Set-up & Operating Manual

AirSentric

AirSentric

Indoor Air Quality Monitor

Model: WB55

Contents

1. Introduction

1.1 Overview

Before installing the AirSentric WB55 please give this manual a thorough read through. The manual provides all of the important information to help you successfully install the monitor and set up your online monitoring account. Please retain this manual for future reference.

1.2 Technical Specification

See airsentric.com/resources/

2. Hardware Configuration

The WB55 IAQ monitor comes equipped with a Zigbee wireless module, which enables multiple monitors to be installed in a single environment/area. Each unit then communicates back to a single internet enabled network point - the Data Hub - which connects to the online monitoring account.
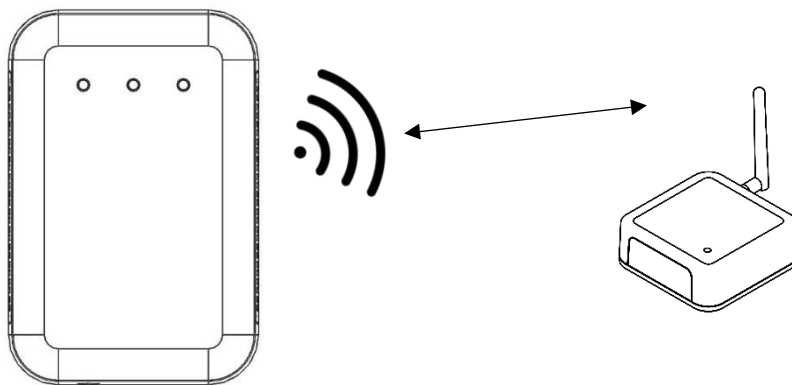

Figure 1 → WB55 wireless setup with Ethernet gateway unit

3. Hardware Installation

3.1 Requirements for Installing the WB55

In order to install the system, there must be access to the following;

- Access to a power connection

- Access to a wired internet connection for the gateway

- Once power is supplied and the data gateway is connected the unit will need to be added to your online monitoring account. Please note that you only need to add the monitor device ID to the online software.

Important Notes:

- Do not place your WB55 monitor near any heat source such as a radiator or at a window or direct sunlight.
- Place WB55 within range of your GY36 gateway.
- Place in an open space – avoid placing in areas where airflow may be obstructed

- Do not place where building occupants may be breathing directly at the monitor as this can have a disproportionate effect on sensor readings.

3.2 Coverage Area and Placement

Monitor Installation Density:

Monitor installation density may vary depending on whether compliance with a particular standard is being followed.

For example – The Well Building Standard guidelines recommend installing monitors within a regularly occupied or common space in the building at the following installation density:

- Projects with occupiable space of < 3250 m2 : 1 monitor per 325 m2 [3,500 ft2] in occupiable spaces (minimum 2)

- Projects with occupiable space of 3250-25,000 m2 : 1 monitor per 500 m2 [5,400 ft2] in occupiable spaces (minimum 10)

- Projects with occupiable space of > 25,000 m2 : 1 monitor per 1000 m2 [10,800 ft2] in occupiable spaces (minimum 50)

- Monitors must be distributed throughout the project and to the extent possible, representative of all HVAC zones, faces of a building, and regularly occupied spaces (e.g., open office areas, private offices, conference rooms and classrooms).

- For projects with multiple floors, monitors must be distributed across different floors, including the lowest and highest regularly occupied floor (excluding floors with only leased space in WELL Core and Core & Shell projects).

- Multifamily Residential projects may only utilize continuous monitoring pathways in non-dwelling unit spaces—dwelling units must meet performance requirements through methods described in the Performance Testing Protocols for WELL section. To determine the monitor density for all other non-dwelling unit spaces, follow monitor density rate for the total area of the non-dwelling unit spaces only.

- For projects containing large open spaces (e.g., gyms, ball rooms, etc.), one monitor is sufficient for an area of up to 2,500 m2 [27,000 ft2] if there is evidence that the air is evenly mixed and contaminant sources are uniform (e.g., testing and balancing report indicating ventilation rate is even throughout the space, IAQ report indicating ventilation rate and contaminant levels are even throughout a space).

Installation Location Options:

- Monitors are installed on a wall (vertically), at a height of 1.1-1.7 m [3.6-5.6 ft] above the finished floor.

- Monitors are installed on a ceiling (horizontally). This placement option is only applicable in spaces, 1) with ceilings are no greater than 3.7 m [12 ft] above the finished floor, 2) that do not utilize displacement ventilation, and 3) there is evidence that the air is evenly mixed. Evidence for evenly mixed air within a space is submitted in the sensor data package as a Letter of Assurance from an Engineer confirming that a space meets requirements of a ventilation guideline listed in A03: Ventilation Design Part 1: Ensure Adequate Ventilation.

- Monitors must be at least 1 m [3.3 ft] away from: doors, windows, air supply/exhaust outlets, air purifiers, or other potential influences (e.g., humidifiers, cleaning supplies, printers and photocopiers). To the extent possible, sampling points should be at least 5 m [16.4 ft] from exterior doors.

- Additionally, monitors measuring temperature and relative humidity must be at least 1 m [3.3 ft] away from: direct sunlight, mechanical system supply outlets, fans, heaters or any other significant source of heat or cold.

Source: WELL Performance Verification Guidebook Q4 2021

3.3 Mounting System

The WB55 can be wall mounted, using the included mounting plate, with anchor points on the baseplate. It is recommended that where possible all 4 mounting holes are used when securing the unit to a wall.

Please note: The unit is designed to be wall mounted vertically - long term use of the unit in the incorrect orientation will result in dust build up within the particle sensor (if a particle sensor is included in your configuration).
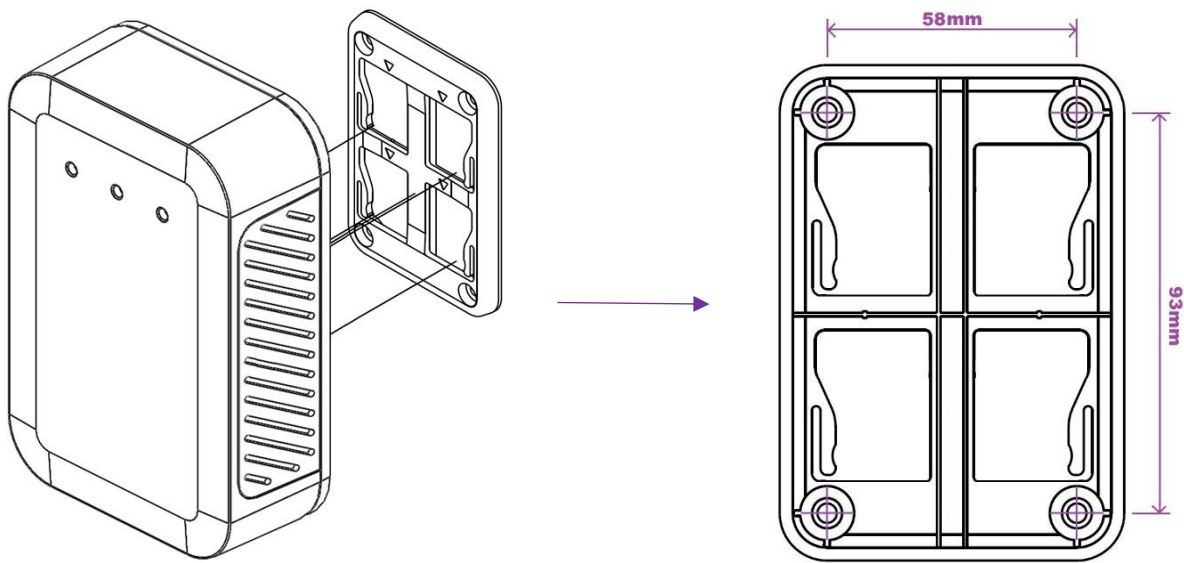

Figure 2 → Wall mounting points for the WB55

4. Power Supply

The WB55 Sensor includes a 12V power supply adapter. The adapter converter can operate at 100 – 240VAC (47-63Hz) and is compatible with the mains power network of most continents.

5. Internet Connection

5.1 Wireless Ethernet Gateway Connection

Your wireless monitor will need to be in range of the gateway which may be up to 30m depending on the environment.

- To set up the Gateway please connect the Ethernet cable provided to the DATA HUB and then connect to an Ethernet point or a spare Ethernet port on your router.

- Power on the device after connecting the supplied power supply. The device will power on automatically and establish a connection with the WB55 Sensor.

Please note: It can take up to 5 minutes for the gateway to pair with the monitor. You can check its status by viewing the sensor's dashboard for data arriving online.

5.2 Network Configuration

The DATA HUB will also by default automatically configure itself to your network settings using DHCP.

It is possible to configure the sensor to connect to a static IP address. Please see page 12 of this manual to complete this step.

6. Online Software Setup

6.1 Online Account Setup

To set up your online account to remotely monitor your IAQ monitor please navigate to https://hex2.nuwavesensors.com/ on your computer internet browser.

On the webpage you will be prompted to sign in or create an account. As this is your first time to access the account please click 'Create Account' just under the sign in section.
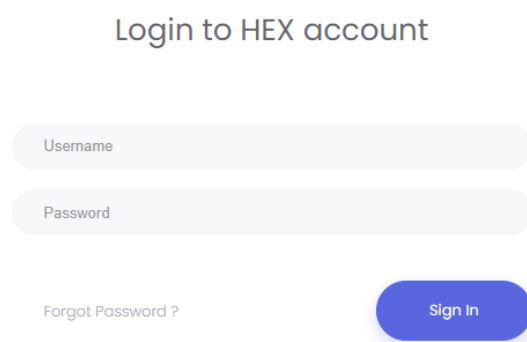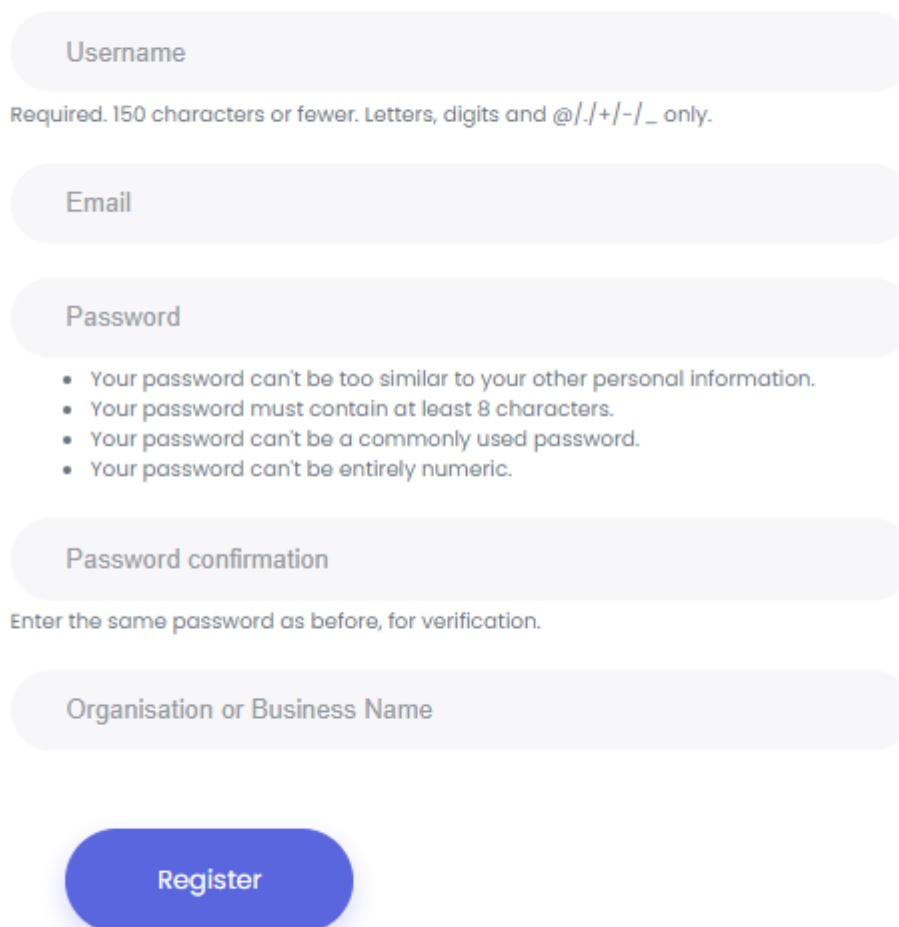
Login to HEX account

Username

Password

Forgot Password ?

Sign In

Figure 3 → Login Interface on Webpage

6.2 Account Registration

Please complete the form in order to complete the sign-up process. If you have any issues, please contact support at: info@nuwavesensors.com quoting the serial number of your monitor and gateway (found on the sticker on the back of both devices).
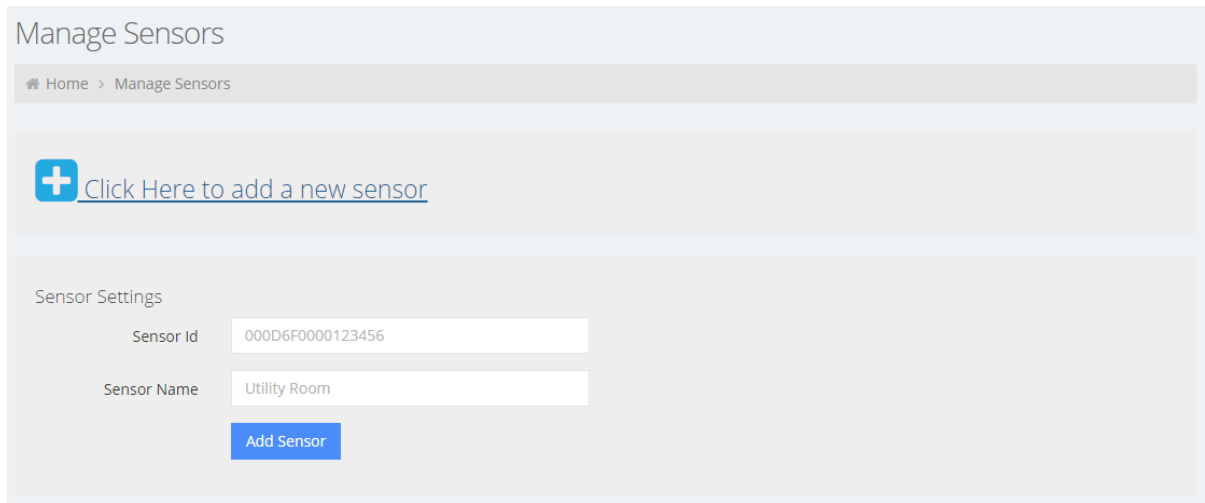

Figure 4 → Account Registration Form

6.3 Adding a monitor to your account

To add your new sensor, click **'Add Device' from the Manage Devices Page** and complete the form based on your sensor details;

- **Device ID:** Please enter the 16-digit sensor ID (sticker on the back of your sensor)

- **Name:** Example; Cleanroom 2A
- **Label:** Completing this field allows you to create groups of sensors based on your preference – example; 1st Floor. You can also leave this blank if you do not wish to create a group.

Manage Sensors

Figure 5 → 'Add Sensor' Interface Page

Once you have competed the above form click 'Add Sensor' button at the end of the form and your sensor will be added. To add another sensor at any time please repeat the steps above.

7. Viewing and Managing Sensor Data

After setting up the sensor and gateway correctly as well as adding your sensor after logging in you should now start to see data arriving on the sensor monitoring page. If you do not see data arriving after a period of 15 minutes, please refer to the gateway configurations setting in the troubleshooting section of this manual (page 17).

7.1 Sensor Status
Here you can view the current VOC reading as well as the current temperature and humidity reading from your sensor.
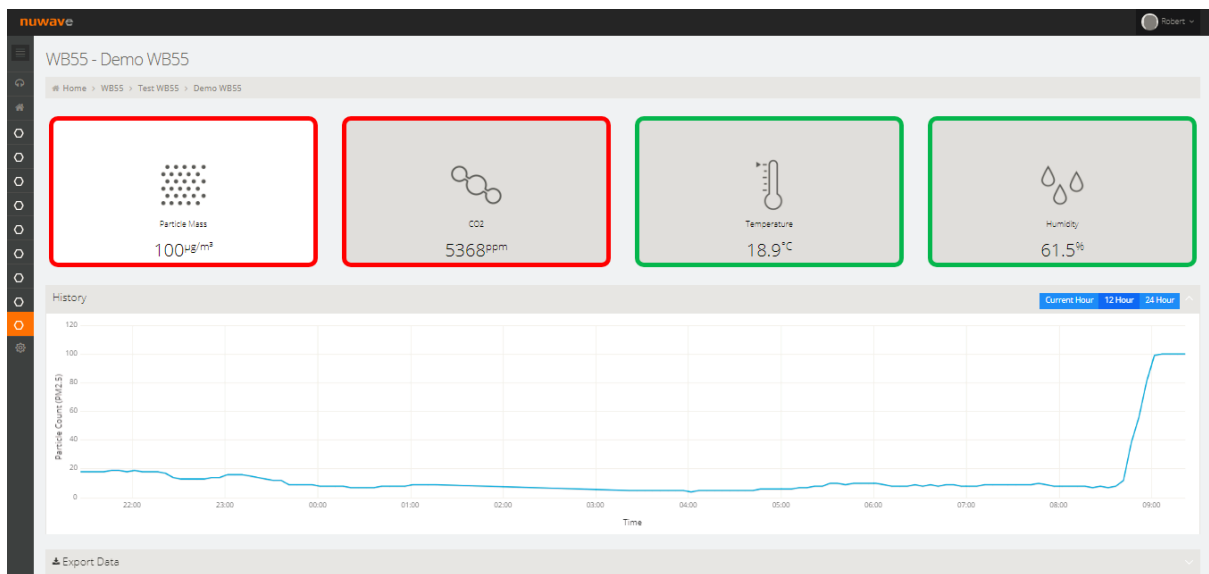
Figure 6 → Sensor Status Examples

7.2 Graphing Options

Data arriving on the website will be visible on the sensor graph. You can change between graph views of 1 hour, 12 hour or 24 hours.
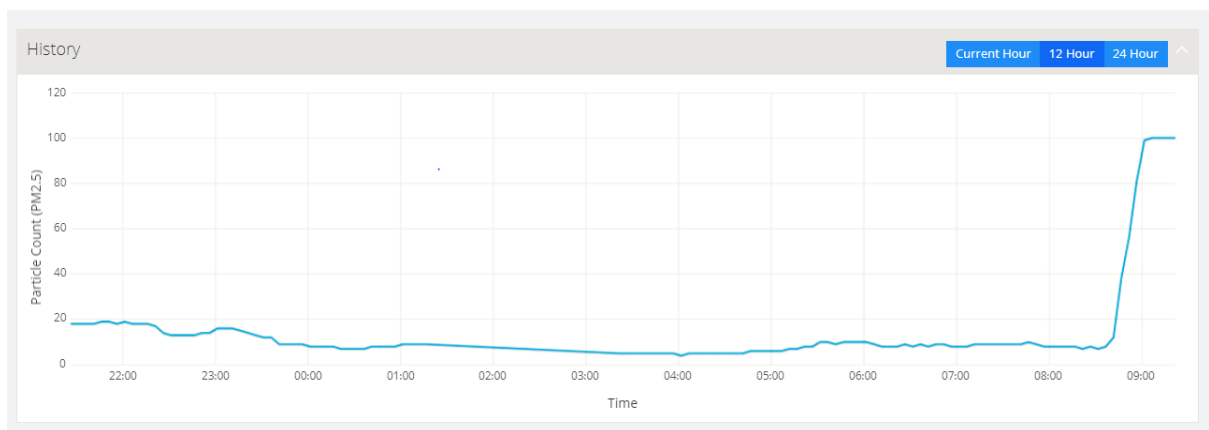

Figure 7 → Example Graph

7.3 Indoor Air Quality Bands (RAG Status)

Each parameter is represented by a widget on your dashboard. Each widget displays a current RAG status band (Red, Amber or Green) that changes in response to live sensor readings and indicates if the status is considered to be good, fair or poor.
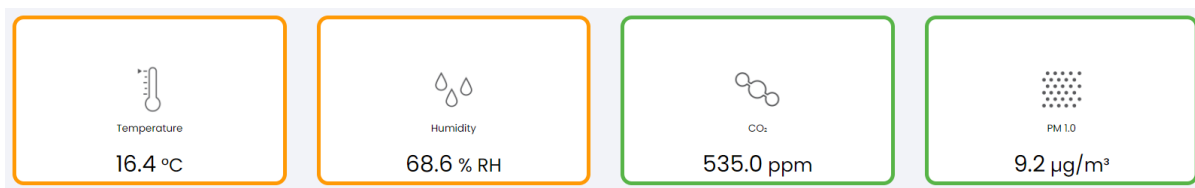

Temperature	Humidity	CO_2	PM 1.0
16.4 ºC	68.6 % RH	535.0 ppm	9.2 µg/m³

Figure 8 → Examples of Sensor Widgets

Guidance on Indoor Air Quality performance bands is constantly evolving and we aim to reflect current best practice. The default settings are shown below and bespoke settings may be available, please enquire with your NuWave representative.

IAQ

Parameter	Units	Green	Amber	Red
		Good	Fair	Poor
CO_2	ppm	0-799	800-1499	>=1500
$PM_{1.0}$	µg/m³	0-11	12-34	>=35
$PM_{2.5}$	µg/m³	0-11	12-34	>=35
$PM_{4.0}$	µg/m³	0-11	12-34	>=35
$PM_{10.0}$	µg/m³	0-19	20-44	>=45
TVOC	µg/m³	0-399	400-499	>=500
CH_2O	ppb	0-25	26-79	>=80
O_3	ppm	0-0.125	0.126-0.165	>=0.166

Thermal Comfort

Parameter	Units	Red (Lower)	Amber (Lower)	Green	Amber (Upper)	Red (Upper)
		Good	Fair	Good	Fair	Good
Temperature	°C	<16	16-21	21-23	23-25	>25
Rel Humidity	% RH	0-19	20-29	30-59	60-69	70-100

Figure 9 → IAQ Performance Bands

7.4   Export CSV data

For a longer-term view of the data or for detailed analysis you can download a CSV file of your data at any time.

Due to download file size limitations this is limited at 1 weeks' worth of data per download. The link to download your data will be e-mailed to the e-mail address registered with the account.
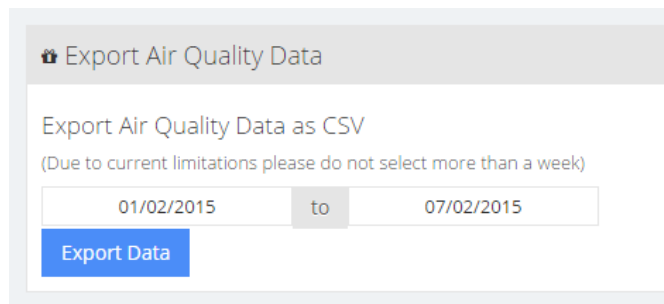

Figure 10 → Export Feature

7.5   Sensor Management Settings

At the bottom of each sensor you will find the sensor management settings. From here you can manage settings such as re-naming the sensor.
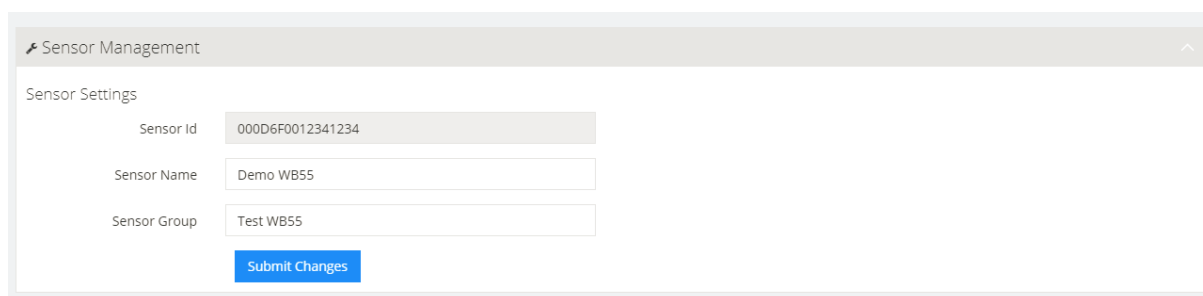

Figure 11 → Management Settings

Note: To save and changes make sure and click 'Submit Change' at the bottom of the form.

Project Location Settings:

The project locationcan be manually set on the map by editing the location pin. Press the Edit Button to access editing settings.
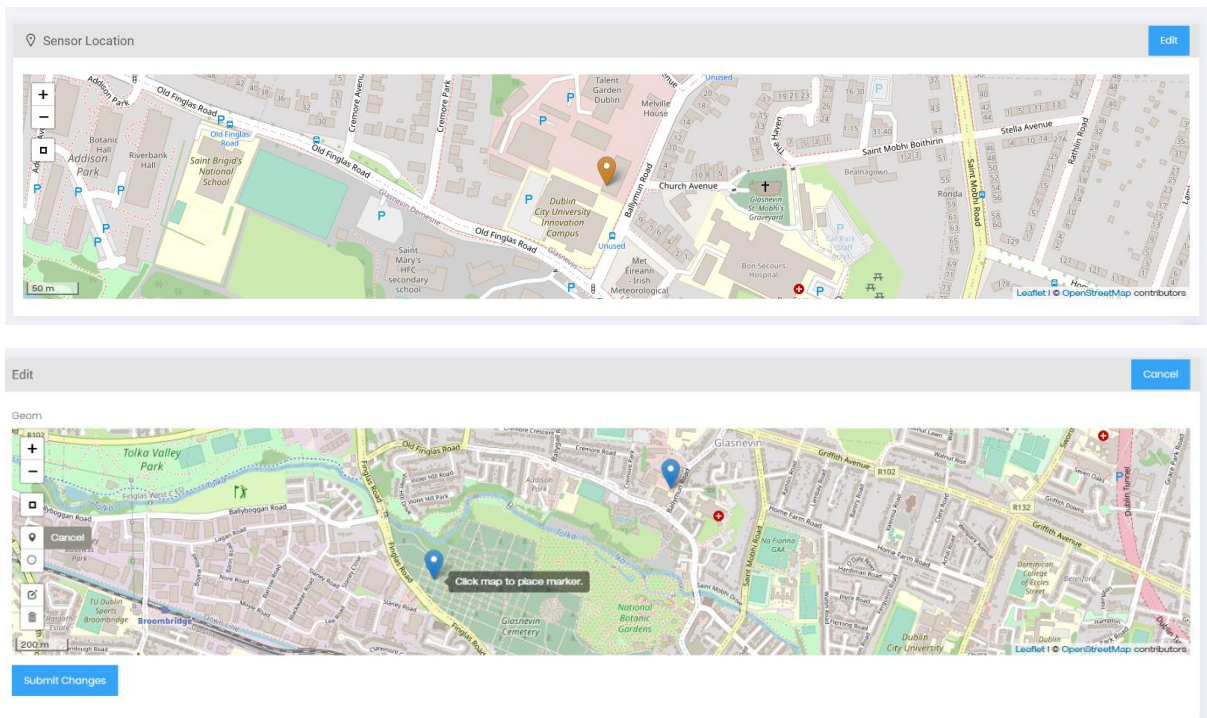
Figure 12 → Project Location Settings

Once the location has been selected, press 'Submit Changes' to save the project location.

Time and Date Settings:

The time and date setting change the time zone settings for a particular device according to its location. Once this is changed the data on the graph appears in this time zone.

Please note that this does not affect the time zone data of any data downloaded by CSV which will always be saved in UTC format.
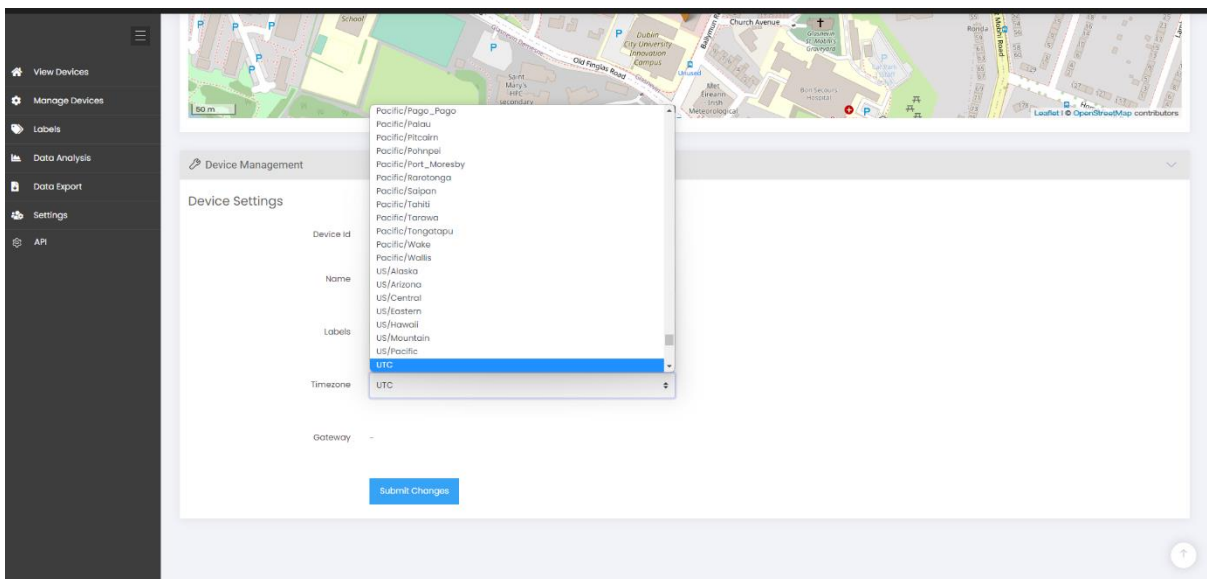

Figure 13 → Time and Date Settings

8. User Profile Settings

On the settings page you can edit and manage your user account details including;

- Change Password

- Change e-mail address associated with the account

- Address Location

Once any changes have been made click the 'Save Changes' button.

Figure 14 → Account Settings Page

9. API

NuWave Sensors offers a RESTful API to monitor devices connected to our HEX monitoring software.

Resources regarding the API for your installed monitors are available at the following link address:

https://hex2.nuwavesensors.com/api/docs/

10. Gateway Network Configuration

The DATA HUB gateway is configured to use DHCP by default. This automatically detects network settings on most standard networks and the sensor will be able to send data online without changing any settings.

If you need to configure a port on your network for the gateway the port and server address details are as follows:

Remote Port Number: 58122

Remote Server Address: gateway2.nuwavesensordata.com

You can also edit the network settings and assign a static IP using the gateway web interface of the gateway which is accessible using an internet browser. To access the gateway you must know the IP address which can be found using the MAC address of the gateway (located on the bottom of gateway).

When prompted, enter the following username and password;

Username: 'admin'

Password: 'admin' or 'alpha'

If you have any issues, please contact info@nuwavesensors.com

Figure 15 → Gateway Homepage

Figure 16 → Gateway IP Configuration Page

Figure 17 → Gateway TTL Configuration Page

Figure 18 → Gateway Misc Configuration Page

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Static IP Settings - Reset to DHCP

After setting a static IP address on the gateway and it is no longer accessible on the network you can reset the gateway back to using DHCP using the following instructions:

1. Unplug the device.
2. Plug the device back on while using a reset pin or paper clip to press and hold the reset button
3. The LEDs will flash rapidly before changing to a cyan colour to indicate the reset is underway – the reset button can now be released.
4. After a few minutes the LED will revert back to its normal state of green before trying to establish a connection with devices and the internet.
5. The gateway should be accessible on the network again. Please login to ensure that DNS settings are set to 'auto' (the greyed out settings are ignored). Finally, reboot the gateway to complete the process.

Figure 19 → Reset to DHCP

11. Calibration

Our sensors come factory calibrated and in most cases your sensors can be used for up to 3 years without calibration.

Calibration may be required in the following circumstances:

- You may require calibration for compliance purposes such as compliance with the Well Building Standard. In this case we recommend an annual calibration service
- If the devices are used in very polluted environments where a lot of dust is present this can have an impact on the particle sensor accuracy
- Exposure to high levels of chemicals can have an impact on the VOC or formaldehyde sensor
- The temperature and humidity sensor will have a small amount of calibration drift annually which can be adjusted for with a calibration

Please contact us directly in order to arrange a calibration service at support@nuwavesensors.com

12. Important Precautions

Caution! This device is recommended for use indoors and in a dry location only.

- Avoid using the WB55 in very dusty environments as dust build up may obstruct the air flow within the device.
- Take care when using the WB55 to route the power cable in a way that reduces the risk of injury to others, such as by tripping or choking.
- Do not cover or obstruct vents around the WB55 sensor.
- Only use the power adapter supplied with the WB55.
- Do not insert anything through the vents.
- Do not inject gas, dust or chemicals directly into the WB55 monitor.
- Do not use this device near water.
- Do not drop or subject the device to undue shock.
- Do not place in insect-infested areas. Insects can block vent openings to the sensors.

The WB55 is designed to be maintenance free, but you should keep it clean and avoid dust build up - especially around the air vents of the sensor which can reduce performance.

To clean the WB55:

1. Turn off mains power and remove the power adapter plug from the WB55.
2. Wipe the outside with a clean, slightly damp cloth. Don't use soap or solvents!
3. Very gently vacuum around the vents of the WB55 sensor to remove dust obstructing the vent openings.

Note:
- Never use detergents or solvents on your WB55 sensor or spray air fresheners, hair spray or other aerosols near it.
- Do not place the WB55 in water or let water get inside the WB55 sensor.
- Do not paint your WB55 sensor.

13. Recycling and disposal

The WEEE symbol on this product means that the WB55 should be disposed of separate from ordinary household waste at the end of its life in accordance with local regulations. Please take the WB55 to a collection point designated by your local authority to be recycled to help conserve natural resources.

14. Appendix

14.1 Product Warranty

Limited Product Warranty

THIS LIMITED WARRANTY CONTAINS IMPORTANT INFORMATION ABOUT YOUR RIGHTS AND OBLIGATIONS, AS WELL AS LIMITATIONS AND EXCLUSIONS THAT MAY APPLY TO YOU AS PART OF THE TERMS AND CONDITIONS OF SALE IN EFFECT AT THE TIME THAT YOU PURCHASE A NUWAVE SENSOR TECHNOLOGY LIMITED PRODUCT.

What this warranty covers?

NuWave Sensor Technology Limited ("NuWave") warrants to the original purchaser of this WB55 sensor (the "Product") shall be free of defects in design, assembly material, or workmanship under normal use for a period of two (2) years from the date of purchase (the "Warranty Period").

NuWave does not warrant that the operation of the Product will be uninterrupted or error-free. NuWave is not responsible for damage arising from failure to follow instructions relating to the Product's use. This Limited Warranty does not cover software embedded in the Product and the services provided by NuWave to owners of the Product. Refer to the licence agreement accompanying the software for details of your rights with respect to their use.

Remedies

NuWave will repair or replace, at its option, any defective product free of charge (except for shipping charges for the product). Any replacement hardware product will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer. In the event that NuWave is unable to repair or replace the product (for example, because it has been discontinued), NuWave will offer either a refund or a credit towards the purchase of another product from NuWave in an amount equal to the purchase price of the product as evidenced on the original purchase invoice or receipt.

What is not covered by this warranty?

The warranty is null and void if the Product is not provided to NuWave for inspection upon NuWave's request, or if NuWave determines that the Product has been improperly installed, altered in any way, or tampered with. The NuWave Product Warranty does not protect against floods, lightning, earthquakes, war, vandalism, theft, normal-use wear and tear, erosion, depletion, obsolescence, abuse, damage due to low voltage disturbances such as brownouts, non-authorised program or system equipment modification, alternation or other external causes.

How to Obtain Warranty Service

Please review the online help resources at airsentric.com/resources/ prior to seeking warranty service. To get service for your WB55 sensor you must take the following steps;

1. Contact NuWave Sensors customer support. Contact information can be found by visiting airsentric.com
2. Provide the following to the customer support agent;
    a. The serial number found on the back of your WB55 sensor
    b. Where you purchased the product
    c. When you purchased the product
    d. Proof of payment
3. Your customer service representative will then instruct you on how to forward your receipt and your WB55 as well as how to proceed with your claim.

It is likely that any stored data relating to the product will be lost or reformatted during service and NuWave will not be responsible for any such damage or loss.

NuWave reserve the right to review the damaged NuWave product. All costs of shipping the Product to NuWave for inspection shall be borne by the purchaser. Damaged equipment must remain available for inspection until the claim is finalised. Whenever claims are settled NuWave reserves the right to be subrogated under any existing insurance policies the purchaser may have.

Implied Warranties
EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ALL IMPLIED WARRANTIES (INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) SHALL BE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.
Some jurisdictions do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you.

Limitation of Damages
IN NO EVENT SHALL NUWAVE BE LIABLE FOR INCIDENTAL, SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR MULTIPLE DAMAGES SUCH AS, BUT NOT LIMITED TO, LOST BUSINESS OR PROFITS ARISING OUT OF THE SALE OR USE OF ANY NUWAVE PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Statutory Rights
This warranty gives you specific legal rights, and you may have other rights, depending on your jurisdiction. These rights are not affected by the warranties in this Limited Warranty.

14.2 Troubleshooting

| Problem	Possible Issue	Solution
No data arriving online after 5 minutes	Outside of wireless range	The wireless range of the sensor can vary greatly depending on the environment. To test this please plug the WB55 in close range to the DATA HUB. Data should arrive online after about 5 minutes. In this case the Data Hub will need to be re-positioned closer to the sensor location.
	Ethernet Cable not firmly connected	Power off both the DATA HUB and WB55 SENSOR by plugging out the power supplies. Please ensure that the Ethernet cable is firmly connected to both the DATA HUB gateway and the port on your broadband router. Apply power to both devices and check to see if data arrives after 5 minutes.

Figure 20 → Troubleshooting Table

14.3 WB55 Dimensions

150 mm

100 mm

45 mm
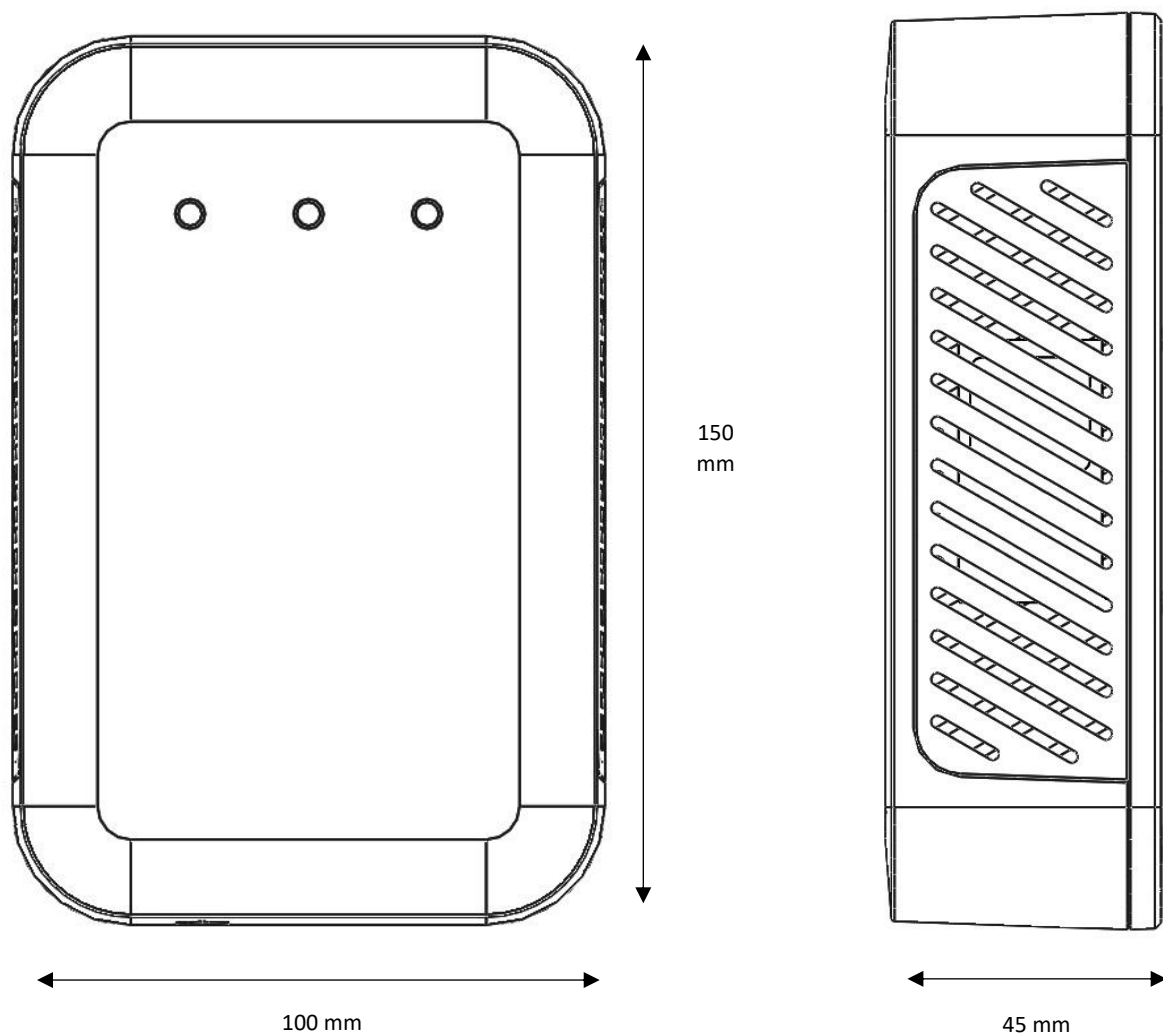
Figure 21 → Enclosure Dimensions

14.4 CH20 Sensor - Interfering Gases

Gas	Concentration	Concentration output
NH_3	50ppm	0ppm
C_6H_6	100ppm	0.1ppm
Cl_2	10ppm	0.1ppm
CH3CL	5ppm	0.1ppm
C3H6O	100ppm	0.2ppm
C2H4O	10ppm	0.5ppm
SO2	20ppm	0.8ppm
H2S	100ppm	3.7ppm
H2	500ppm	5.5ppm
C2H5OH	131ppm	5ppm
CH3OH	42ppm	5ppm
CH2O	5ppm	5ppm

Figure 22 → Interfering Gases