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Awair indoor air quality solution

- Awair has provided school campuses and commercial offices around the world with a scalable indoor air quality solutions since 2013.
- The solution includes sensors that measure CO2 and PM2.5 among other IAQ components. (More detail specs attached)
- Its web-based Dashboard is a great tool to manage devices in classrooms and schools in multiple locations, set up notifications for various teams, pull reports & analytics, and archive historical data.
- The Dashboard is subscription-based but the sensor itself can work without the subscription - the sensors show real-time IAQ data through an on-device display, coupled with mobile app (iOS, Android)
- List price for a WiFi version of Awair Omni is US\$499 and the yearly subscription for each sensor with unlimited number of users is \$75. Typically, each sensor can cover up to 1~2K sqft of an open space. Bulk discount is available.
- Awair was founded in Cupertino and its current HQ is located in San Francisco.

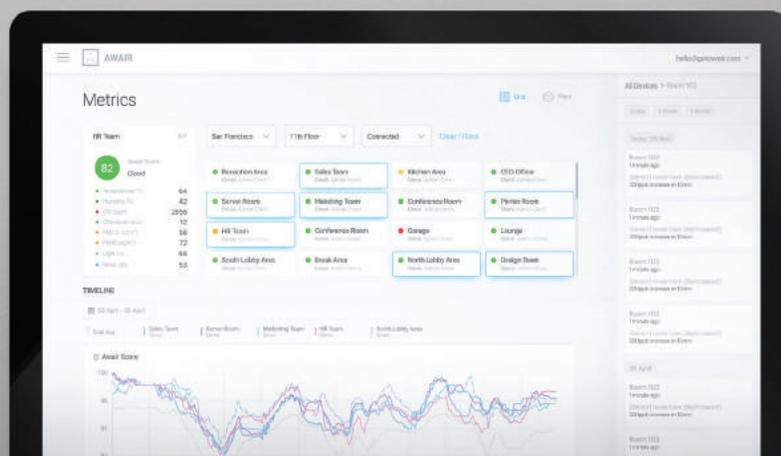
Additional submitted attachment is included below.

AWAIR® Omni™

Enterprise Essentials

REBUILDING TRUST AND SAFETY IN A POST-COVID WORLD

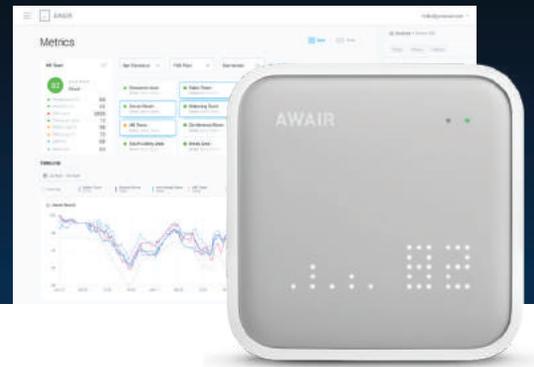
How do you get your colleagues and customers back to your place of work, building, or business? Truth is, indoor air quality and monitoring are an essential component of a post-Covid re-entry strategy, as well as indispensable to health and safety.



Awair Omni's sensors monitor seven key factors that influence the well-being of your occupants: VOCs, PM.2, CO2, humidity, temperature, light, and noise. Awair's software also lets you know the moment your air quality becomes unhealthy and provides the data and insights you need to create a productive, healthier, and safer environment.

In this document, you'll find a comprehensive overview of how Omni operates as well as how Awair's indoor air monitoring system can be used to help mitigate the spread of SARS-COV-2, the virus that causes COVID-19. To discuss how Awair can help your organization achieve your goals, reach out to us at business@getawair.com.

Rebuilding Trust and Safety in a Post-Covid World



How does the Awair Omni Indoor Air Quality Monitoring system help you rebuild trust and ensure the safety of your environment?



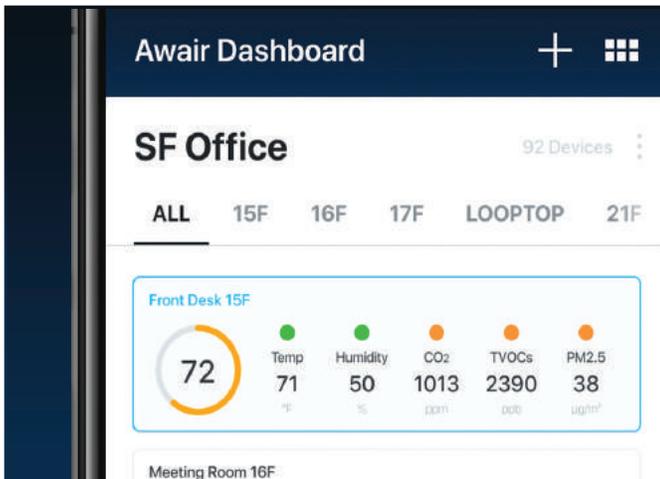
Reassure

Trust is built on transparency - How do your customers and colleagues know the air they are breathing in your place of business is clean? How do they know your social distance protocols are working? How do they know the disinfectants sprayed are not causing a secondary health hazard? The Answer is *Awair Omni*. *Omni* measures seven IAQ metrics essential to health and social distance protocols and provides a highly visible, easy to understand *Awair score* (1-100).

Remediate

Respiratory health hazards are serious, but the remediation solutions are simple and easy... if you know your air.

- **CO2** above 1000 ppm means too many people are in a room or poor ventilation is causing a SARS-COV-2 virus transmission hazard. Action - clear the room, enforce stricter social distance protocols, turn on fans, ventilators, and circulate air.
- **PM2.5** above 35 $\mu\text{g}/\text{m}^3$ means particles from dust or other allergens are creating a respiratory health risk. Action - turn on/up air purifiers, be cautious ventilating from outside if the AQI is bad.
- **VOCs** can spike upwards from cleaning solutions or other contaminants. Action - clear the area, ensure cleaning crews use green cleaning products, turn on air purifiers, fans, and ventilators.



Rebuild

Trust and safety are essential for any organization, building manager, or people leader charged with getting colleagues and customers back - and back to normal. *Omni's* intuitive data dashboard, APIs and connectivity solutions provide actionable insight to manage IAQ and work environments continuously and cost effectively. Easily installed, integrated and managed, *Omni* is an essential tool for keeping your employees or occupants safer in advance of a vaccine for COVID-19 and the next phases of adjustment due to the pandemic.

HVAC Remediation System Checklist

- Check and replace all filters on a timely basis
- Clean grills and dispose of used filters safely
- Choose the best-rated filter compatible with your system (MERV 13 or higher recommended)
- Maintain a relative humidity (RH) of 40-60%
- Ensure dampers and exhaust fans are working properly
- Monitor indoor air quality real-time so adjustments can be made as needed

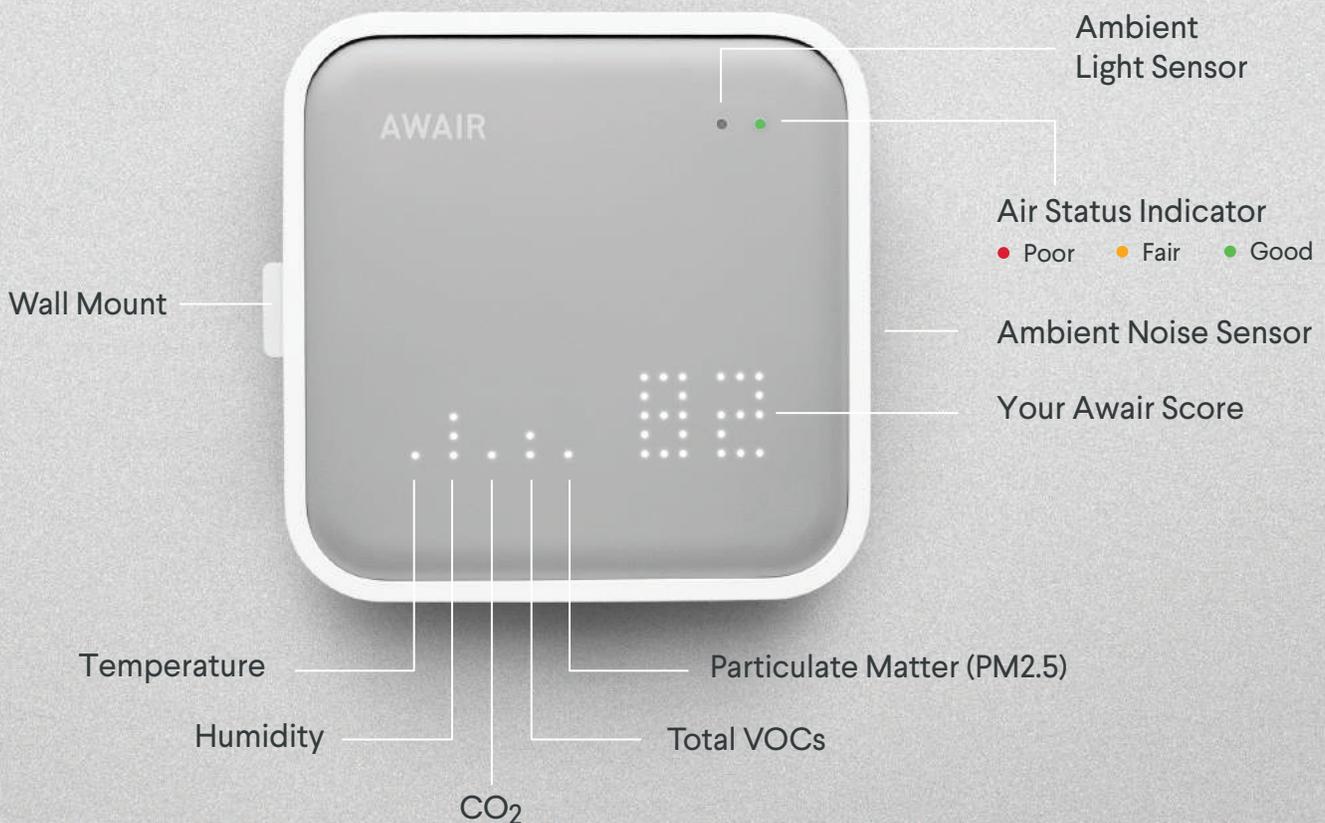
Awair Score and Indices

Omni uses the “Awair Score” to help you understand your air quality at a glance. The Awair Score is a color-coded and numbered scale, with zero representing poor air quality and 100 indicating healthy indoor air. Omni’s LED display shows a colored indicator based on your Awair Score: green indicates healthy air quality, yellow indicates fair, and red indicates poor.

The Awair Score is calculated by compiling aggregate measurements from seven different sensors: temperature, relative humidity, carbon dioxide (CO₂), total VOCs, particulate matter (PM_{2.5}), light, and noise. The air quality index for each sensor uses a scale from one to five to help you determine whether or not each factor is healthy.

Temperature, relative humidity, carbon dioxide, total VOCs, and particulate matter levels are represented on the device as five sequential dots. A single dot represents healthy air quality levels for the factor in question, whereas a column of two or more dots indicates that this factor is reaching unhealthy levels. The fewer dots that appear on your device, the healthier your air. Because light and noise levels are more immediately apparent to our sense, these factors are not displayed on the device but are still monitored and tracked within the Omni dashboard.

Awair’s indices were uniquely developed to fit indoor air quality needs. Awair aggregated AQI information from some of the most trusted environmental and worker safety organizations, including the Environmental Protection Agency (EPA), the World Health Organization (WHO), the Occupational Safety and Health Administration (OSHA), the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), and more.



Rebuilding Trust and Safety in a Post-Covid World



Whether you realize it or not, air quality directly impacts your bottom line. Maintaining a healthy indoor environment can increase property value, promote energy savings, and improve the productivity of building occupants.

Real Results

Strengthen Property Value

Earn an additional 25 percent return on your real estate investments and charge premiums for wellness-certified spaces.

The [Global Wellness Institute](#) estimates that real estate assets focused on wellness are currently achieving price premiums up to 25 percent higher than standard assets. Additionally, research performed by [UKGBC and JLL](#) demonstrated that wellness certified assets outperformed non-certified assets by more than 100 percent.

Boost Building Efficiency

Improve your air quality and drive energy savings.

The [World Green Building Council](#) noted that adjusting HVAC controls to enhance air quality and human health resulted in up to 79 percent energy savings. Many spaces unknowingly air condition when outdoor ventilation is sufficient. Omni can help you determine when mixed-mode and natural ventilation methods are healthy alternatives to drive energy savings.

Improve Performance

Employee productivity and cognitive ability can increase by up to 50 percent for both open and closed floor plans.

A Harvard T.H. Chan School of Public Health [study](#) found that decreasing office carbon dioxide levels from typical conditions of 1,400 ppm to Awair Recommended Levels (< 600.5 ppm) caused a 50 percent increase in employee scores on cognitive function tests.

Indoor noise, temperature, humidity, and light levels also affect workplace health and productivity. According to a [Cornell University study](#), unhealthy office noise decreased employee performance on tasks requiring reading comprehension and memory and reduced overall job satisfaction.

Build Brand Equity and Trust

Improve your brand image and promote positive change.

Investing in the health of your building and your clients will help you set yourself apart from competitors, create positive brand awareness, and foster trust in your company.

Increase Cost Savings

Save up to \$15,500 per employee per year.

A 2015 [joint study](#) between Harvard T.H. Chan School of Public Health and United Technologies Climate, Controls & Security found a strong correlation between air quality and productivity. The study tested employee performance in environments with “healthy” and “unhealthy” air. In healthy air conditions, performance improvements equated to \$15,500 in additional revenue per employee per year.

Increase Employee Attendance

Lower absence rates by 35 percent by maintaining a healthy and safe environment.

A [report](#) released by the World Green Building Council found that workplaces with healthy indoor air experience 35% fewer absences from short-term sick leave. They suggest maintaining carbon dioxide levels of less than 600 ppm (Awair’s Recommended Standard) to ensure adequate ventilation.

Boost Health and Wellbeing

Reduce your risk of infection and disease.

“[Sick Building Syndrome](#)” refers to a variety of adverse health symptoms that people experience while living or working in a building with poor air quality. In addition to causing discomfort, these symptoms can exacerbate existing conditions and lead to [long-term health consequences](#).

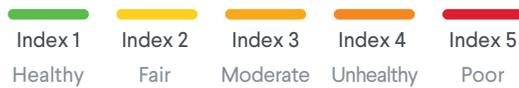
Another [study](#) by the American Society of Interior Designers revealed that inadequate workplace temperature and lighting altered the circadian rhythm of tenants — affecting their energy, sleep quality, and well being. By monitoring your indoor air quality and maintaining a healthier indoor environment, you’ll alleviate symptoms and improve health outcomes.

Additional Benefits

- The wellness trend is causing more real-estate clients, homeowners, and employees to expect healthier, certified spaces.
- Use Awair Omni to earn your WELL, Fitwel, RESET™, BREEAM, LEED, and Living Building Challenge certifications.
- Be at the forefront of the sensing technology trend to differentiate your brand from competitors and foster trust.

Omni Sensors

Awair's 5 Indices



Relative Humidity

Humidity has a [significant impact](#) on comfort, respiratory health, and productivity. Humidity levels between 40 and 50 percent are considered optimal. This range is recommended especially for those with allergies, asthma, or other respiratory illnesses. Maintaining humidity within this range can also minimize the growth and spread of mold, viruses, and bacteria.



Total VOCs

Volatile Organic Compounds (VOCs) are a diverse group of toxic chemicals that are commonly found in the air in homes and offices. They are both naturally occurring and man made. VOCs can be found in most manufactured goods as well as common cleaners, paint, upholstery, sealants, and pressed wood. Unlike other chemicals in the air, VOCs are generally measured as a group because of their cumulative effect on health and comfort.

VOCs can have a wide range of health effects. Moderate levels of exposure can cause headaches, fatigue, allergic skin reactions, eye and throat irritation, and other symptoms that can affect comfort, concentration, and productivity. Higher concentrations have been associated with more severe health consequences such as cognitive impairment, overworked liver and kidneys, and even cancer. It's important to try to minimize the amount of VOCs in your environment and maintain levels under 333 parts per billion (ppb).



Light

The amount of light we're exposed to during the day influences our productivity and health. A [study](#) of indoor office environments found that maintaining optimal light levels of around 1000 lux improved employee performance and well being. For workplace [task lighting](#), the recommended range is between 300 and 500 lux.

For residential environments, increasing light exposure during the daytime and [decreasing light levels during the evening](#) can improve alertness and lead to better sleep quality. Omni tracks light levels in your space and can give you the insight you need to create a healthier environment.



Temperature

The temperature index is designed to help you maximize occupant comfort and productivity. Index one, the optimal index, spans a range of 18 to 25°C (64.4 to 77°F). An indoor temperature either above or below this range can adversely affect occupant comfort and productivity. Temperature fluctuations outside of this healthy range will bring your temperature reading into a higher index and decrease your overall Awair Score.



Carbon Dioxide (CO₂)

Carbon dioxide (CO₂) is an important consideration when it comes to health and productivity. Breathing high levels of CO₂ can cause difficulty concentrating, decreased cognitive ability, fatigue, and in extreme instances, asphyxia. Typically, outdoor CO₂ levels are around 400 parts per million (ppm), therefore the lowest achievable indoor CO₂ level is around 400 ppm. Concentrations below 600 ppm are considered ideal for a healthy and productive environment.



Particulate Matter (PM_{2.5})

[PM_{2.5}](#) refers to particulate matter with a diameter of 2.5 microns or smaller. Particles that are less than 2.5 microns in diameter are able to permeate membranous tissue and travel deep into the respiratory tract and bloodstream. This can cause irritation, increase your risk of infection, worsen existing respiratory conditions, and lead to serious diseases such as Chronic Obstructive Pulmonary Disease (COPD) and lung cancer.

Minimizing indoor fine dust levels is essential for healthy air quality. To protect your health, we suggest keeping dust levels below 15 micrograms per cubic meter (µg/m³).



Noise

In the United States alone, [30 million people](#) are exposed to hazardous sound levels at work. A "hazardous noise," as defined by the National Institute for Occupational Safety and Health (NIOSH), is any sound that exceeds 85 dB(A) (a weighted average of noise exposure over a standard 8-hour work period). Although a little background noise can help drown out distractions, too much noise can cause stress and [impede productivity](#). For indoor environments, optimal background noise levels are around 45 dB(A). Foreground (transient) noise levels should remain below 85 dB(A) so as not to interrupt concentration or trigger alarm.

In residential settings, limiting the amount of indoor noise pollution occupants are exposed to can create a sense of privacy and comfort. In addition, noisy indoor environments are typically valued lower (and are less desirable) than environments with healthy noise levels. Omni tracks noise levels in your space and can give you insight into how indoor activities or sound sources are affecting the health and productivity of your space.

Omni Tech Specs

SENSORS, RANGE, AND ACCURACY															
Temperature <ul style="list-style-type: none"> Complementary metal-oxide-semiconductor (CMOS) sensor Range: -40 to 125°C (-40 to 257°F) Accuracy: ±0.2°C Selectable °F or °C display 	Total Volatile Organic Compounds (VOCs) <ul style="list-style-type: none"> Multi-pixel metal oxide gas sensor VOC Range: 0-60 ppm Accuracy: ±10%* 														
Relative Humidity <ul style="list-style-type: none"> CMOS sensor Range: 0-100% RH Accuracy: ±2% RH 	Particulate Matter (PM2.5) <ul style="list-style-type: none"> Laser-based light scattering sensor PM 2.5 Range: 0-1,000 µg/m³ Accuracy: ±15% or ±15 µg/m³ 														
Carbon Dioxide (CO₂) <ul style="list-style-type: none"> NDIR (Non Dispersive Infrared Sensor) Range: 400-5,000 ppm Accuracy: ±75 ppm or 10% of reading 	Ambient Light <ul style="list-style-type: none"> Range: 0.96 to 64,000 Lux 														
	Ambient Noise <ul style="list-style-type: none"> Sensitivity: -26 dBFS Signal to Noise Ratio: 61.5 dB(A) 														
SYSTEM REQUIREMENTS <ul style="list-style-type: none"> Wi-Fi Connection For Device Setup: <ul style="list-style-type: none"> Smartphone or tablet with support for Bluetooth 4.0 		DIMENSIONS <ul style="list-style-type: none"> Width: 3.85 Inch (98mm) Height: 3.85 Inch (98mm) Depth: 1.35 Inch (34mm) 	WEIGHT 220g (0.49 lbs)												
WIRELESS Wi-Fi connection: 802.11 b/g/n @ 2.4GHz (single stream) Supported Wireless Security: WPA, WPA2 Bluetooth 4.1 @ 2.4GHz		BATTERY Rechargeable Lithium-Ion Battery Capacity and voltage: 2250mAh @ 3.7V 5.5 - 9 hours (depending on settings)													
DATA CONNECTIVITY OPTIONS <ul style="list-style-type: none"> BACnet MS/TP BACnet over IP Ethernet (WAN and/or LAN) Cellular (LoRa Gateway) Wifi (2.4GHz) 		DISPLAY MODES Selectable via touch screen or Awair App. Pressing the power button will cycle through all display modes. <table border="0"> <tr> <td>• Awair Score</td> <td>• Temperature</td> <td>• Humidity</td> <td>• CO₂</td> </tr> <tr> <td>• Total VOCs</td> <td>• PM2.5</td> <td>• Time</td> <td>• No Display</td> </tr> </table>		• Awair Score	• Temperature	• Humidity	• CO ₂	• Total VOCs	• PM2.5	• Time	• No Display				
• Awair Score	• Temperature	• Humidity	• CO ₂												
• Total VOCs	• PM2.5	• Time	• No Display												
POWER Input: 100~240V AC, 50/60Hz USB-C Output: 5V/2.0A		CERTIFICATIONS <table border="0"> <tr> <td>Environmental:</td> <td colspan="3">ROHS, REACH, WEEE</td> </tr> <tr> <td>Consumer</td> <td>US: FCC</td> <td>Korea: KCC</td> <td>Europe: CE</td> </tr> <tr> <td>Electronic Safety:</td> <td>China: SRRC</td> <td>Japan: Telec</td> <td></td> </tr> </table>		Environmental:	ROHS, REACH, WEEE			Consumer	US: FCC	Korea: KCC	Europe: CE	Electronic Safety:	China: SRRC	Japan: Telec	
Environmental:	ROHS, REACH, WEEE														
Consumer	US: FCC	Korea: KCC	Europe: CE												
Electronic Safety:	China: SRRC	Japan: Telec													
POWER CONSUMPTION With Battery Charging: Max 6.5W Operating: Avg 1.76W (Max 2.6W) Total: Less than 1.3kWh per Month (operating for 30 days)		WARRANTY One year													
		DURABILITY Drop Tested at 1.5m (4.9 ft)													

*Accuracy is calculated using a reference gas with an H₂ concentration of 0.5 ppm.

Placement Guidelines

A. Device should be centrally-located within the monitored space.

B. Device should be placed within the “breathing zone:” between 90 centimeters to 1.8 meters, or three to six feet from the ground (after finished floor to underside of finished ceiling).

C. Device should be located at least five meters (16 feet) away from operable windows. In areas where this is not possible, monitors must be located no closer to windows than half the width of the space, measured linearly from the windows inwards.

D. Device should be placed at least five meters (16 feet) away from air filters and fresh air diffusers. In areas where this is not possible, monitors must be located closer to air returns than air diffusers.



Maximum
Installation Height

6ft
1.8m

From the ground
to the center of the
Omni device.



Minimum
Installation Height

3ft
90cm



Security and Data Policy

Security

Awair's proprietary Cosmo Platform is used for communication between Omni and Awair's servers. Awair's Cosmo Platform is TRUSTe certified. Cosmo employs 128-bit AES encryption to protect data packets traveling between devices and the Cosmo Cloud. The flexible AES key management system is capable of supporting numerous encryption key exchange rules.

Data Collection

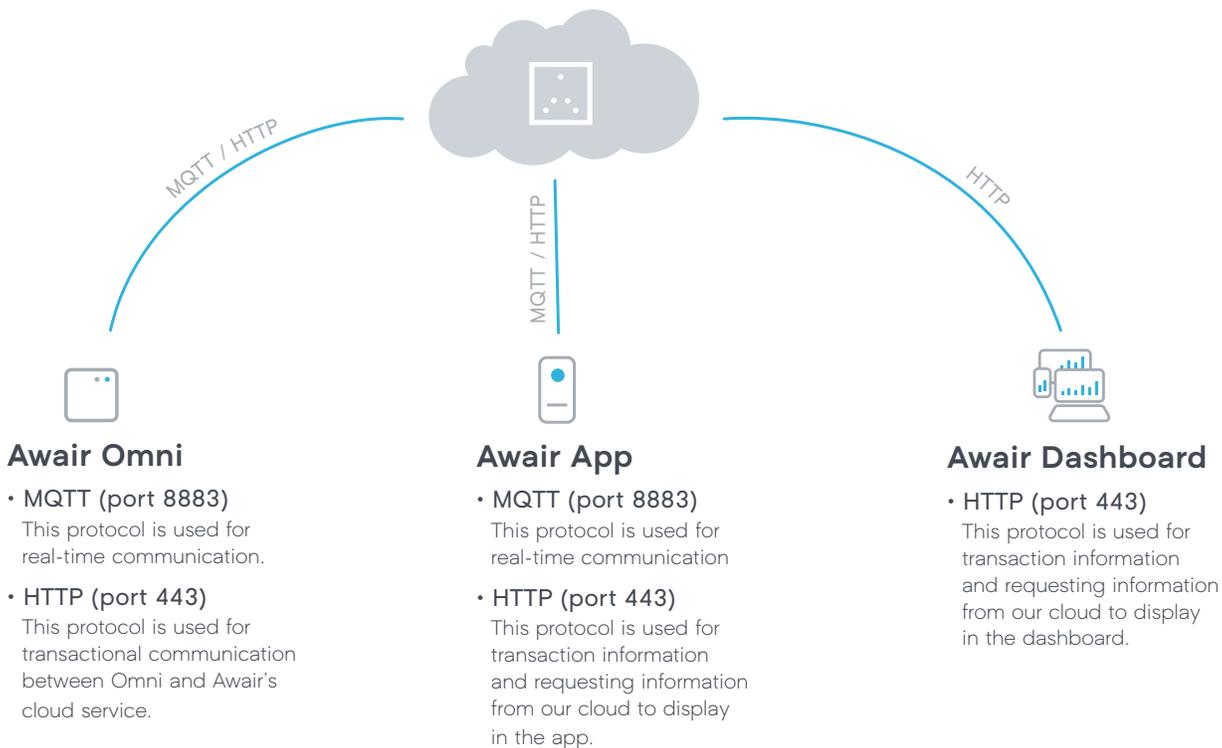
Awair collects relevant information to ensure that you are provided with an accurate and tailored experience that meets your specific needs. This information can include air quality sensor readings, information about your phone's firmware version, and your billing information.

Awair integrates with third party platforms to enhance the functionality of Awair products and services. When integrating with these services, your account information and device data may be shared, to the minimum extent required, with relevant affiliate third parties. Awair may also share data under legal obligations, in an emergency situation, or under other circumstances with your explicit consent.

Your personal information is stored on Awair's servers until it is edited or deleted. Backup copies of deleted information may need to be retained for a longer period of time, if required to do so for legal purposes.

Data Handling

Awair uses multiple protocols for data transfer purposes. Below is a list and diagram to outline which protocols are used, and for what purposes.



Data Connectivity

BACnet

What is it?

BACnet is a data communication protocol specifically designed for Building Automation Systems (BAS). A set of rules programmed into the BAS govern the behavior and interoperability of sensors, lights, locks, etc. throughout a building's infrastructure. Because BACnet is just the protocol, a network technology is still needed for device connectivity.

There are 2 main options Omni In-Wall Mount offers:

BACnet MS/TP (twisted pair wiring)

- Older technology, yet more common
- Slower than BACnet IP
- Usually never directly connected to internet, so safer yet might be an issue for Awair Cloud connectivity

Omni In-Wall Mount offers RS-485 twisted pair data communication through daisy chain wiring method.

BACnet over IP (Ethernet)

- Newer technology
- Easier installation if no existing BACnet infrastructure
- Reduced deployment costs
- Future-proof your Omni - receive firmware updates seamlessly

Omni In-Wall Mount uses Ethernet for power and data.

Benefits of using BACnet:

- **Cost-Effective** and **Easier**: Most commercial real estate already has a BACnet infrastructure in place, so it is cheaper and easier to integrate Awair sensors into the existing platform.
- **Safer**: Operates on its own isolated wiring / LAN = extra security because it is harder to hack

LOCAL API

Access your device's sensor data "locally" and in real-time without broader internet access.

Details:

Your Omni device can host data from an on-device server, which acts like a Cloud REST API. This data can only be accessed while you are connected to the same Local Area Network (LAN) as the device. This makes the server (and data) more secure because it is behind your firewall and not accessible to the internet. This hosted data is then displayed and organized like webpages with URLs.

Local APIs are enabled by default and you can fetch the latest sensor values every 10 seconds.

Accessing Your Data

Omni's Display

Omni shows real-time air quality data on the LED display. Omni's 7 display options allow you to see your air quality at a glance. The display mode options are:

- Awair Score (including five sensor indices)
- Temperature
- Humidity
- CO₂
- Total VOCs
- PM2.5
- No Display

The "No Display" mode allows you to disable any information presented on the Omni device. Display modes are selectable via the device settings in the Awair app. You can also swipe on the right edge of Omni's display to change the display mode, or press the Power Button to automatically cycle through Omni's real-time sensor readings.

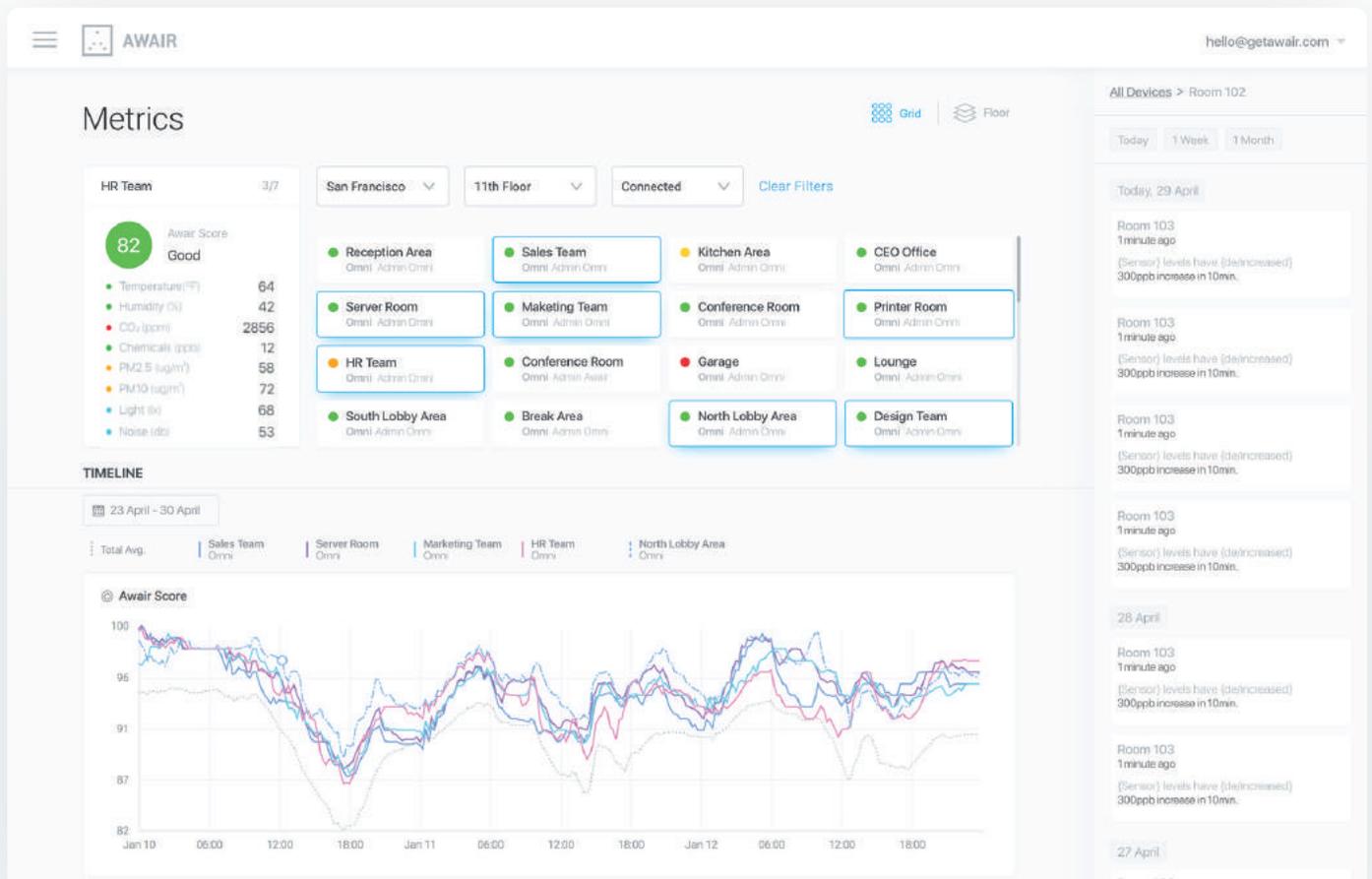
Awair Dashboard

The Awair Dashboard is designed for you to monitor multiple Omnis in one simple, easy-to-use portal. You'll also have access to trends and advanced analytics for both real-time and historical data.

Dashboard Home

Understand the health of your environment at a glance.

The dashboard's color-coded Awair Status Indicator allows you to view the current status of each of your Omnis. You can use the dashboard to compare air quality readings across multiple Omnis, locate trends, and troubleshoot potential problems. The Awair Dashboard also allows you to view historical data to help you understand how your air quality has changed over time.

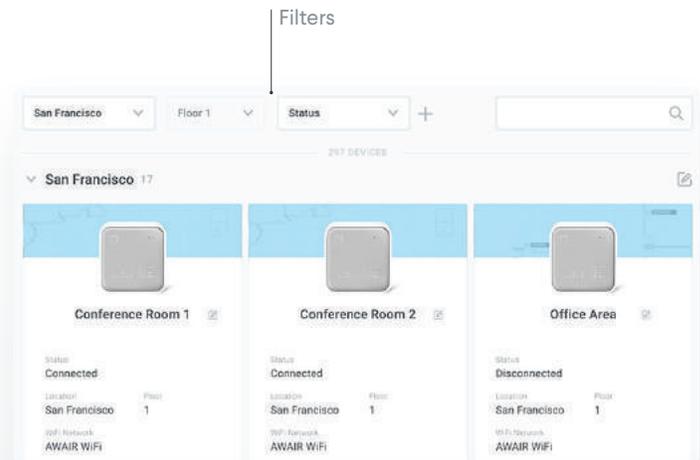


Device Management

Easily locate, manage, and customize your Omni device settings through the Device Management menu.

You can assign your Omnis to a specific location (e.g. London, England Office) and area (e.g. Lobby, Floor 1) within that location to contextualize incoming data and simplify device management. Within the Dashboard, you can also manage privacy settings by assigning new users specific roles (Organization Manager, Location Manager, and Location Member) that define their level of access and editing permissions.

The filter tab allows you to search for Omni devices by location, floor, and status (connected or disconnected) to easily diagnose problems with your air quality and remotely manage device settings.

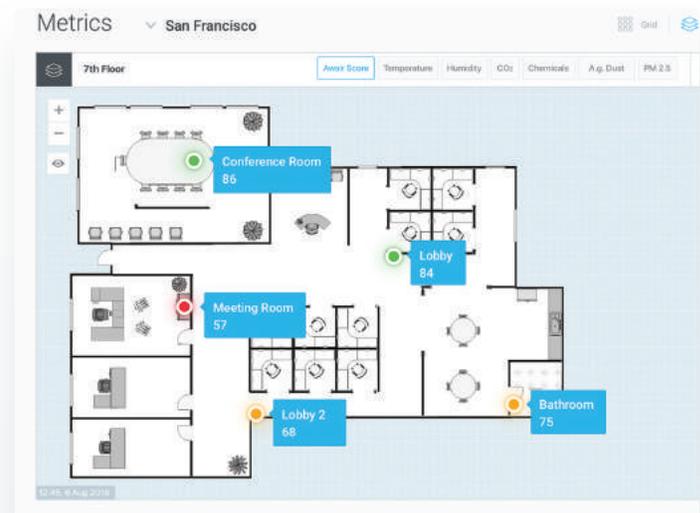


Floor Plan

Quickly identify problem areas on any floor.

Floor Plan is a feature on the Awair Dashboard that allows you to easily locate and manage all Awair devices throughout your space from the perspective of your project's floor plan.

Getting started is simple: upload a blueprint or map of your project's floor plan and the Awair Dashboard will provide you with a list of the Awair devices on your account. Drag and drop each device to its respective location in your building. Once the device is placed on your floor plan, it will provide you with color-coded, real-time air quality readings for this location.

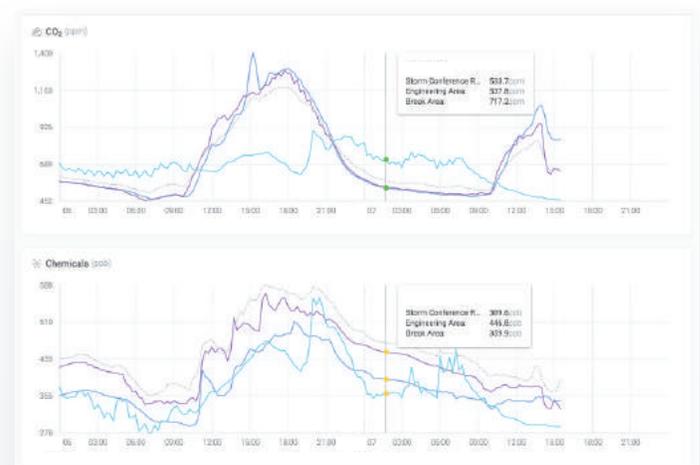


Data Export

Easily download your current and historical data as a .csv file.

The Export menu makes it easy to run custom data queries to use for internal reporting or certification requirements.

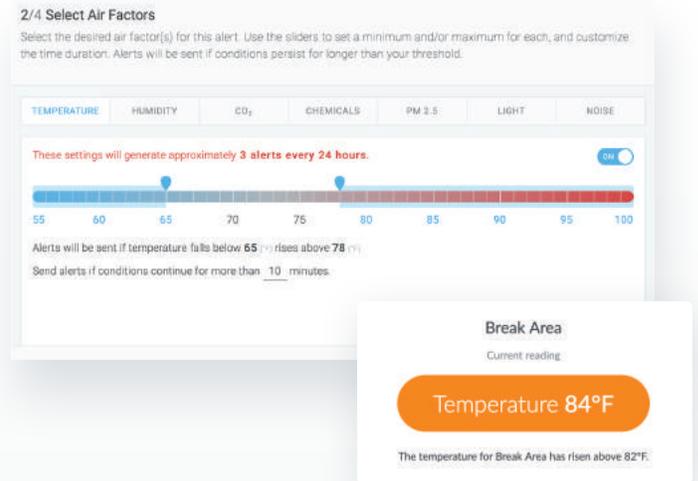
Search by location, floor, and device status to locate specific devices, and choose the time period and air quality factor(s) you're interested in. Then, simply click "export" to download query results as a .CSV file.



Notifications

Receive alerts when your air quality needs attention.

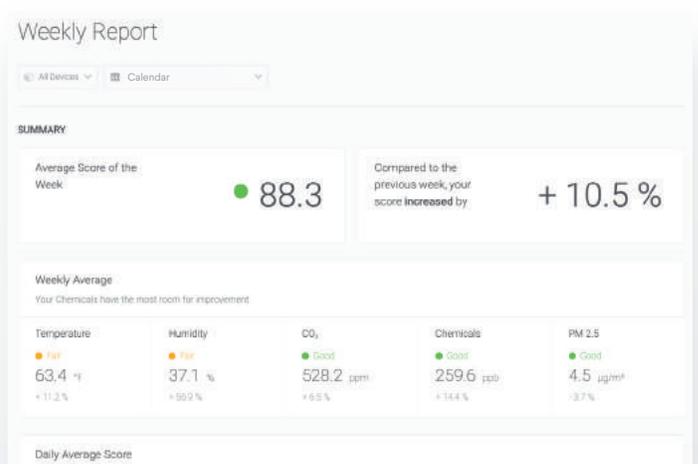
The Awair Dashboard can automatically notify you if your air quality readings become unhealthy. Enable notifications for all Omni sensors that are relevant to your goals, and we'll send you an email if and when your air needs attention.



Weekly Report

Receive a weekly assessment of Your organization's air quality.

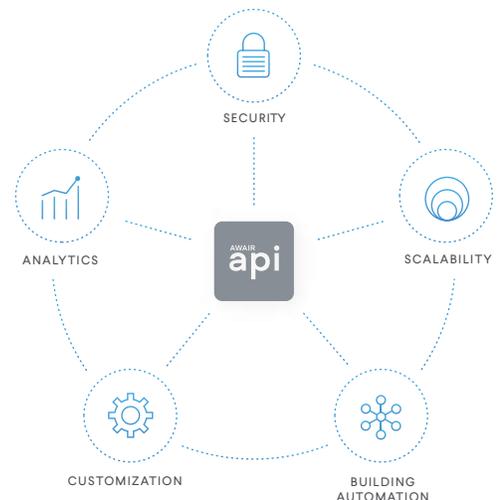
Awair will send you a Weekly Report outlining your air quality status from the previous week and indicating areas for improvement.



API

Awair's API allows you to import and utilize data from all Omnis in your organization. The API allows you to pull each Omni's 10 second raw data, five minute average data, and 15 minute average data. You can use the API for:

- Building automation
- Creating real-time displays of office air quality for employees
- Creating room-by-room building management visualization
- Connecting to IoT devices and services
- Importing external data for enhanced analysis
- Automating messages to customers and clients
- Auto-populating reports
- Much more



If you have any questions, we'd love to connect. Send us a message at business@getawair.com

AWAIR® Omni™

Trusted by Leading Initiatives

Real Estate Services & MEP Consulting



CUNDALL



HOARE LEA (HL)



DLR Group



CBRE

BURO HAPPOLD
ENGINEERING

Automation Integrators

Gratnells



Building Management Systems

Schneider
Electric

Energy/Service Providers

SGS

CLP 中電

Multi-family Housing

City of
Fort Collins

SK 건설

Office Spaces

Coca-Cola

LinkedIn

wework



Education Services

Stanford
University

BROWN

NUS
National University
of Singapore

HARVARD
UNIVERSITY

University of Colorado
Boulder

Hospitality Services

airbnb

HYATT