - 2.5 min.
Environmental	Operating Temperature	-10 to 60 °C
	Operating Humidity	0 to 99 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

3.9 Ozone (O₃)

	Category	Features
Sensor	Type	Electrochemical
	Standard Range	0 to 20 ppm
	Resolution	1 ppb
	Accuracy	5 ppb
	Response Time	< 15 sec.
Instrument	Displayed Resolution	0.1 ppb
	Warm Up Time @ Switch On	2 - 2.5 min.
Environmental	Operating Temperature	- 30 to 40 °C
	Operating Humidity	15 to 90 %RH
	Operating Life (Estimated)	10 years
WELL	WELL v2. Standard Fulfillment	Yes

3.10 NO₂

	Category	Features
Sensor	Type	Digital
	Standard Range	0.05 to 10 ppm
	Resolution	1 ppb
	Accuracy	10 ppb
	Response Time	T_{90} <25 sec.
Instrument	Displayed Resolution	0.1 ppb
	Warm Up Time @ Switch On	2 to 2.5 min.
Environmental	Operating Temperature	- 40 to 50 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	10 years
WELL	WELL v2. Standard Fulfillment	Yes

3.11 Formaldehyde (HCHO)

	Category	Features
Sensor	Type	Electrochemical
	Standard Range	0 to 10 ppm
	Resolution	1 ppb
	Accuracy	10 ppb
	Long Term Drift	<2% signal loss/month
	Response Time	T_{90} <80 sec.
Instrument	Displayed Resolution	0.1 ppb
	Warm Up Time @ Switch On	2 to 2.5 min
Environmental	Operating Temperature	0 to 50 °C
	Operating Humidity	15 to 90 %RH
	Operating Life (Estimated)	5 years +
WELL	WELL v2. Standard Fulfillment	Yes

3.12 Ammonia (NH$_3$)

	Category	Features
Sensor	Type	Digital
	Standard Range	1 to 300 ppm
	Resolution	1 ppb
	Accuracy	10 ppb
	Long Term Drift	n/a
	Response Time	T_{90} <25 sec.
Instrument	Displayed Resolution	0.1 ppb
	Warm Up Time @ Switch On	2 to 2.5 min.
Environmental	Operating Temperature	- 40 to 50 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	10 years
WELL	WELL v2. Standard Fulfillment	-

3.13 Illuminance

	Category	Features
Sensor	Type	Digital
	Standard Range	0.1 to 40,000 lux
	Resolution	0.1 lux
	Accuracy	7 %, 25 lux
	Long Term Drift	n/a
	Response Time	2 to 2.5 min.
Instrument	Displayed Resolution	0.1 lux
	Warm Up Time @ Switch On	2 to 3 min.
Environmental	Operating Temperature	-30 to 80 °C
	Operating Humidity	0 to 100 %RH
	Operating Life (Estimated)	5 years
WELL	WELL v2. Standard Fulfillment	-

3.14 Noise

	Category	Features
Sensor	Type	Digital
	Standard Range	30 to 100 dB
	Resolution	0.1 dBA
	Accuracy	5 dBA
	Long Term Drift	n/a
	Response Time	2 to 2.5 min
Instrument	Displayed Resolution	0.1 dBA
	Warm Up Time @ Switch On	2 to 3 min
Environmental	Operating Temperature	-40 to 85 °C
	Operating Humidity	n/a
	Operating Life (Estimated)	5 years
WELL	WELL v2. Standard Fulfillment	-

3.15 PIR Motion Detector

	Category	Features
Sensor	Type	Pyroelectric Infrared Radial
	IR Receiving Electrode	2×1 mm, 2 elements
	Window Size	4×3 mm
	Spectral Response	5-14 µm
	Transmittance	≥ 75%
	Sensitivity	≥ 3300 V/W
	Detectivity	$\geq 1.4 \times 10^8 cmHz^{1/2}/W$
Instrument	Displayed Resolution	On/Off
	Warm Up Time @ Switch On	2 to 3 min
Environmental	Operating Temperature	-30 to 70 °C
	Storage Temperature Humidity	-40 to 80 °C
	Operating Life (Estimated)	5 years
WELL	WELL v2. Standard Fulfillment	n/a

4. Recommendations for sensors

4.1 Installation

4.1.1 Wall-mounting procedure

1. Attach the bracket to the wall by screwing the supplied metal screws into the plastic anchors.

2. Tighten the screws firmly to the wall.

3. Thread the wires through the back of the backplate.

4. Put the sensor body in the bracket and fix it. Press firmly until it snaps.

5. Install the mobile app on your phone and register atlasenLEO.

4.1.2 Suitable conditions

- In areas that are most meaningful in terms of indoor air quality.

- Inside the room, in which you want to monitor indoor environmental condition.

- At a height of about 1.1 to 1.7 m at ground level on the interior walls.

- Mount sensors in rooms at a distance of at least 0.5 m from the nearest wall.

- At least 1 m from the corner.

- At least 0.5 to 1. m from the door.

- In places where the temperature is in the range of about 10 to 40 ° C.

- In places where is level surface.

- In places where children can't reach.

- On a wall, where is reachable to outlet.

- Minimum one sensor per floor or one every 100 m^2, whichever is more stringent, is recommended (WELL V2 requirement: one per 325 m^2).
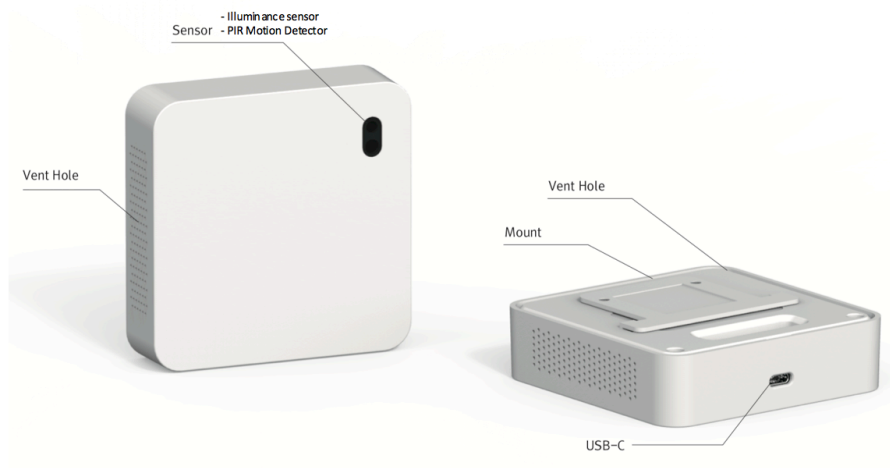
4.1.3 Conditions to avoid

- Outdoor or condensed environments

- Alcoves or on shelves

- In places subject to sudden changes of temperature

- In places near to air flows and heat sources

- In places where come about condensation of humidity

- In places where risk of splashing sensor by different liquids

- In places where risk of falling sensor by vibration or shaking

- In places where is exposed to direct sunlight, and corrosive gases

- In places where explosive gasses are present

- In places where covered with curtains

- In places close to radiators or electromagnetic fields

4.2 Management

- Measurements are taken at intervals of no longer than 10 minutes for particulate matter and carbon dioxide and no longer than one hour for other pollutants.

- Data are analyzed for regularly occupied hours (e.g., median, mean).

- Sensors are recalibrated or replaced annually for best performance (recommended), with documentation attest to their calibration or replacement submitted annually.

- Be aware that all measurement points must be representative of typical occupied areas within the sampling zone.

- Be aware that the floor that is identified for measurements must be regularly used by a representative sample of the occupants.

- Be aware that electronics are sensitive to static electricity, so aim to discharge before touching, and avoid touching any components inside the device.

- Do not paint the sensor.

4. Sensor Installation

Desk Type Installation: 9V/12V Adapter

Sensor - Illuminance sensor
- PIR Motion Detector

Vent Hole

Vent Hole

Mount

USB-C

Vent Hole

Wall fixing hole

Label

USB-C / MINI USB

3M Tape

Vent Hole

LED

5. Sensor Images: Logo Customization (Example)

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Indoor Environmental Quality

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