



LAMINAR AQM21

USER MANUAL

Revision History

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PRECAUTIONS

1. The device must be mounted on a stationary platform and location should be obstacle free.
2. The device must be installed at a height of 6 to 10 meters above ground level.
3. Mounting accessories should be fastened properly.
4. The installation site should be free from vibration and any external interference (avoid support structures close to trains, trams, heavy trucks and so on.)

Do's

- Check the supply voltage using voltmeter (+9 to +28 V DC) before connecting to the device.
- Open the enclosure of the device only in a dry and clean environment.
- Take the required ESD precautions.
- While connecting the cables, examine the cable end plugs for any damage of pins. Ensure that this is rectified, before the connections are made.
- Make sure all connections are properly done as given in the manual before switching ON the power supply.
- Sensors can only be connected to their respective terminals as mentioned in wiring diagram provided along with device.
- Handle the device carefully.
- Protect the device against mechanical stress and vibrations.
- Power OFF the device and remove the power supply before performing any maintenance activity. Verify the changes and then Power ON the device.

Don'ts

- Do not connect / disconnect any cable when the device is powered ON.
- Do not use any other tools (except screwdriver) for connecting or disconnecting the cables.
- Do not use the device in areas with excessive shock, dirt, moisture, or corrosive gases.
- Do not make any connections to the device without reading the complete manual. Incorrect connections may cause permanent damage to the device.
- Avoid direct contact with the PCB.

Note:

The ambient temperature of the area should not exceed the maximum rating specified in section 7.

Warnings

- Power must be switched OFF before changing the connections.
- Do not provide reverse supply voltage to the device. This may permanently damage the device.
- Do not connect power supply to any other connectors.
- Press IP reset button only when required. Avoid frequent use.

Earthing

- Proper earthing needs to be done for the entire system including the sensors and metal body of the enclosure.
- If installed on a pole, the metal pole must have proper earthing.
- The earthing can be done using a single core PVC insulated copper flexible cable with 16 sq.mm cable.
- The earthing needs to be frequently checked. In the dry season the earthing should be checked once in every 15 days. Earth resistance must be as lowest as possible according to site soil condition. Ideally earth resistance should be less than 10 Ω .

Lightning Surge Protection

- A separate Lightning Arrestor (LA) needs to be used for protection against lightning surge.
- The earthing rod must be properly installed as per the guidelines.
- The LA must be connected with the earthing pit using a 16 sq.mm cable.
- For all the external interfaces **Aeron** recommends using the surge protection device on power and data communication lines to avoid system damages from external surges. Aeron's surge protection device (SPM) can be ordered separately.

Note:

The LA safely releases the lightning into the ground and prevents the damage to the data logger and sensors.

1. OVERVIEW

1.1. About AQM21

Aeron's LAMINAR-AQM21 is a smart monitoring solution used to monitor the real-time status of ambient air, noise and weather parameters. It gives data for multiple parameters like various gases of air, particulate matters like $PM_{2.5}$, PM_{10} , air temperature, atmospheric pressure, relative humidity, noise, UV radiation, light intensity, wind speed, wind direction and so on. The parameters of LMR-AQM21 can be configured as per requirements.

Sensor sampling is performed at the rate of 200 Hz (maximum) with industry's leading ADC with the resolution of 24 bit (> 20 ENOB).

The device communicates the data securely to the cloud (via Ethernet / Wi-Fi / LTE) for real-time environment and industrial process monitoring. The device also provides easy access to logged data through webpage accessible in local and remote networks.

Data can also be downloaded to computer from the webpage or by inserting a pen drive in the device.

1.2. This Document

This document is the user manual for Aeron's LMR-AQM21. The document contains the device description, block diagram and other device related information. The document also contains the FAQs and precautions for the device.

Please read the document thoroughly before operating the device.

2. DEVICE AT A GLANCE

- Easy to install and maintain
- Compact design
- Low power consumption
- Rigid design for harsh environment conditions
- Available with battery backup upto 24 Hrs.
- Data logging over cloud
- Comes with embedded local webpage
- Can be configured through web page
- Factory calibrated

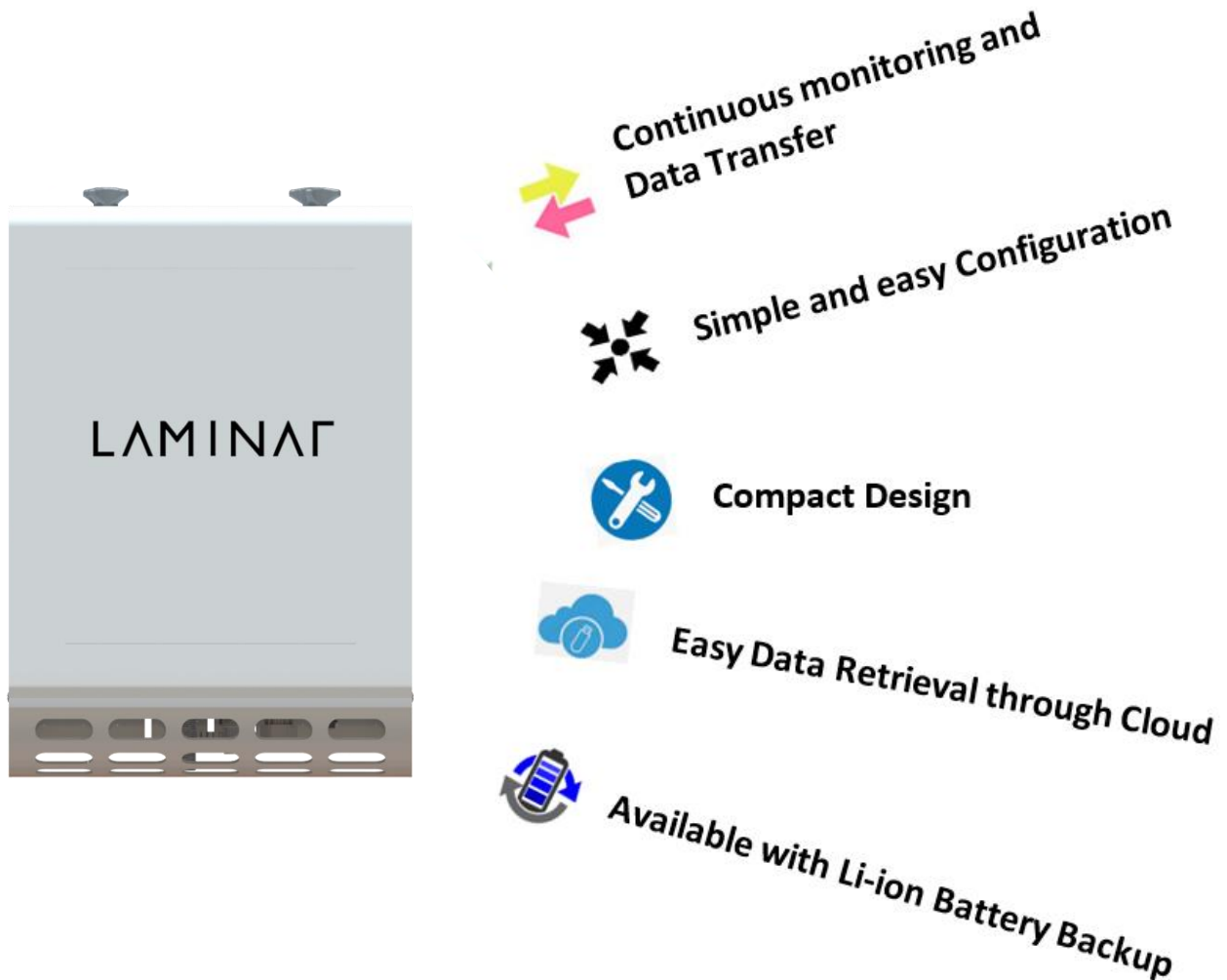


FIGURE 1: DEVICE AT A GLANCE

3. FEATURES

- 24-bit ADC resolution
- Multiple sensors parameters logged simultaneously
- Selectable logging and update rates
- Connectivity over Ethernet, Wi-Fi, LTE/UMTS/GPRS
- Industrial Grade
- CSV data download via embedded webpage and USB Pen Drive
- Time synchronization via GPS, Internet and cellular network
- Continuous sensing of 11 types of air pollutant data for Air Quality Indexing (AQI)
- Tampering alert switch provided for tampering and security alert

4. APPLICATIONS

- Smart City Air Quality Monitoring
- Traffic Area Pollution Monitoring
- Industrial Environment Monitoring
- Airport Pollution Monitoring
- Meteorological / Education Institute and Information
- Construction Site Analysis for air pollutants
- Urban and National Air Pollution Monitoring
- Transportation Monitoring
- Hotspot Identification and Characterization
- Air Quality Indexing for Research

5. NEED FOR MONITORING

Air pollutants are added in the atmosphere from variety of sources that change the composition of atmosphere and affect the biotic environment. Vehicles, industrial sources and domestic sources are the major cause of poor air quality. Poor air quality and pollution levels have been linked to several health conditions and life expectancy. The ambient air quality monitoring is required to determine the existing quality of air, evaluation of the effectiveness of control program and to identify areas in need of restoration and their prioritization.

5.1. Solution for Smart Cities

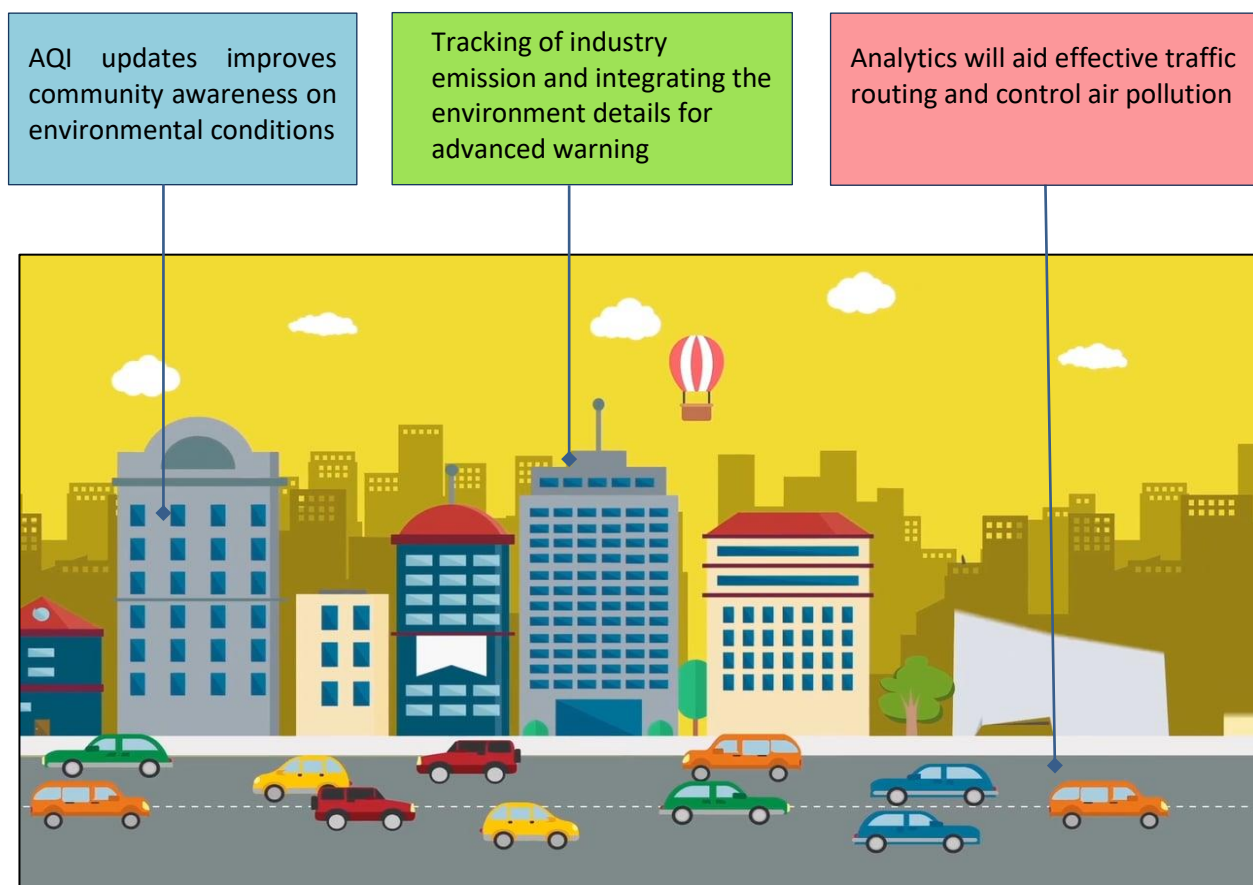


FIGURE 2: SOLUTION FOR SMART CITIES

5.2. Education and Information



FIGURE 3: EDUCATION AND INFORMATION

5.3. Hotspot identification and characterization

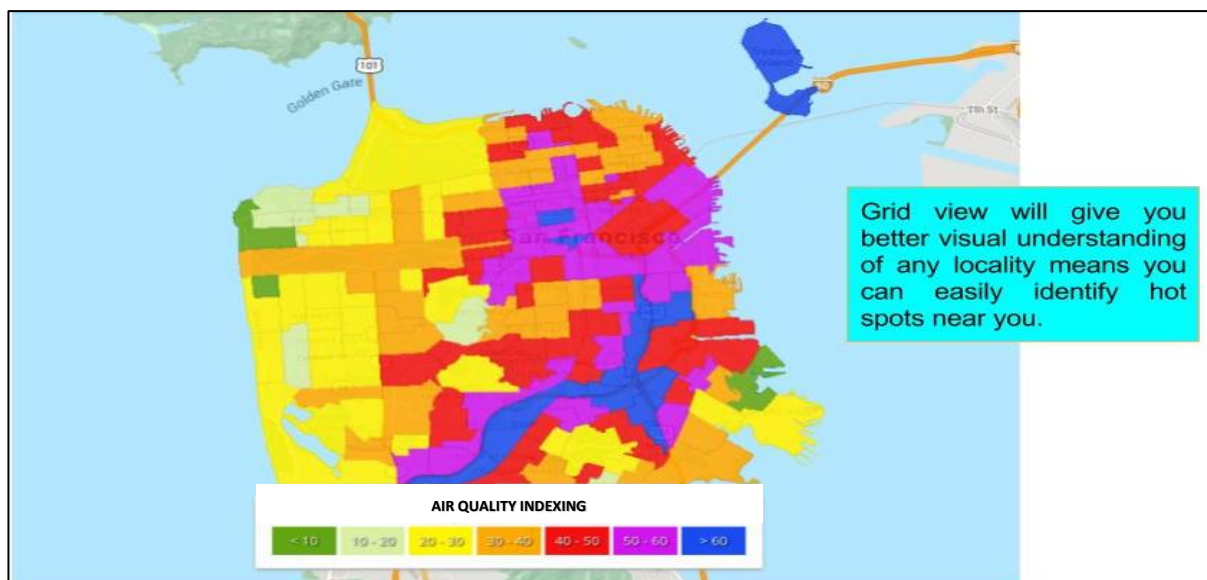


FIGURE 4: HOTSPOT IDENTIFICATION AND CHARACTERIZATION

5.4. Industrial environmental monitoring

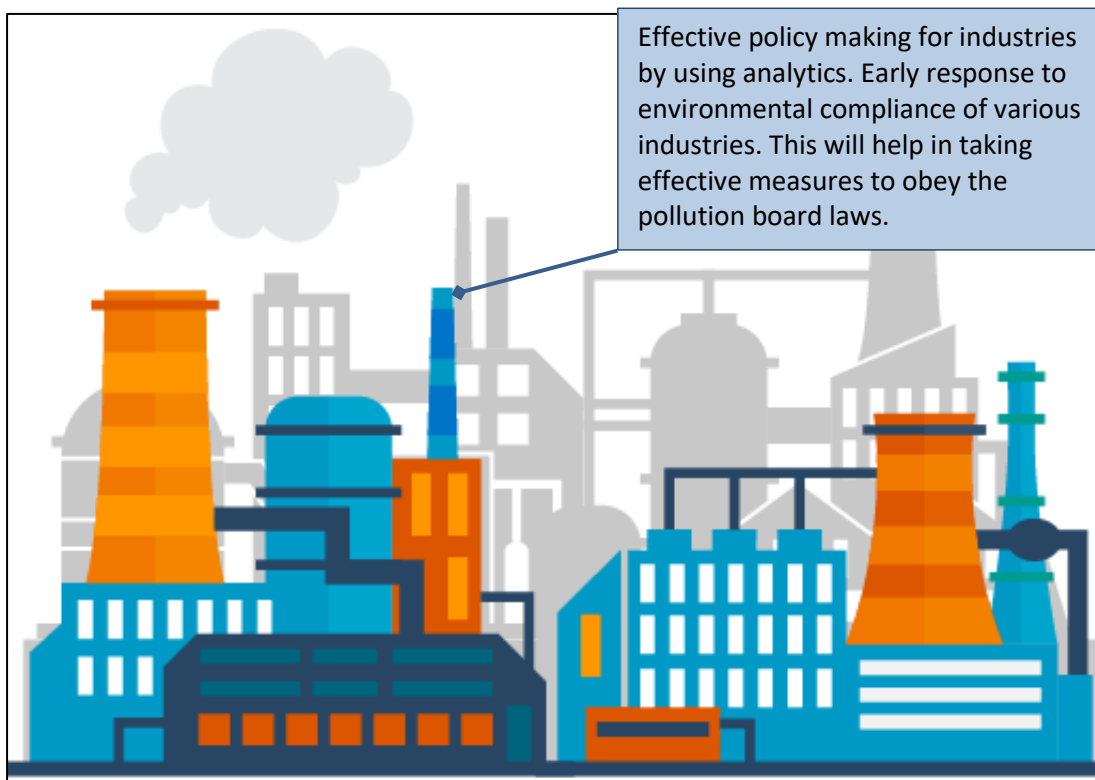


FIGURE 5: INDUSTRIAL ENVIRONMENTAL MONITORING

5.5. Construction site analysis



FIGURE 6: CONSTRUCTION SITE ANALYSIS

6. DEVICE SPECIFICATION AND DESCRIPTION

6.1. AQM21 Enclosure Front View

The Enclosure assembly consist of controller unit, various gas/ weather sensors, terminal block and so on. The placement of sensors will vary depending on the user configuration.

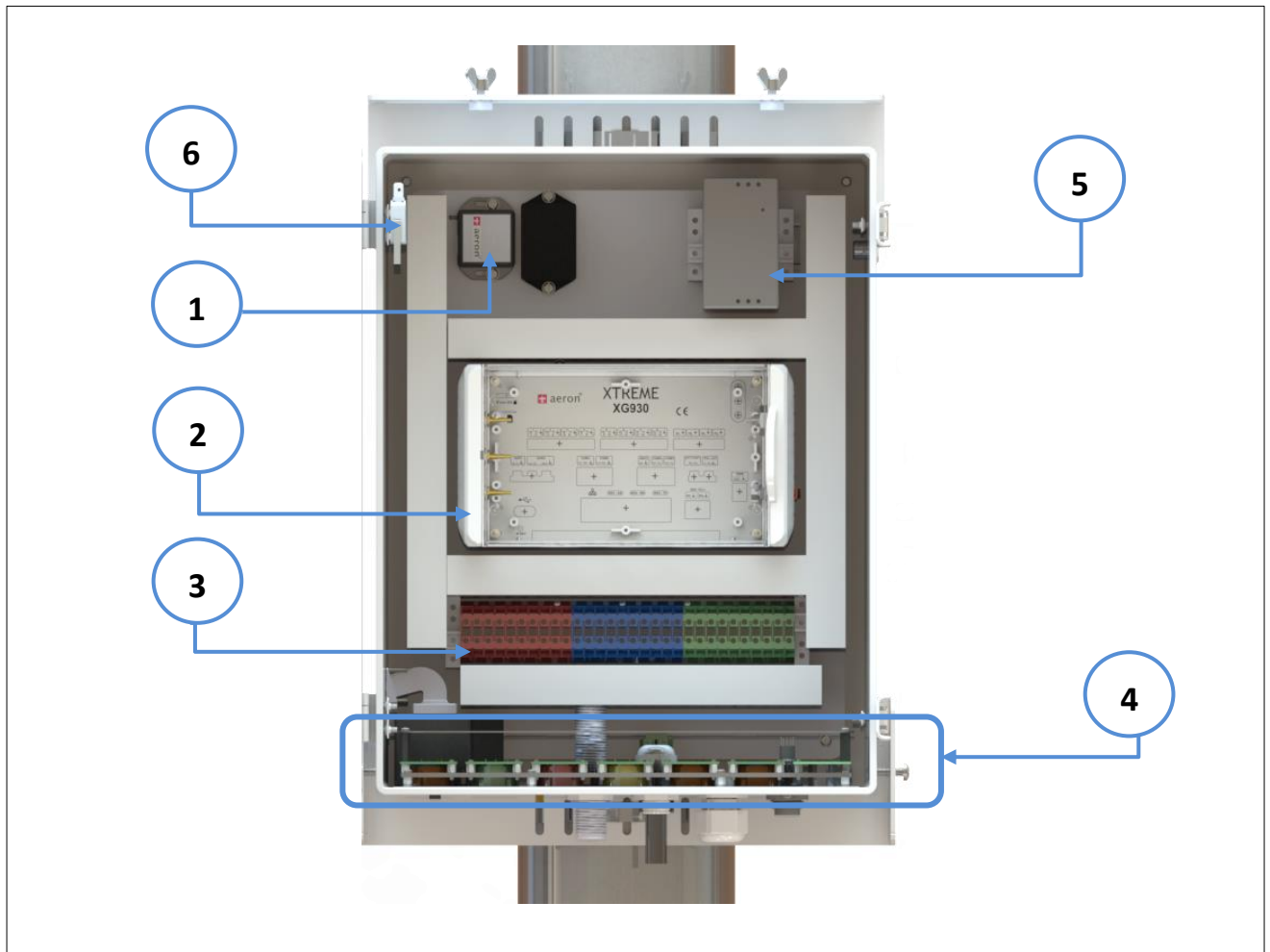


FIGURE 7: AQM21 FRONT VIEW

- | | |
|--------------------|--------------------------|
| 1. Pressure Sensor | 4. Sensor Arrangement |
| 2. Data Logger | 5. Adaptor |
| 3. Terminal Block | 6. Limit / Tamper Switch |

6.2. Bottom Connectors

It is situated at the base of sensor enclosure assembly. Power switch, as well as various ports such as Ethernet, USB, and so on, can be found here. A gland is also provided to route cables/wires required to connect with sensor assembly & datalogger.

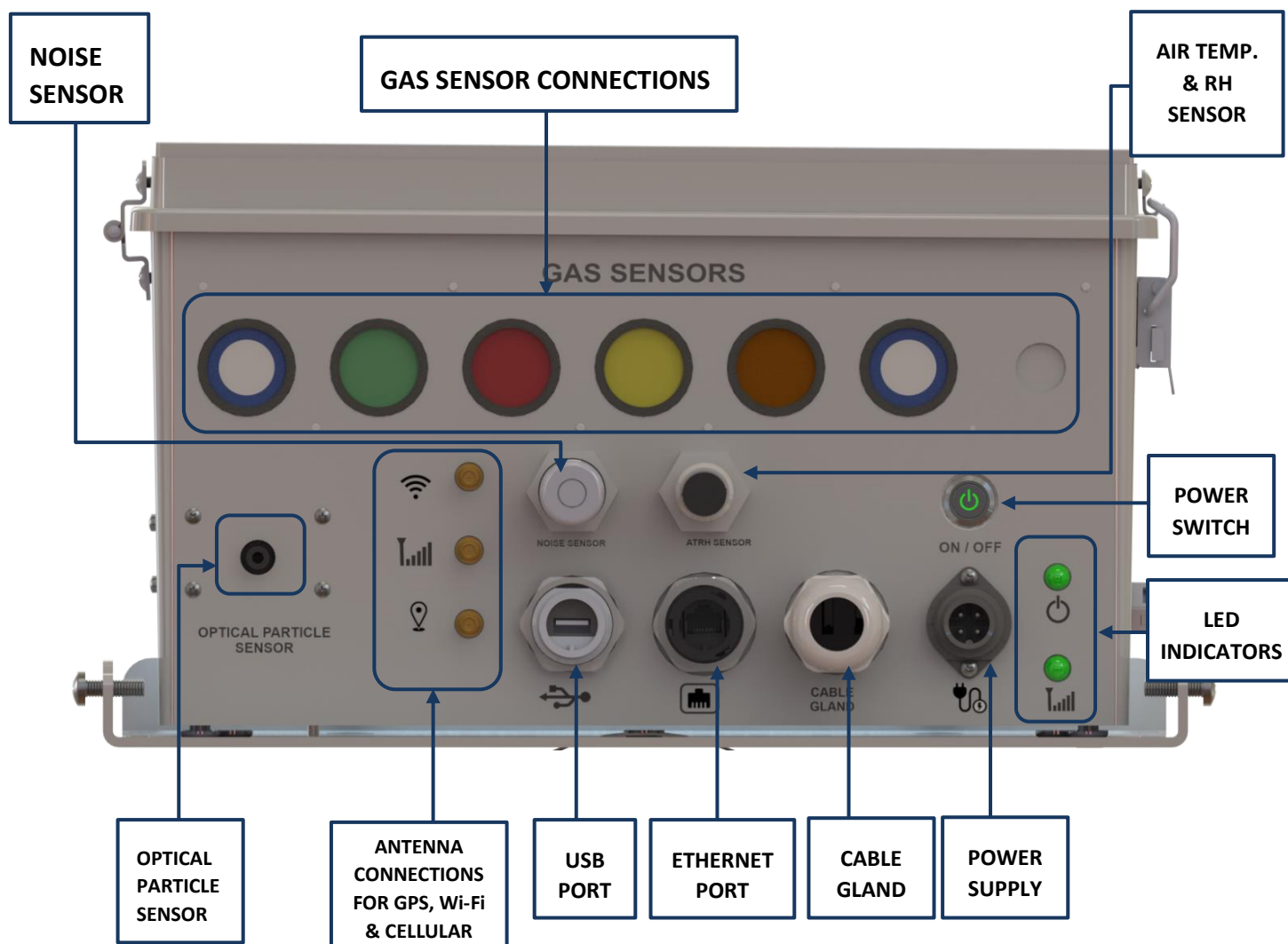


FIGURE 8: AQM21 BOTTOM CONNECTORS

6.3. Block Diagram

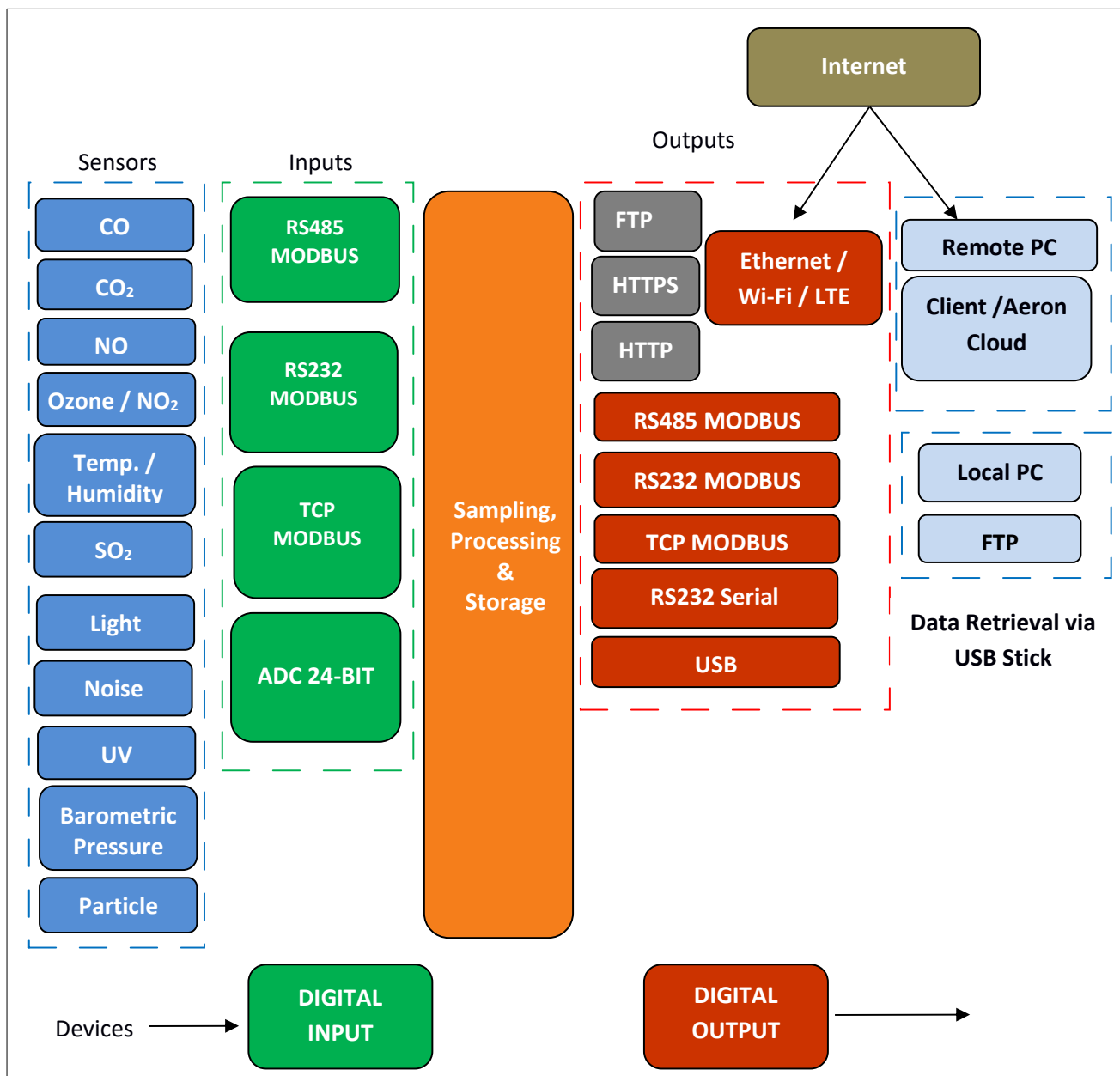


FIGURE 9: LMR-AQM21 BLOCK DIAGRAM

6.4. Component Details

- **Gas and Weather Sensors:** Sensors give output in analog voltage or current and further it converts these inputs to digital form for processing and sending to the cloud server.
- **PLC/SCADA/Inverter/Energy Meter:** AQM21 can read data / accept inputs from PLC / SCADA / Inverters / Energy Meters via RS232 or RS485 serial data over MODBUS RTU and MODBUS TCP.
- **Sampling & Processing:** Data collected from sensors are converted from a continuous signal to a discrete signal and sent to the processor for further processing.
- **Data Storage:** The data stored in device is in '.CSV' format. The retention period for the data is upto 5 years from the current date.
- **GPS:** AQM21 has a built in GPS receiver for device location and time synchronization.
- **Ethernet / Wi-Fi / LTE:** The Ethernet / Wi-Fi / LTE interface can be used to send the AQM21 data to the server via Internet
- **MODBUS Communications:** MODBUS Data is available over RS232, RS485 and TCP. The available ports are:
 - i. RS232 Serial Input / MODBUS Master (1)
 - ii. RS232 Serial Output / MODBUS Slave (1)
 - iii. RS485 Serial Input / MODBUS Master (1)
 - iv. RS485 Serial Output / MODBUS Slave (1)
 - v. TCP MODBUS Master and Slave.
- **USB Port:** Data can be downloaded in pen drive by inserting it into the USB port.

6.5. Gas Sensors

The device has multiple sensors to sense the data for air quality. These sensors are based on the principle of electrochemistry which are highly effective and have good operational life. Air sensors comprises of various gas sensors like sensor for Carbon monoxide, Carbon dioxide, Nitric oxide, Nitrogen dioxide, Sulphur dioxide, ozone, and many such toxic gases. These sensors can help serve many purposes and help bring attention to environmental issues beyond the scope of the human eye. The goal of this device is therefore to develop a more complete understanding of urban atmospheric chemistry in smart cities using low-cost atmospheric measurement devices, gathering data that can be leveraged by governments and researchers to mitigate air pollution. The sensors are enclosed with IP55 protection standard.

Carbon monoxide

Carbon monoxide (CO) is a criteria pollutant. The majority of CO emissions in urban environments come from mobile sources e.g. cars, trucks, ships and off-road vehicles. The CO sensors consists of 4-electrode which provides signal where very low parts per billion (ppb) detection levels are required. Strong signal levels combined with low zero current allows resolution to < 10 (ppb) and a wide operating range (0 - 1000 ppm). The sensors operate using proven fuel cell technology.

Carbon dioxide

It is a solid electrolyte sensor having long operational life very ideal for urban outdoor/indoor air monitoring. It can generate a control signal based on a user-selectable threshold concentration, suitable for wide range selection (up to 5000 ppm). CO₂ Sensor is also designed for safety combustion and high CO₂ process control applications. These sensors are designed for Indoor/outdoor Air Quality, safety, combustion and high CO₂ process control applications.

Nitrogen Oxide

It is specially designed for high volume application. It has a strong signal level which combine with low zero current and gives a linear output. It provides a significant improvement in response to transient humidity changes.

Sulphur dioxide

The 4-electrode sensors provide signal where very low parts per billion (ppb) detection levels are required. Strong signal levels combined with low zero current allows resolution to < 10 (ppb) and a wide operating range (0 - 100 ppm).

Ozone (Oxidizing Gas and NO₂ Sensor)

The construction of this sensor is similar to CO Sensor where the 4-electrode sensors provide signal where very low parts per billion (ppb) detection levels are required. Strong signal levels combined with low zero current allows resolution to < 10 (ppb) and a wide operating range (0 - 20 ppm). The sensor continuously measures ozone ambient air at low ppb concentration. It is low sensitive to SO₂ and repeatable sensitive to NO₂.

6.6. Weather Sensors

Weather is made up of multiple parameters, including air temperature, atmospheric (barometric) pressure, humidity, precipitation, solar radiation and wind. Each of these factors can be measured to define typical weather patterns and to determine the quality of local atmospheric conditions. The environmental conditions produced by different weather parameters have an impact on the quality of the surrounding ecosystem. Weather elements form a chain reaction, as the impacts do not remain solely in the atmosphere. Consistently high temperatures can increase the heat transfer to local bodies of water in addition to heating the air. Likewise, a lack of precipitation affects not only weather conditions, but soil moisture and water levels due to evaporation. Wind speed and direction can be indicative of a front moving into the area, or it can create waves and encourage a stratified water column to mix.

Air Temperature and Humidity

It is ideal for measuring temperature from -40 to +70 °C and humidity range from 0 to 100% RH. It is suitable for fixed installation sensing heads, monitoring stations for outdoor applications. It is mounted above AQM21 System assembly.

Noise

Especially casted sound level transmitter is used to monitor the real time ambient noise. It can measure from 45 to 134 dB of noise. It is perfect for outdoor urban noise monitoring application.

Atmospheric Pressure

Aeron's barometric pressure sensor is a monolithic, signal conditioned, silicon pressure sensor. The combination of bipolar semiconductor processing and micromachining techniques provide accurate output. The sensor output is in voltage that is proportion to the applied pressure. The sensor has been temperature compensated over the entire temperature range and measure pressure up to 115 kPA.

UV radiation

The UV Sensor measures the sun burning portion of the UV spectrum. The sensor measures global solar UV irradiance, the sum of the components of solar UV transmitted directly and those scattered in the atmosphere. The sensor measures UV index from 0 - 16. It is mounted above AQM21 System assembly along with Temperature and humidity sensor.

Light

AQM21 uses light sensors which are suitable for outdoor and indoor mounting configurations and a measurement ranges up to 20,000 Lux. Custom ranges are also available. This is highly protected against outdoor conditions like intense light or dust. The sensor is mounted along with UV and Temperature humidity sensor above the AQM21 Assembly.

Particle Monitor

The sensor measures particles from 0.3 micron to 40 micron diameter accurately, repeatedly, and with minimal maintenance using the patented 'pump-less' design. A proven technology, the sensor provides both Particle readings and real-time particle size histograms, competing in performance with existing analytical units. Its improved aerodynamics with reduction of particle deposition, better low-end performance, extended upper size measurements and high / low flow rate digital selection. The optional flow profiler creates a sheath of clean air so very high particle concentrations can be measured without damaging the OPC.

6.7. Data logger



FIGURE 10: DATA LOGGER

AQM21 is equipped with a powerful and versatile data logger which can take simultaneous measurements from multiple sensors of various input/output types, communicating data securely to the web server to ease remote monitoring. Data can be logged for each parameter with the required configuration like maximum, minimum, cumulative, average or instant / current values.

7. AQM21 TECHNICAL SPECIFICATION

TABLE 1: TECHNICAL SPECIFICATIONS

PARAMETER NAME	PARAMETER VALUE
	LMR-AQM21
Environmental Parameters	
Pressure	15 to 115 kPa
Humidity	0 - 100% RH
Temperature	-25 °C to +70 °C
Wind Speed	0 to 170 mph
Wind Direction	0 to 359°
Noise	45 - 134 dB
UV Index	0 to 16
Noise	45 to 134 db
Light	10 - 2000 Lx
Gas Parameters	
CO	0 - 1000 ppm
CO ₂	0 - 5000 ppm
NO	0 - 20 ppm
O ₃	0 - 20 ppm
NO ₂	0 - 20 ppm
SO ₂	0 - 100 ppm
PM _{2.5}	0.35 to 40 µm
PM ₁₀	0 - 1000 ug/m3
Analog Inputs	
Resolution	24 bit
Type	Delta-Sigma
Accuracy	±0.06 % of FS at 30° C ±0.01 % of FS over the entire temperature range
Analog Sampling Rate	upto 200 Hz

PARAMETER NAME	PARAMETER VALUE
	LMR-AQM21
Network Interfaces	
Interfaces	Ethernet, Wi-Fi, LTE
Protocols	Ethernet / Wi-Fi / LTE: FTP, HTTP, HTTPS TCP: MODBUS
Frequency Band	FDD LTE: B1/B3 TDD LTE: B38/B39/B40/B41 TDSCDMA: B34/B39 WCDMA: B1 CDMA2000 1x/EVDO: BC0 GSM: 900/1800 Wi-Fi: IEEE 802.11 a/b/g/n, 2.4 GHz
Time Synchronization	GPS / Cellular / NTP/ Manual
Other Specifications	
Logging Data Rate	Minimum: 1 minute Maximum: 24 hours
LED Indicators	Power & Internet (located below AQM21 sensor assembly)
Electrical	
Input Voltage	+9 to +28 V DC
Power Consumption	<10 W
Batteries	Additional Accessory (to be purchased separately)
RTC	Onboard with 3V coin cell
Storage	
Internal Backup Memory	1 GB
SD Card Memory	(8 GB default) (expandable upto 32 GB)
USB	Data retrieval on a Pen Drive
Environment	
Temperature	-40 °C to +70 °C
Protection	IP65
Housing	Mild Steel
Dimensions	386 (W) mm × 550 (H) mm × 225 (D) mm
Weight	10.2 KG

8. MECHANICAL DIMENSIONS

All dimensions are in mm.

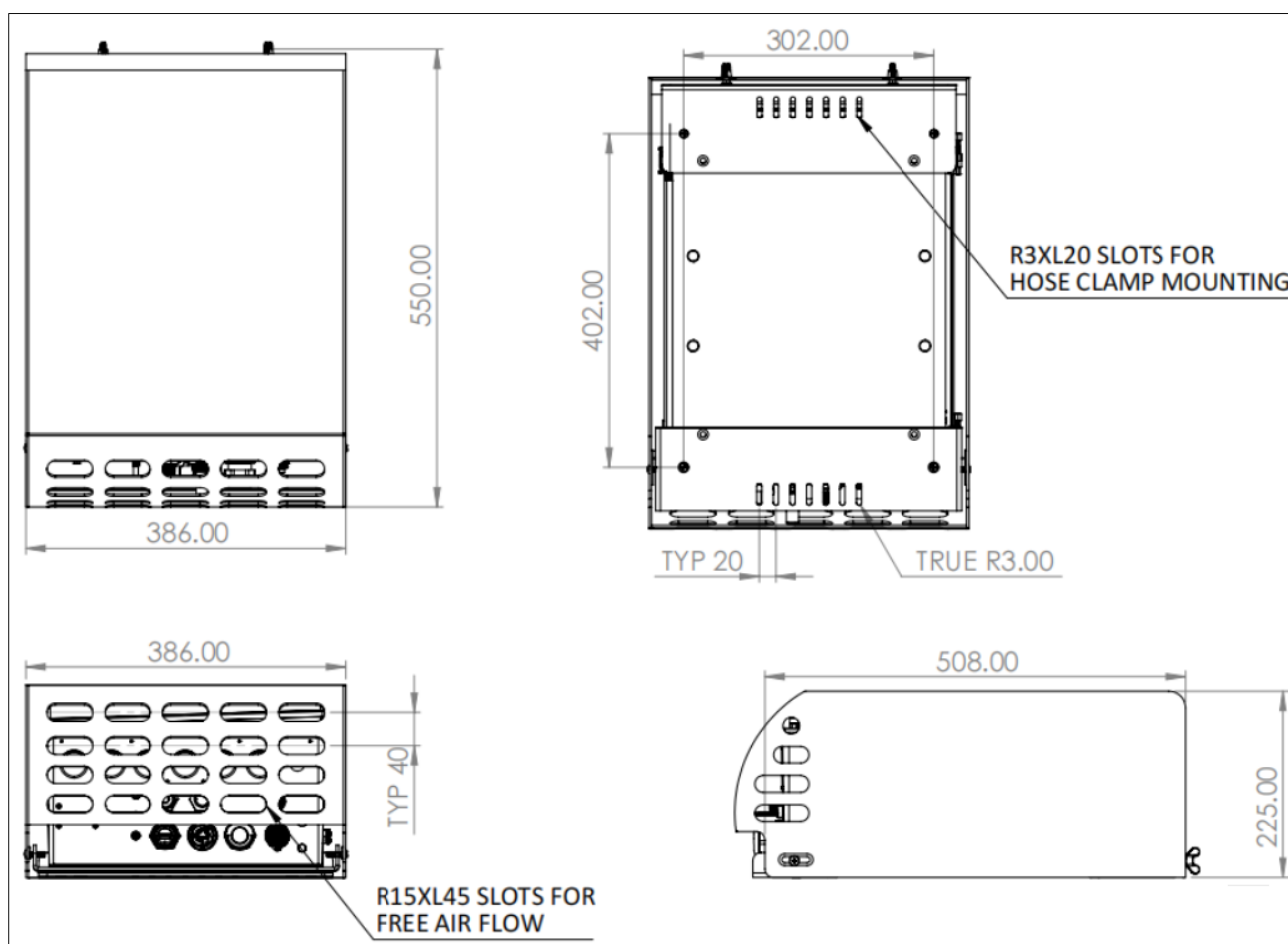


FIGURE 11: MECHANICAL DIMENSIONS

9. ORDERING INFORMATION

LMR-AQM21 (Product Code: 90002)

10. QUICK START

10.1. Component Check List

Following is the list of components provided in the package:

1. AQM21 sensors assembly with standard accessories
2. Datalogger
3. External Sensor Assembly
4. Mounting Brackets and Clamps
5. Micro SD card

10.2. Mounting

The device should be mounted at stationary platform away from obstacles. Mounting accessories should be tightened properly.

AQM21 comprises of 2 modules:

1. AQM21 Assembly
2. External Sensors Assembly

10.2.1. AQM21 Assembly

AQM21 to be mounted on a fixed pole with the help of 2 hose clamps. The preassembled brackets provided at the back of the sensor assembly has slots to route the clamps through the slots and mount with the pole. Clamps can be secured by using screwdriver. Figure A below shows a simple illustration of device on mounting.

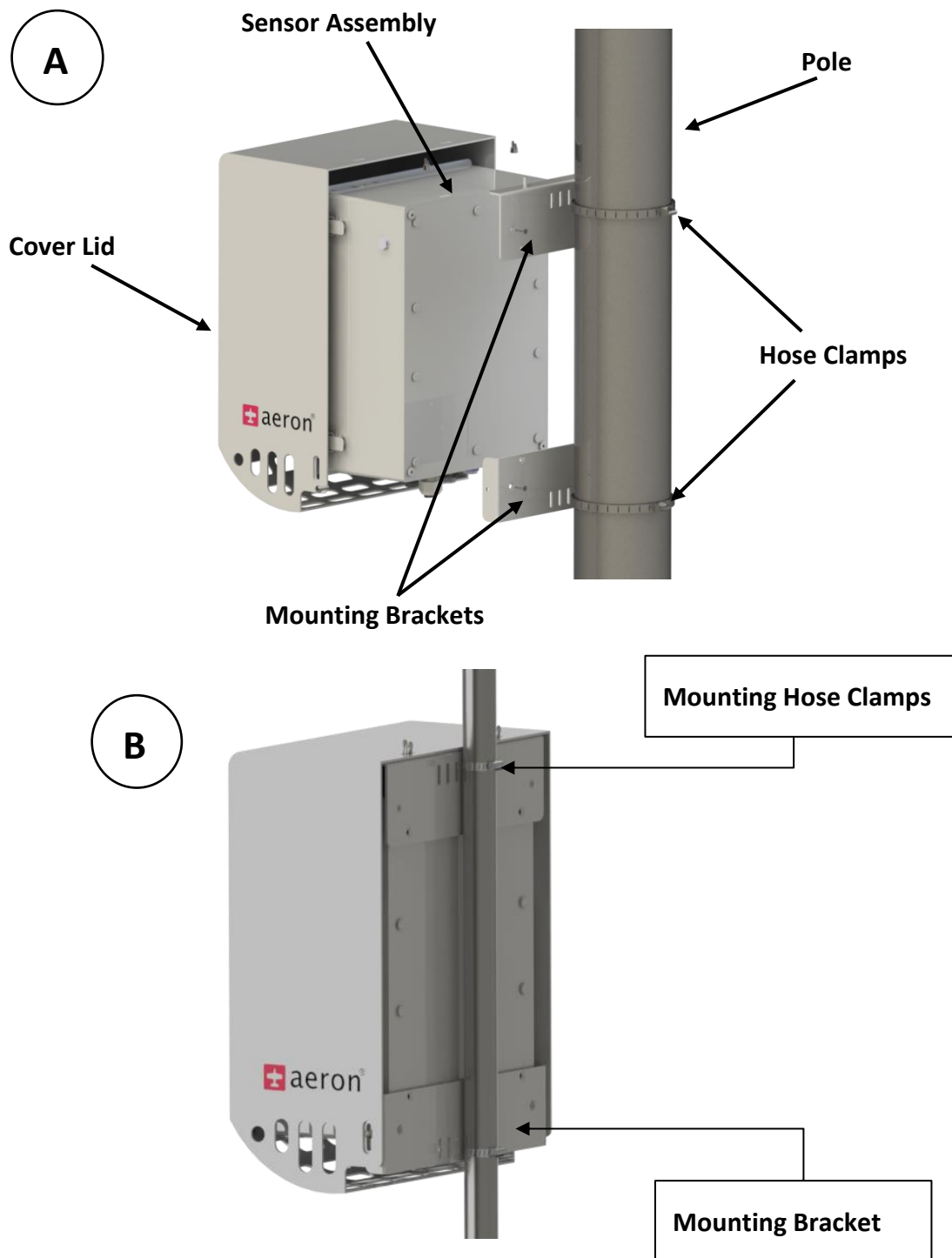


FIGURE 12: AQM21 ASSEMBLY

10.2.2. External Sensors Assembly

The external sensors assembly to be mounted with the help of hose clamps, similar to AQM21 assembly. It should be mounted above AQM21 assembly. Tighten the clamp with the help of screws.

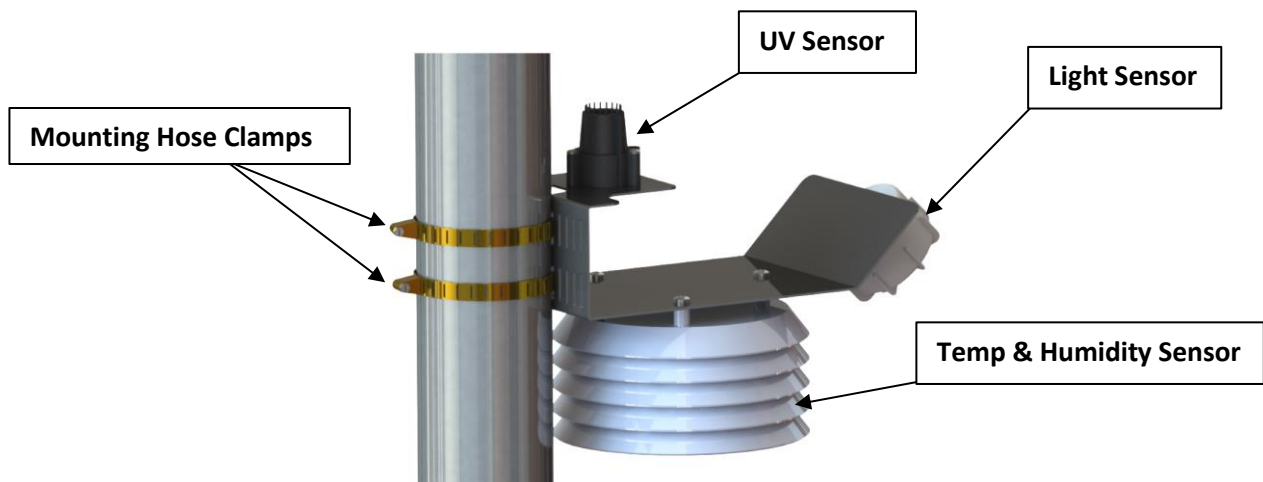


FIGURE 13: EXTERNAL SENSORS ASSEMBLY

Note:

The sensor (external/internal) assembly and arrangement may differ depending on the user requirements.

10.3. Accessing AQM-21 Assembly

Follow the steps to open the AQM21 Assembly:

1. Open the cover lid of the assembly by loosening the wing nut situated at the top (Fig A). Then unscrew the side screws. The top lid can be slide out from the slots and slide holes (Fig B).

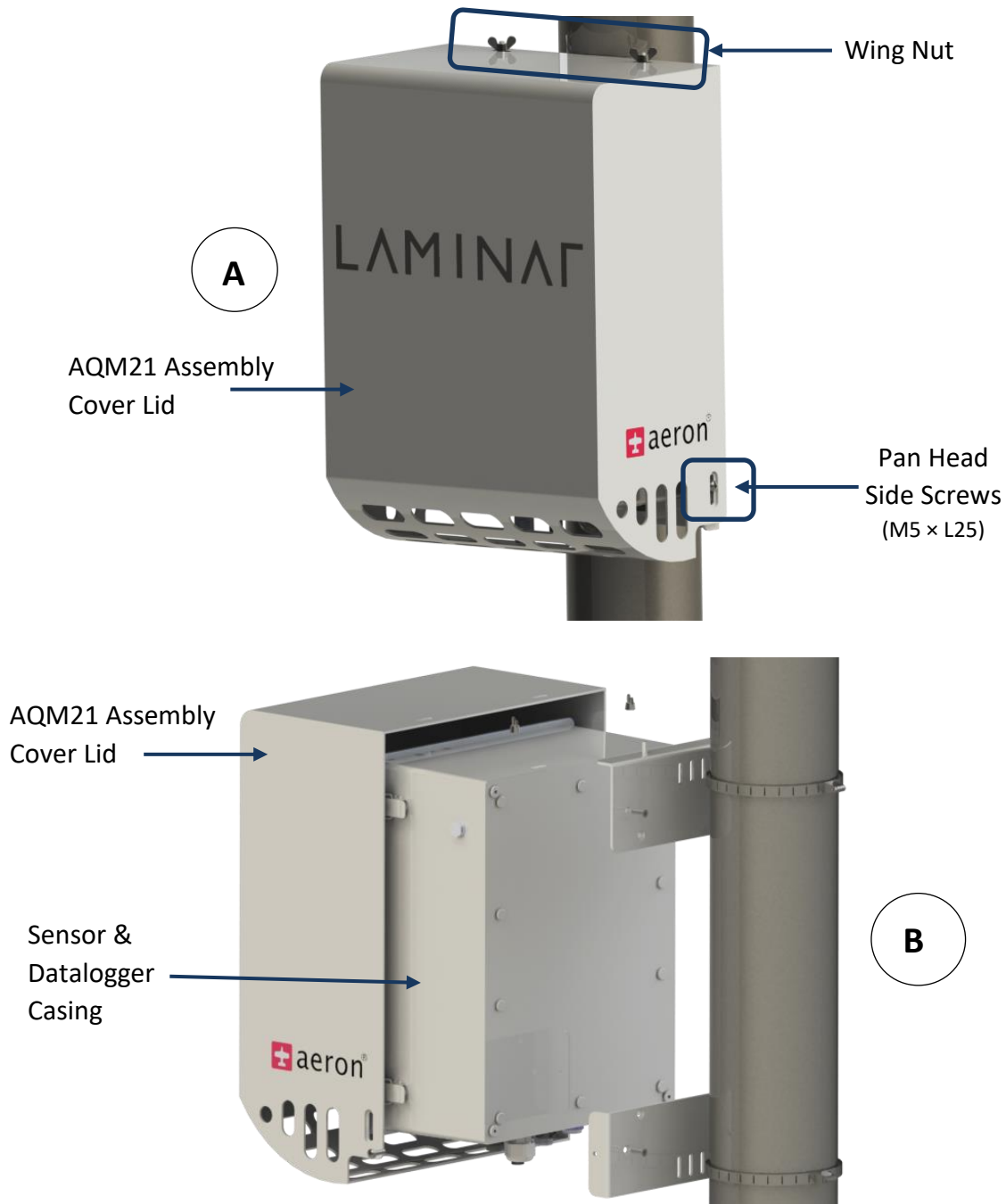


FIGURE 14: OPENING THE AQM21 ASSEMBLY - STEP 1

2. Rotate the clamp lever in an anticlockwise direction (towards hook) by pressing the bottom lock upward with the thumb (red outlined in below figure: A). This will disengage the clamp with the hook. Disengage both the clamps and the inner lid door can be open. The inner lid door has hinges on the side and clamps on the other side (fig B).

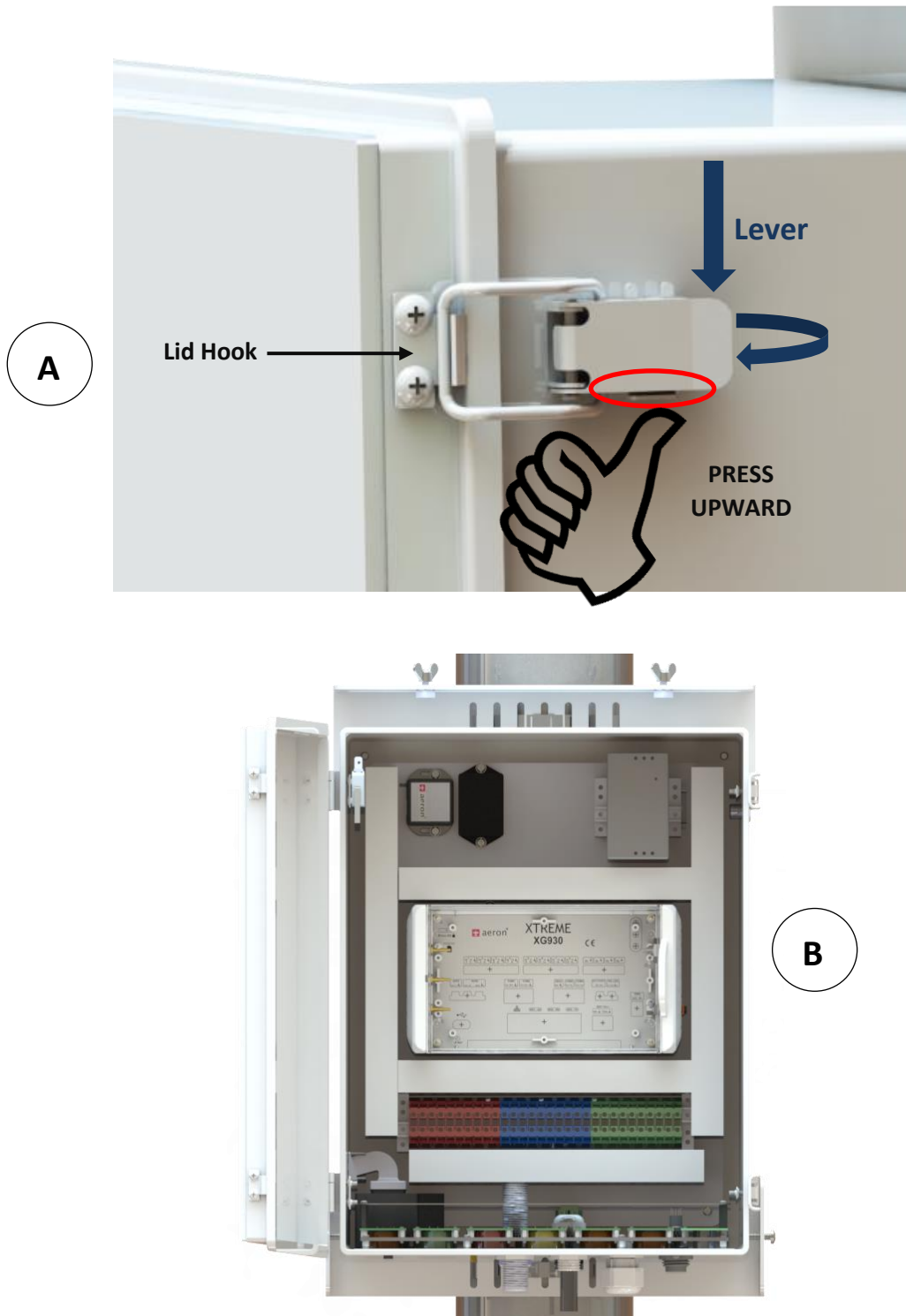


FIGURE 15: OPENING THE AQM21 ASSEMBLY - STEP 2

10.4. Accessing the Datalogger

Follow the below steps to open the enclosure of datalogger:

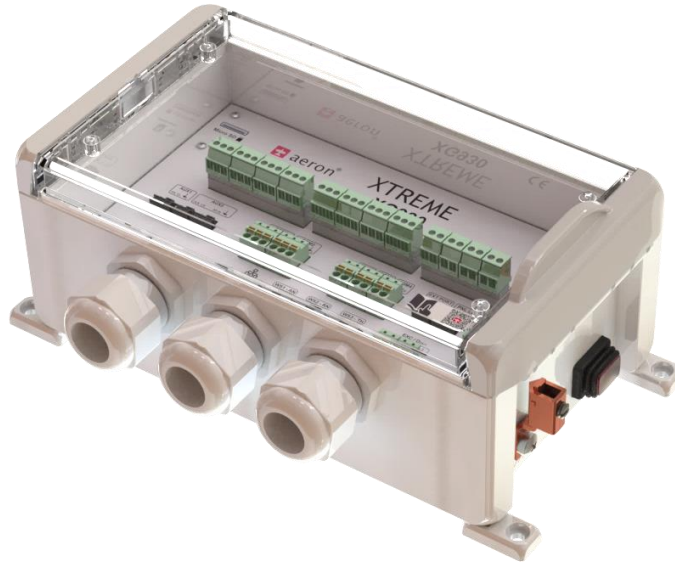


FIGURE 16: DATALOGGER

1. Gently pull the hand hinge, this will release the latch as shown in the below figure.

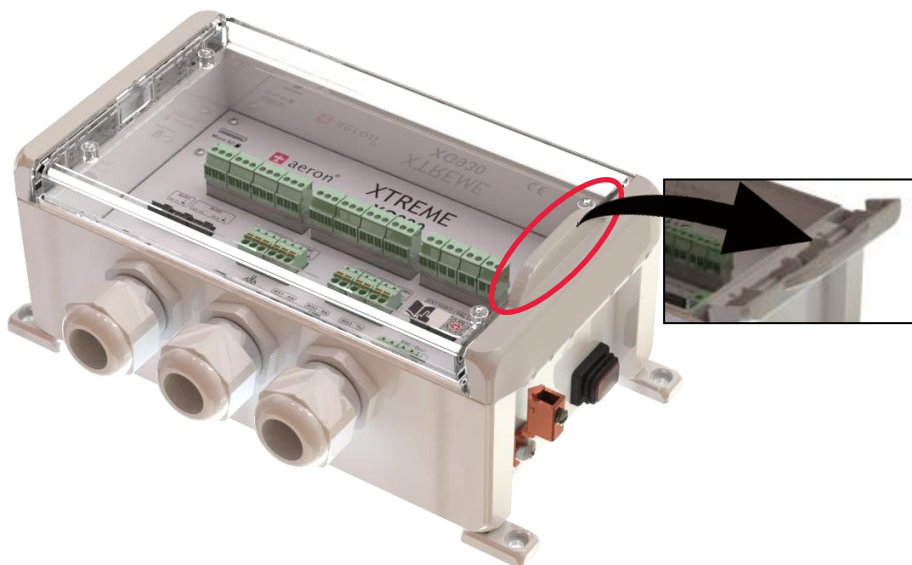


FIGURE 17: OPENING THE ENCLOSURE - STEP 1

2. The enclosure can now be opened.

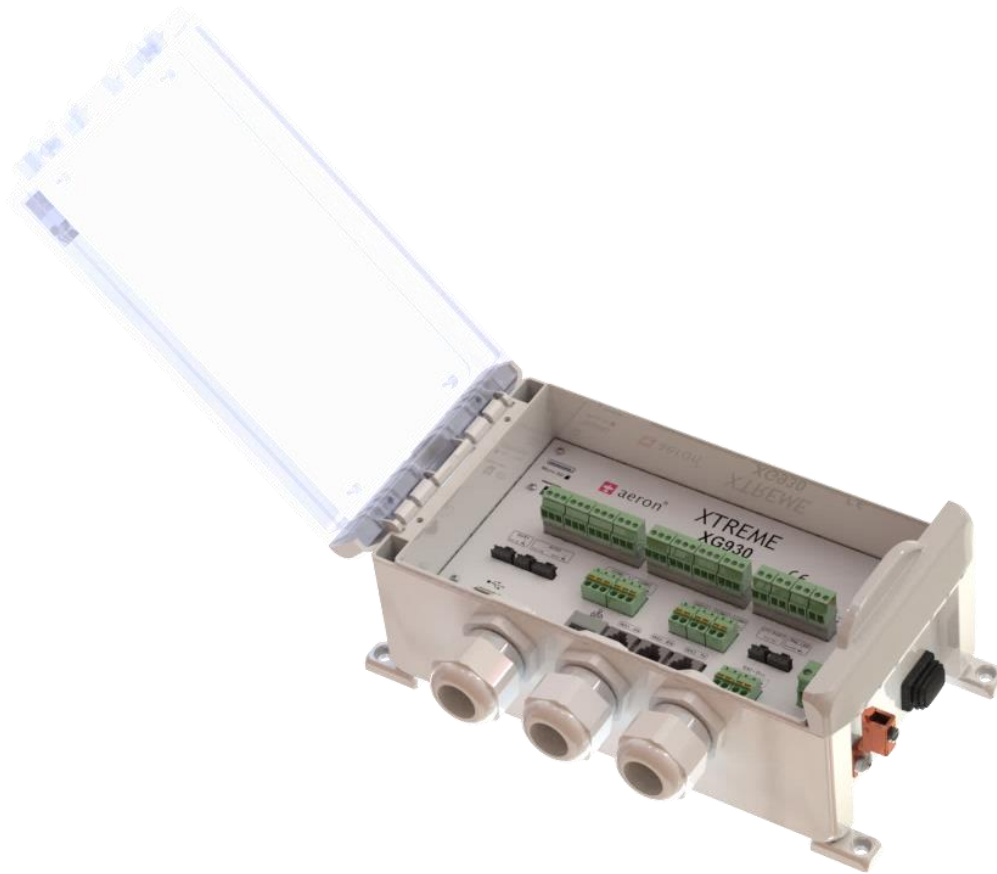


FIGURE 18: OPENING THE ENCLOSURE - STEP 2

10.5. Power Supply

- AQM21 requires external +9 to +28 V DC supply. A wiring diagram is provided along with the package. Make sure all the connections are made according to the diagram.
- Connect external power supply.
- Make sure that the power supply range is within +9 to +28 V DC and then switch ON the device. The red led at the bottom will glow and will continue to glow indicating the device has successfully powered up.
- Power switch is situated at the bottom of the Sensor assembly. Refer **FIGURE 8**.

10.6. LED Indicators

LED indicators are situated at the bottom of the AQM21 assembly inside bottom mesh and are visible even if the Bottom mesh is secured.

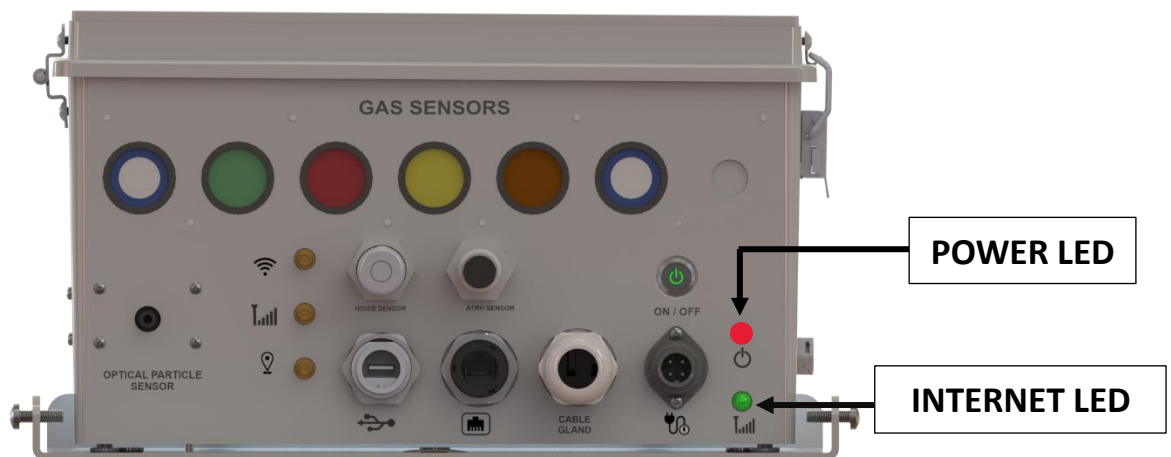


FIGURE 19: DEVICE LED INDICATORS

- **Power LED:**

RED LED will glow when the device is successfully powered ON.

- **Internet LED:**

GREEN LED will glow when the device has access to internet.

Note

Red Power LED will continue to glow throughout the normal operation of the device.

10.7. Antenna

GPS, Wi-Fi, and Cellular antennas are connected to respective connectors on the device.

GPS Antenna

The GPS antenna connector is located at the top on the device.

- Centre Frequency: 1575.42 MHz \pm 2 MHz
- V.S.W.R: 1.5:1
- Band Width: \pm 4 MHz

Wi-Fi antenna

The antenna provided with the AQM21 Assembly is 9 dBi magnetic Wi-Fi antenna.

- V.S.W.R: 2.0
- Gain-dB: 9 dBi

Cellular antenna

The antenna provided with the AQM21 Assembly is Cellular 9 dBi magnetic antenna.

- Frequency range (MHz): 800 MHz - 960 MHz, 1880 MHz - 1930 MHz
- V.S.W.R: 2.0
- Gain-dB: 9 dBi

Note:

*The status of the GPS fix, Wi-Fi and Cellular network is available through the symbols on local webpage.
Kindly refer section 11.1.3 for the same.*

10.8. Network

AQM21 has a provision of internet via Ethernet, Wi-Fi and Cellular network. The device can be connected to the LAN using the Ethernet / Wi-Fi.

- The device gets internet from 3 sources and has priority as Ethernet > Wi-Fi > Cellular network.
- If the device gets Internet over the Ethernet, Internet usage over Wi-Fi and Cellular modem will be OFF. The Device webpage will be accessible via Ethernet LAN.
- If the device does not get Internet over the Ethernet, device will try to connect to the internet available over Wi-Fi. If Wi-Fi is connected, the device webpage will be accessible via Wi-Fi LAN also.
- The device can still be connected in Ethernet LAN for accessing the webpage if Ethernet is connected between the two ends.
- If the device does not get Internet over the Ethernet and Wi-Fi, Cellular modem will switch ON its LTE / GPRS / UMTS data.
- The device can still be connected in Ethernet LAN for accessing the webpage if Ethernet is connected between the two ends.
- The device can still be connected in Wi-Fi LAN for accessing webpage if Wi-Fi settings are correctly updated in the device.
- In case the Ethernet cable is removed and there is no Wi-Fi range or Wi-Fi settings are incorrect in the device, the user will not have access to the webpage. If the SIM is inserted, the device will get Internet from Cellular network.
- The device can always receive / send SMS and show the network strength if a working SIM card is inserted in the device.

Note:

Ethernet has priority over Wi-Fi and Wi-Fi has priority over Cellular network for the internet access.

Ethernet, Wi-Fi, LTE Internet, cellular network strength, SIM, SD card status and GPS icons are displayed on the top right-corner of the webpage. Refer section **11.1.3** for the same.

10.9. SIM Card

The SIM card is to be inserted into the slot provided on the left top corner of the datalogger (below the Micro SD card slot). Nano sized SIM card needs to be used for the AQM21.

Steps to insert the SIM card

1. Open the enclosure of datalogger. Refer section **10.4** for enclosure opening procedure.
2. Take the activated SIM card and insert it in the slot with the orientation as shown on the device.
3. Refer below figure for details.



FIGURE 20: INSERTING SIM CARD

Note:

*The device may take up to 5 mins to detect after SIM insertion process. The status of the SIM card after insertion, is available through the symbols on the local webpage. Refer section **11.1.3** for the same.*

10.10. Storage

SD Card: The device stores data in SD card. A micro SD card of size up to 32 GB can be used in the device. The SD card should be only in the 'EXT4' format. The process of inserting the SD card is given in below section.

Note:

SD Card should be only in the EXT4 format.

10.10.1. Inserting SD Card

The SD Card is to be inserted in the slot provided at the at the left top corner of the datalogger.

1. Open the enclosure. Refer section **10.4** for enclosure opening procedure.
2. Take the Micro SD card and insert it in the slot with the orientation as shown on the device.
3. Refer below figure for details.

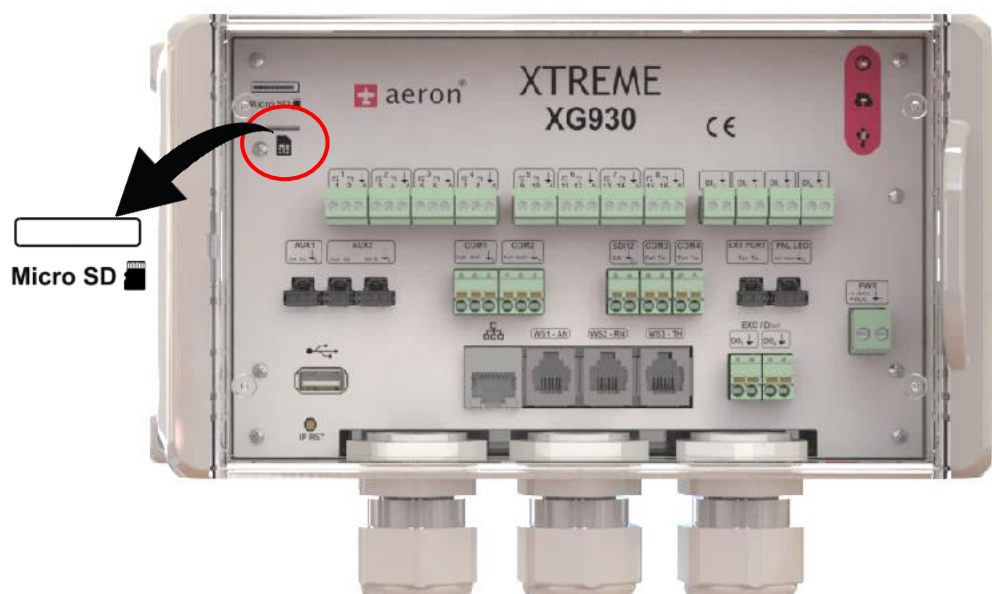


FIGURE 21: INSERTING SD CARD

Note:

*The status of the SD card is available through the symbols on the webpage. Please refer section **11.1.3** for the same.*

10.11. IP Reset

This feature is useful if device webpage is not accessible with multiple attempts through the steps mentioned in the section 11.1.

Always make sure LED on Ethernet connector is blinking. If not, ensure that the Ethernet cable is properly connected at both ends.

IP Reset button can be pressed when:

1. Device is not accessible with known hostname.
2. Device is not accessible with previous known IP.
3. Device is not visible in the network.
4. Device is not responding to ping requests.
5. If the device IP or hostname is unknown.

Steps to be performed after the IP Reset button is pressed:

1. When IP reset button is pressed, IP 192.168.1.185 is set on device.
2. Connect device to a computer having static IP address in same subnet range.
E.g.: 192.168.1.186.
3. Now webpage should be accessible through the computer.
4. Once device is accessible after IP reset, user can change the IP address through webpage if required.

Note:

Set correct gateway address (for static IP) for device to get access to internet.

Accessing the IP Reset Button:

The IP reset button is placed at the left bottom side of the datalogger (Refer section Error! Reference source not found. for cover plate removal procedure.)

Steps to Access the IP Reset Button:

1. Open the enclosure of datalogger. (Detailed procedure is mentioned in 10.4)
2. Use a screwdriver head and gently press the IP Reset button for 2 secs.



Press the IP reset switch
using screwdriver

FIGURE 22: IP RESET

11. WORKING

1. AQM21 helps in assessing the level of pollution in relation to the ambient air quality standards. The device is configured with Air Quality Indexing (AQI) related gas and particle sensors.
2. The system measures relative humidity, ambient temperature and levels of carbon dioxide (CO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), oxygen (O₂), ozone (O₃) and other flammable, hazardous or toxic gases. These sensors are connected to the system over analog channels. The system also measures the particulate matter content PM2.5 and PM10. These sensors are connected to the system over auxiliary analog channel.
3. The data from various sensors is received as inputs on analog, digital and serial communication channels.
4. The data is sampled, filtered, processed, and then stored in memory.
5. The data obtained from above sensors is uploaded to the server and is used to calculate the Air Quality Index (AQI). It can also be viewed on local webpage and can be downloaded through USB port.
6. Output is available on RS232, RS485 and Ethernet, Wi-Fi and LTE.
7. The system is capable of storing data in the form of '.csv' in SD card at logging interval of 1 minute to 1 day, and also send data to the configured server at update interval starting from 1 minute.
8. Time synchronization is achieved through the built-in GPS receiver or internet. The time can also be set manually.

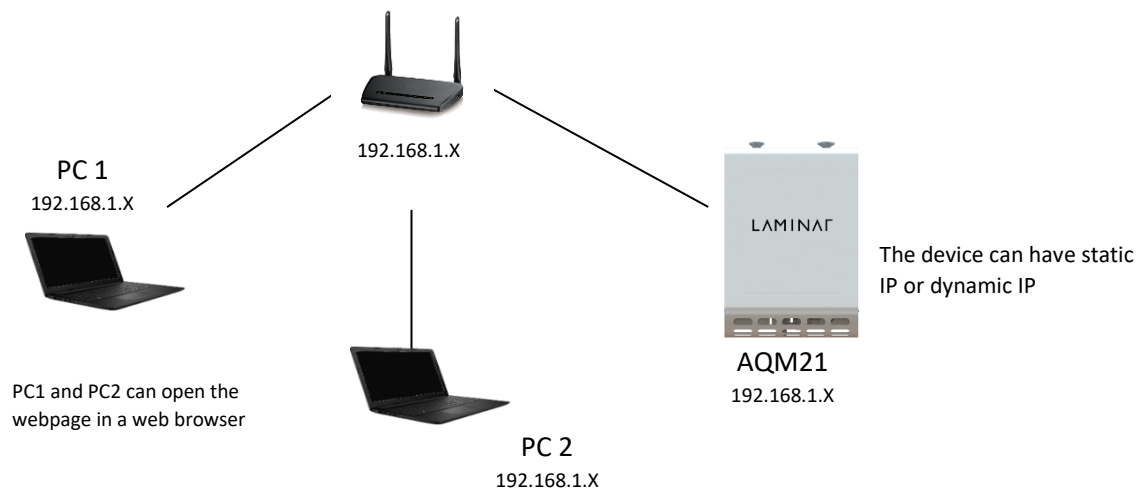
11.1. Accessing Device through Local Webpage

The configuration of the device is the next step after powering ON the device. The AQM21 can be configured using the local Webpage.

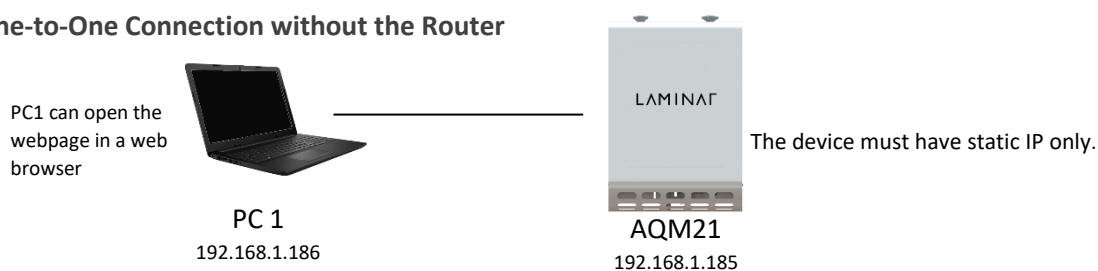
Following are the steps to be taken for configuration of the AQM21 for the first-time using Webpage:

1. Follow steps mentioned in section 10.5 to power ON the device. Once the Red LED glows, device is ready for operation.
2. Connect the Ethernet cable from the device to the LAN or to the computer. Refer below figure for the connections.
3. Check if the LEDs on Ethernet connector are ON. It indicates that Ethernet is properly connected.
4. If the LED is OFF, check the Ethernet connections again.
5. Open the web browser on a PC. Make sure that the PC is connected to the same LAN as of the device or make a one-to-one connection of the device and the PC.

Getting the Device in LAN with the Router



One-to-One Connection without the Router



Note: The IP mentioned above are for representation purpose only.

FIGURE 23: CONNECTING AQM21 TO OPEN THE WEBPAGE

6. To set up the device one to one connection with computer, static IP needs to be set on computer.

Follow the steps to set up static IP address :

- I. Connect the ethernet cable between computer and device.
- II. Go to **Network & Internet settings => change adapter options**
- III. Right click on local area connection and select '**Properties**' as shown in the below figure.

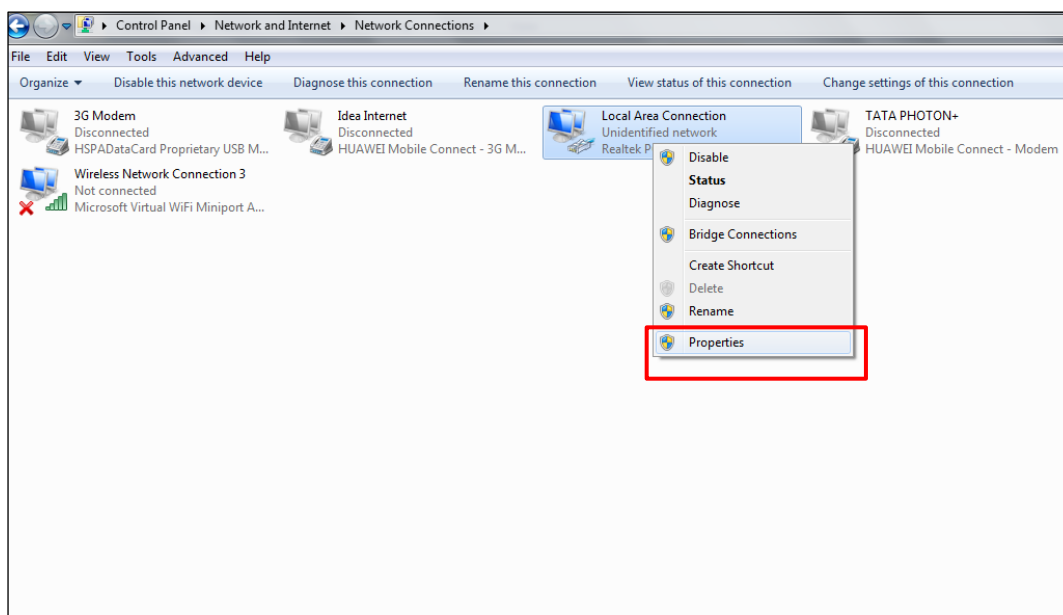


FIGURE 24: SETTING STATIC IP ADDRESS - 1

- IV. Select 'IPV4 settings' and click on 'Properties'.

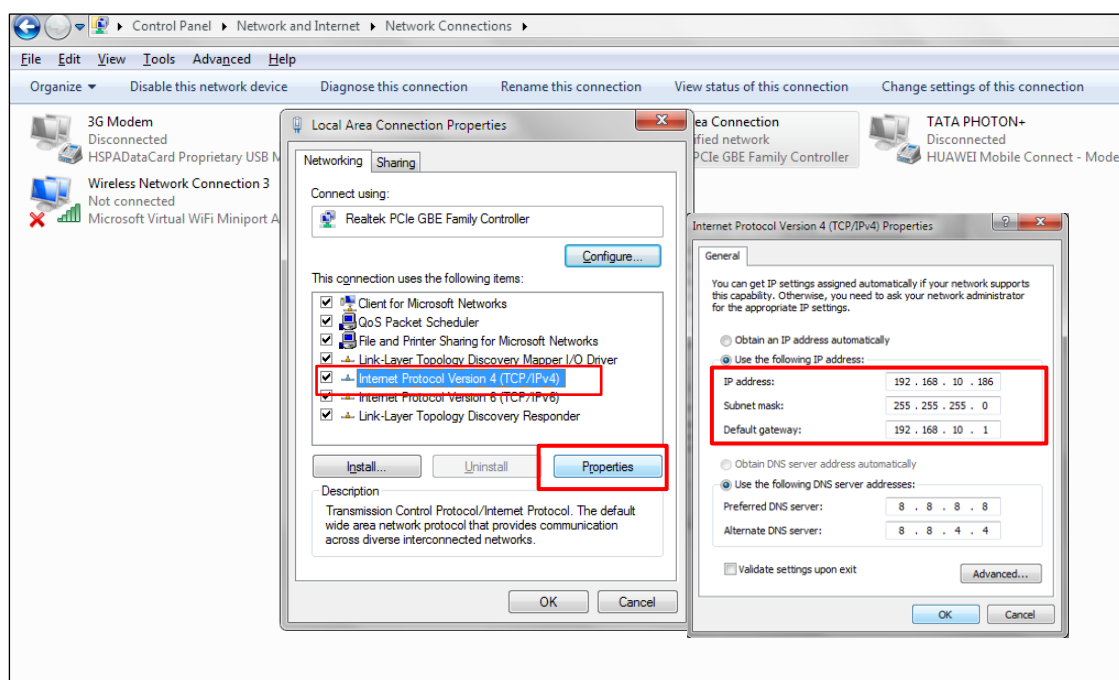


FIGURE 25: SETTING STATIC IP ADDRESS - 2

- V. A new dialog box will appear to set the IP manually. Enter appropriate **IP address**,
Subnet mask and **gateway address**. **DNS setting** is optional.
- VI. Select '**OK**'. IP settings are now applied on the computer.

Note: Above setting for static IP is with respect to windows operating system.

7. Type `http://Hostname.local` in the web browser for logging into the Webpage.

Note:

'Hostname' refers to the name of the device. Default hostname will be the USN of the device.

E.g. For device with USN 12345678910112, type "`http://12345678910112.local`" in the browser and press enter.

8. The login page is visible on the web browser as shown below.

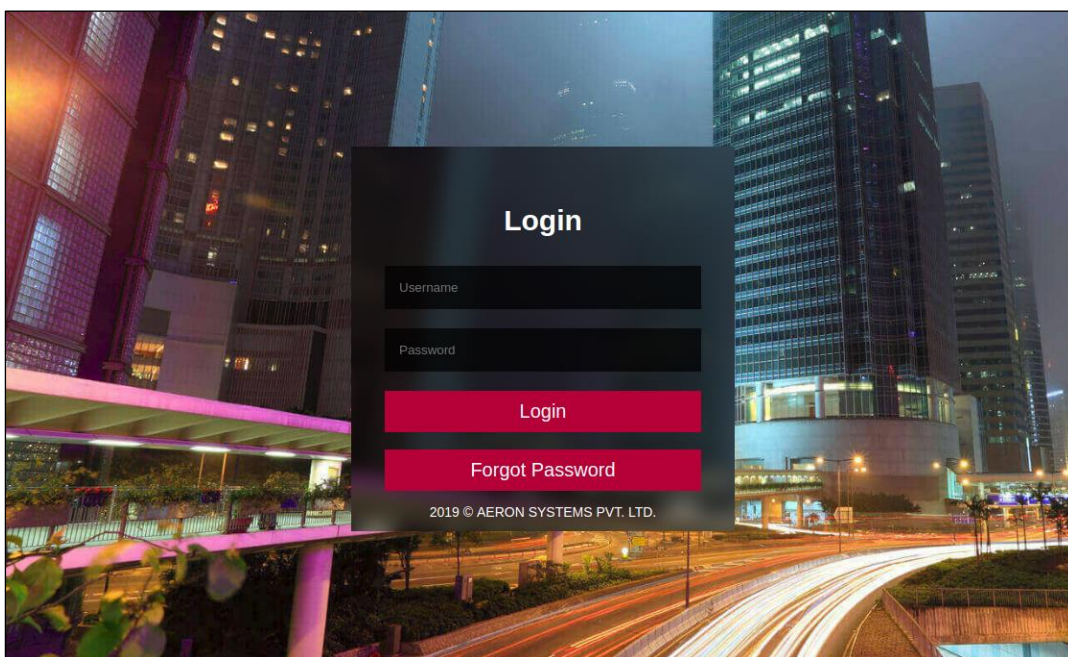


FIGURE 26: WEBPAGE - LOGIN PAGE

Note:

If the webpage is unavailable, use any IP scanner software then check whether the device is visible in the network. If the device is not visible, please follow the IP Reset procedure given in the section 10.11.

9. Login to the webpage with the credentials below:

Note:

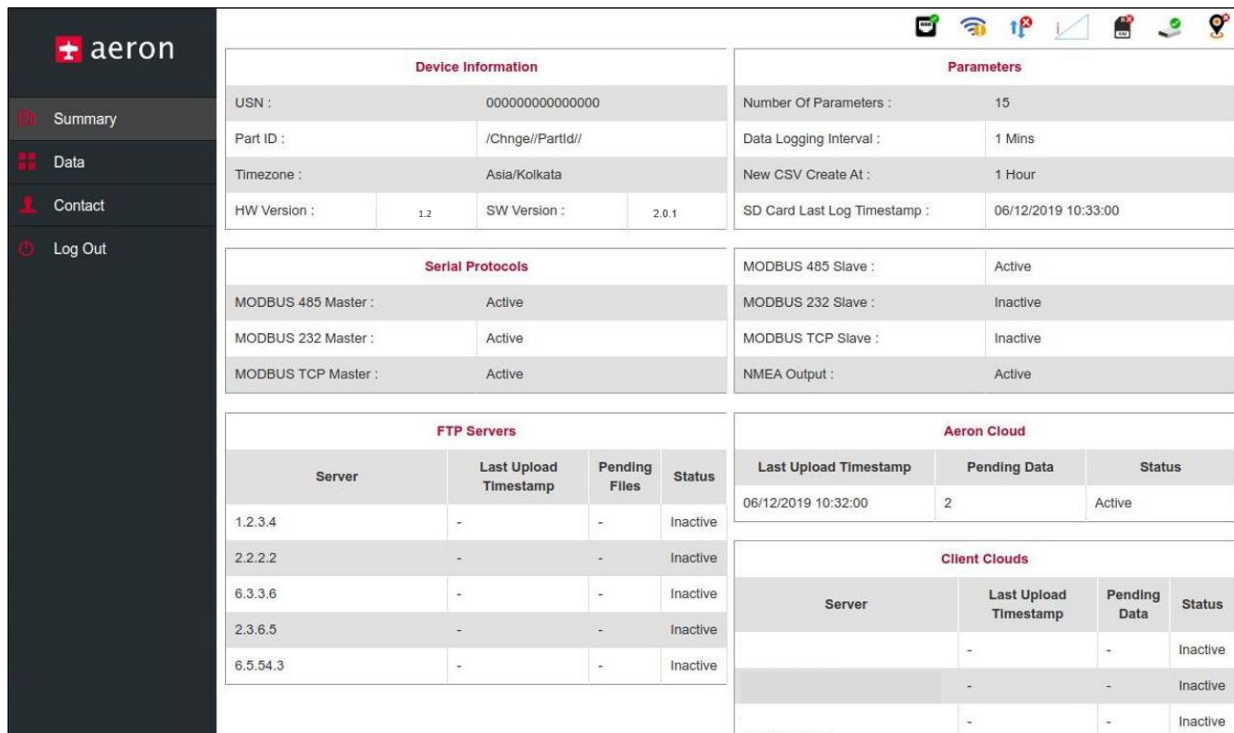
Following are the default credentials for the first login for user account

Login ID: user | Password: user@123

Please change the password after the first login.

Note: The user has access to Summary Page and Data Page to view and download the logged data. The user account does not have permissions to modify the configurations.

10. After successful login, the Summary Page will be visible as shown in below figure.



Device Information

USN :	0000000000000000		
Part ID :	/Chnge//Partid//		
Timezone :	Asia/Kolkata		
HW Version :	1.2	SW Version :	2.0.1

Parameters

Number Of Parameters :	15
Data Logging Interval :	1 Mins
New CSV Create At :	1 Hour
SD Card Last Log Timestamp :	06/12/2019 10:33:00

Serial Protocols

MODBUS 485 Master :	Active
MODBUS 232 Master :	Active
MODBUS TCP Master :	Active

FTP Servers

Server	Last Upload Timestamp	Pending Files	Status
1.2.3.4	-	-	Inactive
2.2.2.2	-	-	Inactive
6.3.3.6	-	-	Inactive
2.3.6.5	-	-	Inactive
6.5.54.3	-	-	Inactive

Aeron Cloud

Last Upload Timestamp	Pending Data	Status
06/12/2019 10:32:00	2	Active

Client Clouds

Server	Last Upload Timestamp	Pending Data	Status
-	-	-	Inactive
-	-	-	Inactive
-	-	-	Inactive

FIGURE 27: WEBPAGE - SUMMARY PAGE

11. Basic device information like USN (Unique Serial Number), Part ID, time zone, parameters, serial protocols status and web services status are displayed on this page.

11.1.1. Summary Page

The summary page consists of the following tabs:

- **Device Information:** Device USN, Part ID, Time zone, HW and SW versions are displayed.
- **USN:** A unique serial number is given to each device.
- **Parameters:** Total configured parameters with update or logging time are displayed here. New CSV creation time or interval and SD card last log timestamp are also displayed here.
- **Serial Protocols:** Serial protocols status is displayed here.

- **Device serial modes are:**

1. MODBUS RS485 Master
2. MODBUS RS232 Master
3. MODBUS TCP Master
4. MODBUS RS485 Slave
5. MODBUS RS232 Slave
6. MODBUS TCP Slave
7. NMEA Output

- **FTP Servers:**

Details of Server, Last upload Timestamp, Pending Files and Status are displayed:

1. IPs of the configured FTP servers.
2. Last Upload Timestamp: It will display the details of last uploaded file Date and Time.
3. Pending Files: It will display number of pending files.
4. Status of the Server (Active / Inactive).

- **Aeron Cloud:**

Details of Last upload Time stamp, Pending Data and Status are displayed:

1. Last Upload Timestamp: It will display data details of last uploaded date and time.
2. Pending Data: It will display number of pending data packets.
3. Status of the Server (Active / Inactive).

- **Client Clouds:**

Details of Server, last upload timestamp, pending data and status are displayed:

1. IPs of the configured Client Clouds server.
2. Last Upload Timestamp: It will display data details of last uploaded date and time.
3. Pending Data: It will display number of pending data packets.
4. Status of the Server (Active / Inactive).

11.1.2. Data

Show data: Data is displayed on webpage according to the selected date. Select the period for which the data is to be displayed. The data will be displayed in tabular form.

Download: The data for the selected duration will be available in CSV file format for downloading. The data is downloaded in a '.zip' file which contains the compressed '.csv' files.

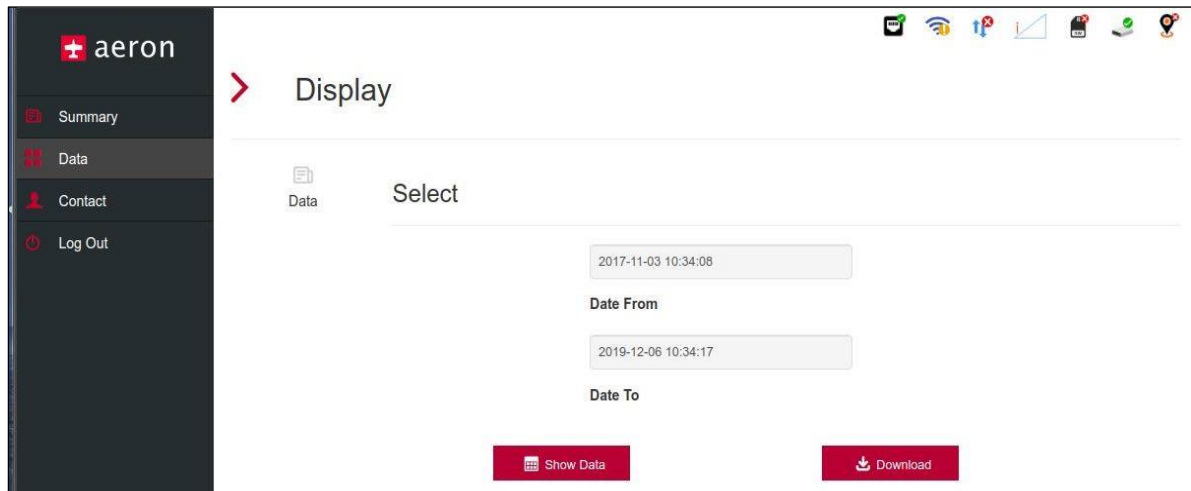
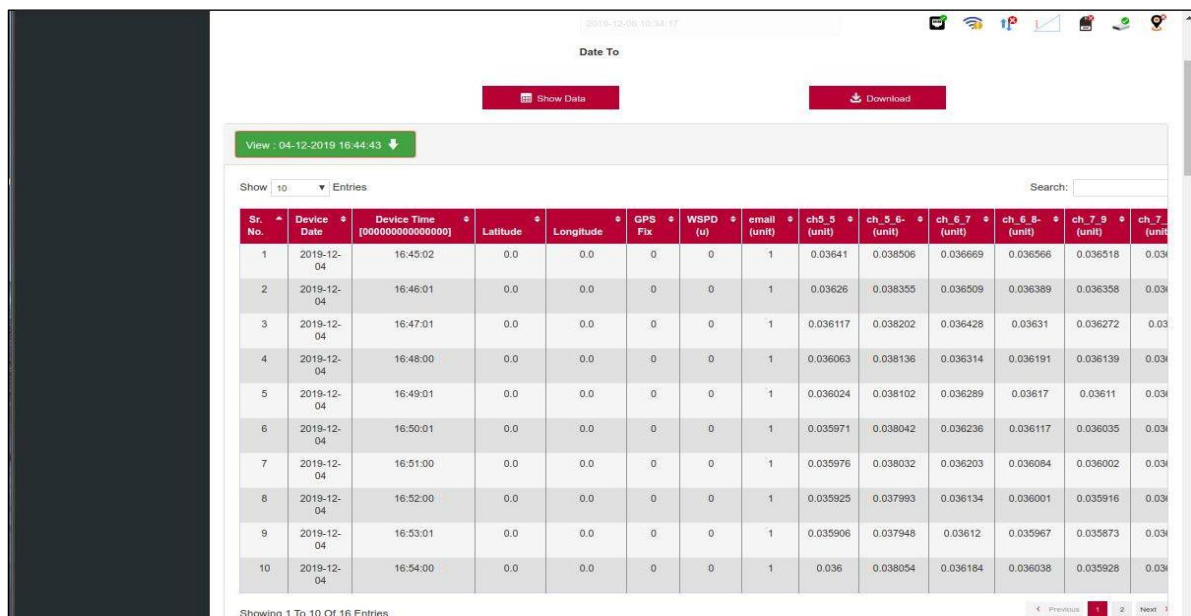


FIGURE 28: DATA PAGE - USER



Sr. No.	Device Date	Device Time [0000000000000000]	Latitude	Longitude	GPS Fix	WSPD (u)	email (unit)	ch. 5.5 (unit)	ch. 5.6 (unit)	ch. 6.7 (unit)	ch. 6.8 (unit)	ch. 7.9 (unit)	ch. 7.10 (unit)
1	2019-12-04	16:45:02	0.0	0.0	0	0	1	0.03641	0.036506	0.036669	0.036566	0.036518	0.036518
2	2019-12-04	16:46:01	0.0	0.0	0	0	1	0.03626	0.036355	0.036509	0.036389	0.036358	0.036358
3	2019-12-04	16:47:01	0.0	0.0	0	0	1	0.036117	0.036202	0.036428	0.03631	0.036272	0.036272
4	2019-12-04	16:48:00	0.0	0.0	0	0	1	0.036063	0.036136	0.036314	0.036191	0.036139	0.036139
5	2019-12-04	16:49:01	0.0	0.0	0	0	1	0.036024	0.036102	0.036289	0.03617	0.03611	0.03611
6	2019-12-04	16:50:01	0.0	0.0	0	0	1	0.035971	0.036042	0.036236	0.036117	0.036035	0.036035
7	2019-12-04	16:51:00	0.0	0.0	0	0	1	0.035976	0.036032	0.036203	0.036084	0.036002	0.036002
8	2019-12-04	16:52:00	0.0	0.0	0	0	1	0.035925	0.037993	0.036134	0.036001	0.035916	0.035916
9	2019-12-04	16:53:01	0.0	0.0	0	0	1	0.035906	0.037948	0.03612	0.035967	0.035873	0.035873
10	2019-12-04	16:54:00	0.0	0.0	0	0	1	0.036	0.038054	0.036184	0.036038	0.035928	0.035928

FIGURE 29: DATA IN TABULAR VIEW - USER

11.1.3. Symbols

Symbols indicate the status of the system. These symbols are visible on the top right corner of the webpage.

Ethernet



- Ethernet not connected.



- Ethernet connected, Internet available on Ethernet.



- Ethernet connected, Internet not available on Ethernet.

Note:

The Ethernet symbols are not visible when the Internet is available through the Wi-Fi / cellular network.

SIM Card



- SIM Card not detected.



- SIM Card not registered.

Note:

If SIM is detected and registered to cellular network, SIM card symbols are not visible.

GPS



- GPS Disabled.



- GPS location obtained, hovering over this icon shows position details. The GPS location is obtained at the latest GPS interval.



- GPS location not obtained.

Network Strength



- No network.



- Network strength very low.



- Network strength low.



- Network strength good.



- Network strength excellent.

Cellular Network



- Cellular network not available.



- Cellular network available. This symbol is visible in case the device is not able to recognize the network type.



- Internet not available on the Cellular network.



- Network type 2G (GSM / GPRS / EDGE) available.



- Network type UMTS (WCDMA or HSDPA or HSUPA or HSPA+ or TDSCDMA) available.



- Network type LTE (TDD LTE or FDD LTE) available.

Note:

The cellular network symbols are not visible when the Internet is available through the Ethernet / Wi-Fi.

SD Card



- SD Card not mounted.



- SD Card mounted and accessible. Hovering over this icon shows the size of the used memory.



- SD Card mounted but not accessible.

Wi-Fi



- Wi-Fi connected, Internet available on Wi-Fi.



- Wi-Fi connected, Internet not available on Wi-Fi.

11.2. Data Retrieval

Local Data Retrieval

The data can be retrieved from the data menu on local webpage. Enter the period of the data to be retrieved and click '**Download**'.

The data will be downloaded in the '**.csv**' format to the connected computer.

Pen Drive

The logged parameters data in the device can be retrieved by connecting the pen drive to the USB port provided at the bottom section of AQM21 (procedure of USB connectivity is mentioned in section 13).

Real Time Data Retrieval

Real time data can be retrieved either as NMEA string containing comma separated value of parameters or can be collected over MODBUS slave by requesting MODBUS query.

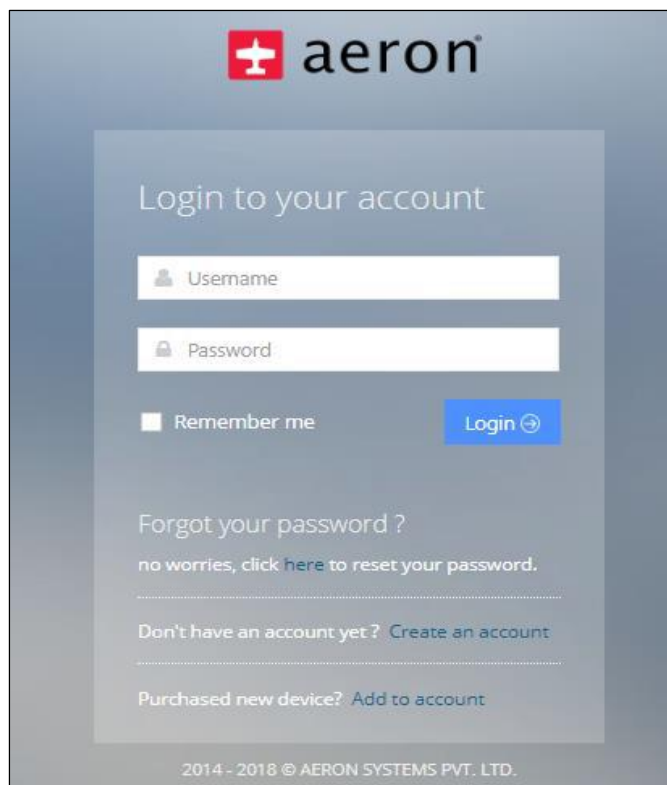
Modbus slave can provide data over TCP, RS485 and RS232 with a configured polling interval.

Remote Data Retrieval

Real time data for logged parameters can be retrieved over data cloud website. Refer section 11.3.

11.3. Data Cloud (Web Portal)

Login to Aeron Data Cloud (www.datacloud.aeronsystems.com) with provided user-ID and password. Contact Aeron support for subscription to Aeron data cloud portal. Please refer to the Web Portal Manual available in the download section on the Aeron's website.



The screenshot shows the Aeron Data Cloud login interface. At the top is the Aeron logo. Below it, the heading "Login to your account" is displayed. There are two input fields: "Username" and "Password". Below the password field is a checkbox labeled "Remember me" and a blue "Login" button with a right-pointing arrow. Below the login fields, there are three links: "Forgot your password? no worries, click [here](#) to reset your password.", "Don't have an account yet? [Create an account](#)", and "Purchased new device? [Add to account](#)". At the bottom, the copyright notice "2014 - 2018 © AERON SYSTEMS PVT. LTD." is visible.

FIGURE 30: CLOUD LOGIN

11.3.1. Dashboard

To access the Dashboard, follow below steps.

1. Login with the credentials as mentioned in section 11.3. The station list is displayed after successful login.
2. Enter USN in search text box.
2. Click on **View** button in Actions column. Refer below **FIGURE 31**.
3. The device dashboard (**FIGURE 32**) displays the device health parameters.

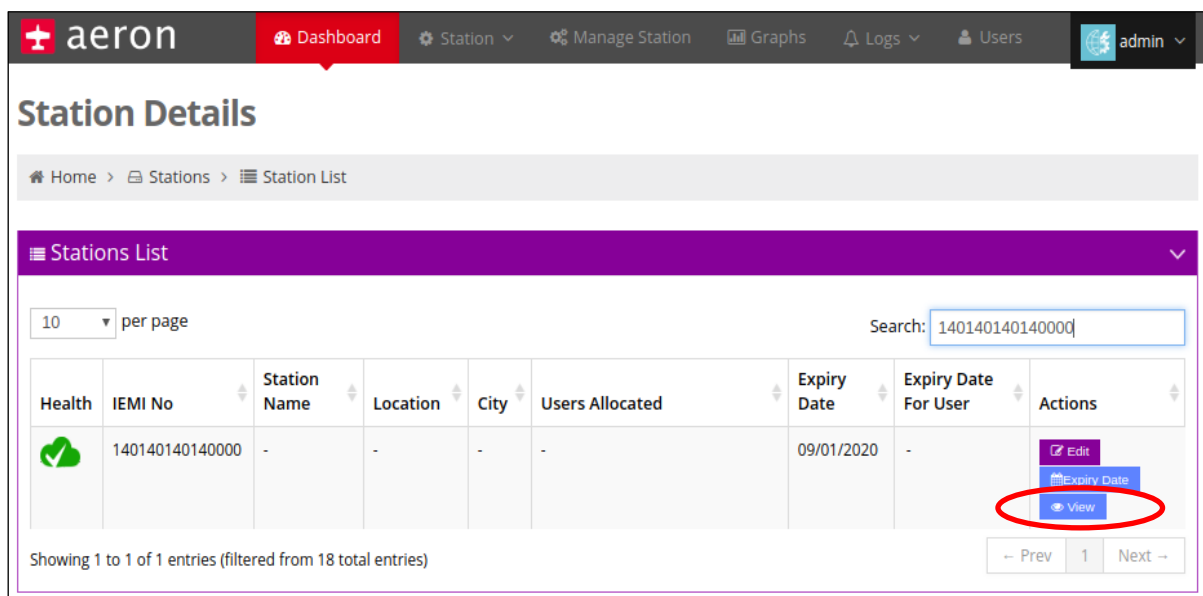


FIGURE 31: DEVICE SEARCH WITH USN

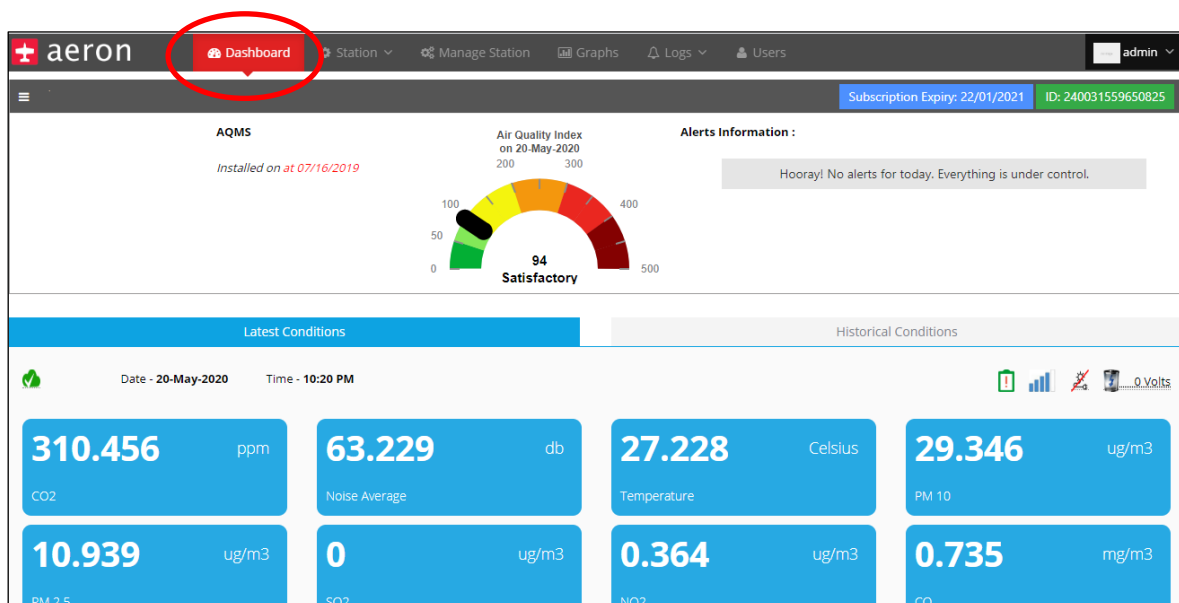
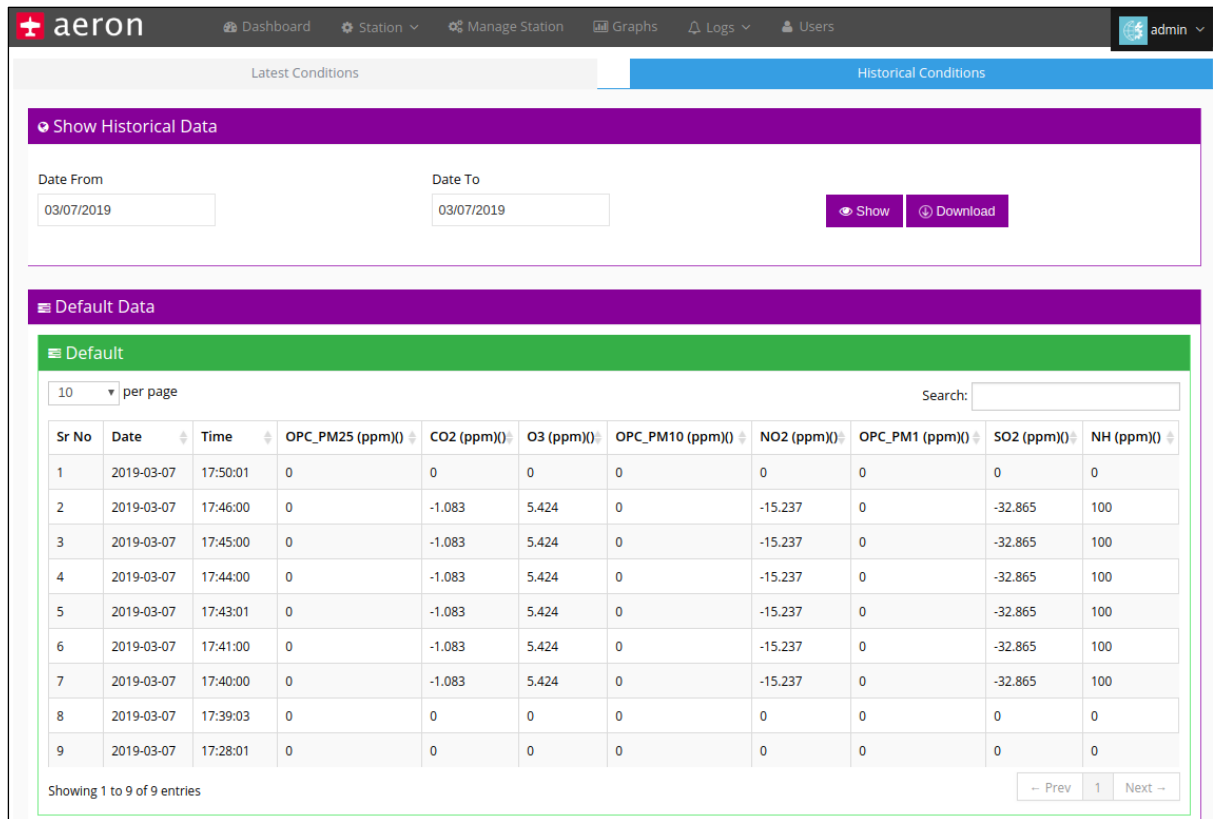


FIGURE 32: DEVICE DASHBOARD

11.3.2. Data History

The data history can be observed from the web portal as shown below.



Latest Conditions

Historical Conditions

Show Historical Data

Date From: 03/07/2019 Date To: 03/07/2019

Show Download

Default Data

Default

10 per page Search:

Sr No	Date	Time	OPC_PM25 (ppm)	CO2 (ppm)	O3 (ppm)	OPC_PM10 (ppm)	NO2 (ppm)	OPC_PM1 (ppm)	SO2 (ppm)	NH (ppm)
1	2019-03-07	17:50:01	0	0	0	0	0	0	0	0
2	2019-03-07	17:46:00	0	-1.083	5.424	0	-15.237	0	-32.865	100
3	2019-03-07	17:45:00	0	-1.083	5.424	0	-15.237	0	-32.865	100
4	2019-03-07	17:44:00	0	-1.083	5.424	0	-15.237	0	-32.865	100
5	2019-03-07	17:43:01	0	-1.083	5.424	0	-15.237	0	-32.865	100
6	2019-03-07	17:41:00	0	-1.083	5.424	0	-15.237	0	-32.865	100
7	2019-03-07	17:40:00	0	-1.083	5.424	0	-15.237	0	-32.865	100
8	2019-03-07	17:39:03	0	0	0	0	0	0	0	0
9	2019-03-07	17:28:01	0	0	0	0	0	0	0	0

Showing 1 to 9 of 9 entries

Prev 1 Next

FIGURE 33: DEVICE DATA HISTORY

- Data can be download by clicking the 'Download' button.
- The data downloaded from the server, is obtained in the .csv (Excel) format. The CSV file can be opened in spreadsheet utility.

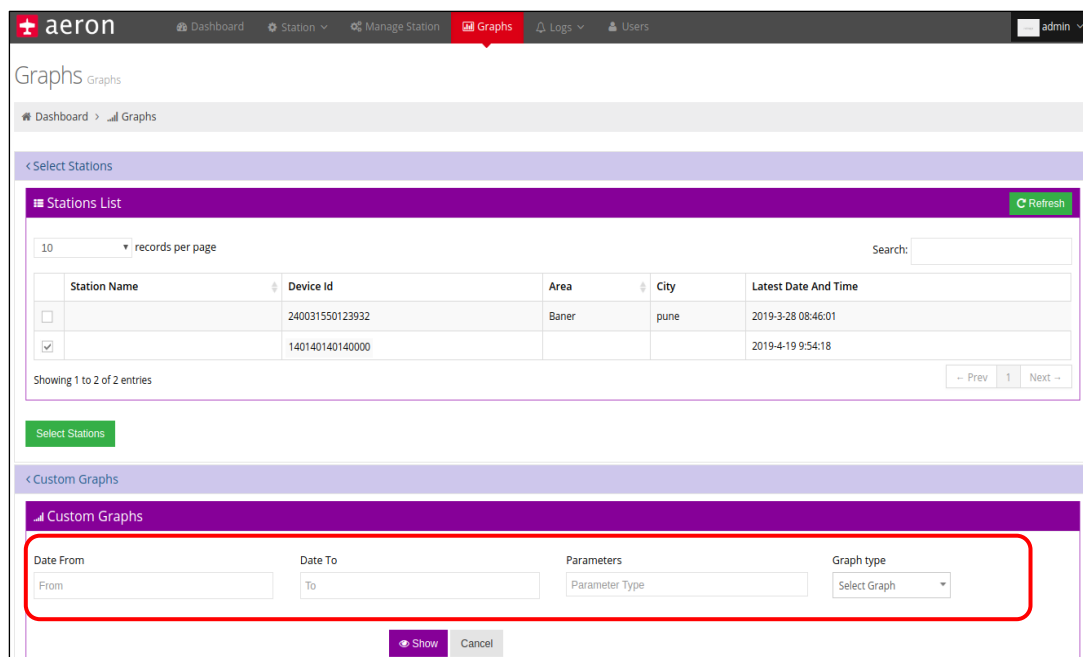
Format of the data CSV file:

Sr. No.,
Date,

Time, Parameter1, Parameter2, ..., GPS Fix,

Network
Registration, Network

11.3.3. Graphs



The screenshot shows the Aeron web application interface. The top navigation bar includes 'Dashboard', 'Station', 'Manage Station', 'Graphs' (highlighted), 'Logs', and 'Users'. The 'Graphs' section is active, displaying a 'Stations List' table with columns: Station Name, Device Id, Area, City, and Latest Date And Time. Two stations are listed, with the second one selected. Below the table is a 'Select Stations' button. The 'Custom Graphs' section is also visible, featuring input fields for 'Date From', 'Date To', 'Parameters', and a 'Graph type' dropdown menu. A red box highlights these input fields. At the bottom of this section are 'Show' and 'Cancel' buttons.

FIGURE 34: GRAPH

1. Click on **Graphs** in menu bar.
2. Select **All Graphs**
3. Select **USN**
4. Select **Date From** and **Date To**, **Parameter name** (configured in device) and **Graph type**.
5. Click on **Show** button.

The data representation can be done in the graphical format as shown below.

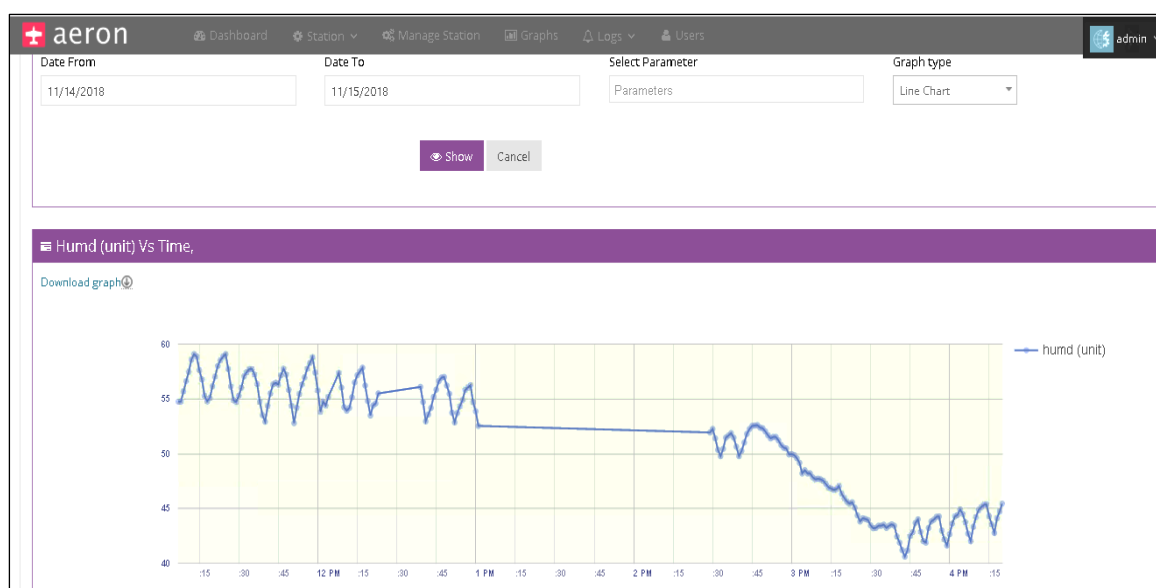


FIGURE 35: GRAPH VIEW

11.3.4. Reports

The reports of the logged data can be obtained as:

1. Daily
2. Weekly
3. Monthly

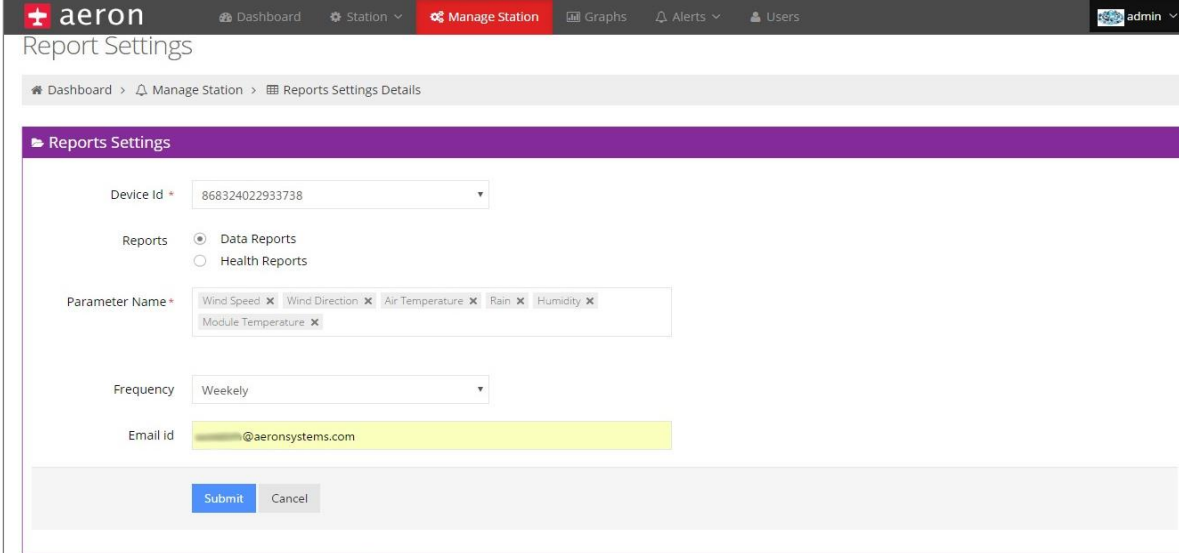
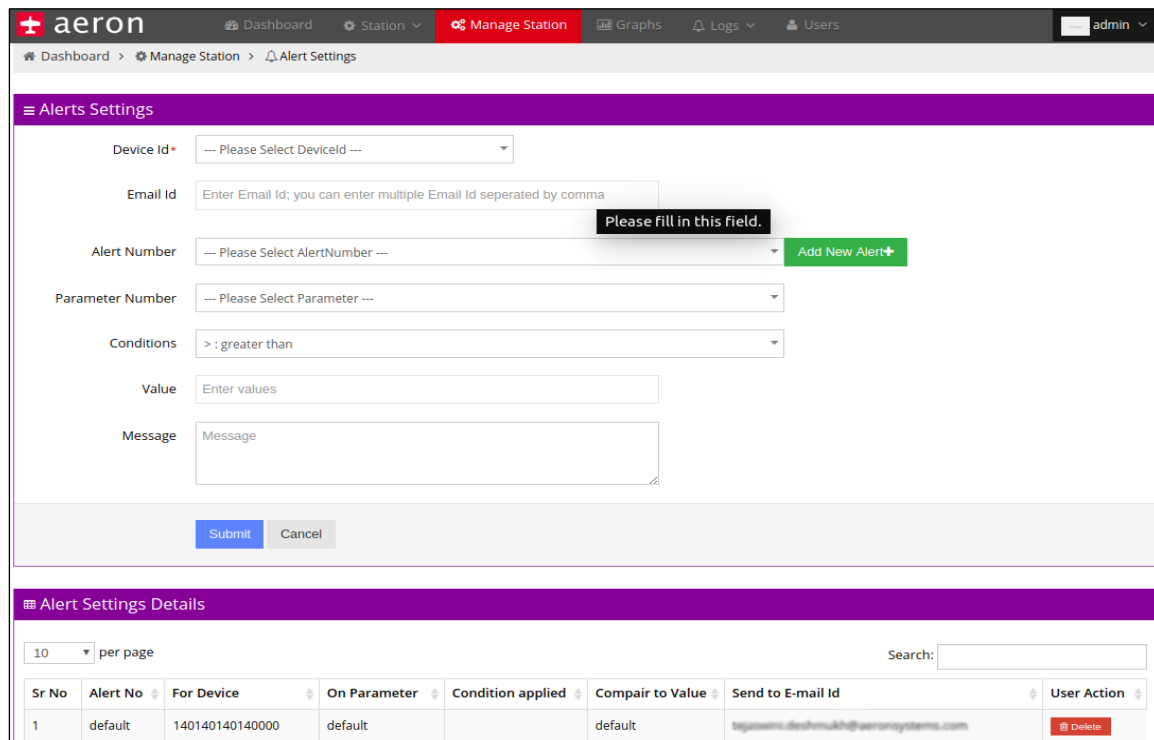


FIGURE 36: REPORT SETTING

11.3.5. Alerts

User defined '**Alerts**' can be created for individual parameters.

The alerts can be sent over mail.



Alerts Settings

Device Id*

Email Id

Alert Number Add New Alert+

Parameter Number

Conditions

Value

Message

Alert Settings Details

10 per page Search:

Sr No	Alert No	For Device	On Parameter	Condition applied	Compare to Value	Send to E-mail Id	User Action
1	default	140140140140000	default		default	tejaswini.deshmukhi@aeronsystems.com	<input type="button" value="Delete"/>

FIGURE 37: ALERT SETTING

12. DEVICE PROTOCOLS

12.1. Serial Protocol

The configuration needs to be done for sending and receiving data over RS232 / RS485. The details about the common fields are as given in the table below.

TABLE 2: SERIAL PROTOCOL PARAMETER DETAILS

Serial Configuration Field	Brief of Configuration Parameter
MODBUS Master	
Slave Id	Slave Id is a unique unit address from 1 to 247. When the master requests data, the first byte it sends is the Slave address. This way each slave knows after the first byte whether to ignore the message.
Function Code (03 /04)	This number in MODBUS master query requests the slave which table to access to read register value from the table.
Response Time	Query response wait time.
Polling Interval	Delay between consecutive queries.
Base Address	This number in MODBUS master query request the slave the address from where the data is to be retrieved.
Number of Registers	Registers can be combined to form various data types. Each register stores two bytes; hence we can combine 2 registers for int and float data types. Similarly, 4 registers for long and double data types.
Data / Display type	Data type i.e. Signed, unsigned, binary, float, float inverse, long, long inverse, double & double inverse.
MODBUS Slave	
Starting Address	Each slave requires a unique address from where the data is stored. This number is a fixed to 0 for AQM21 device when selected as MODBUS slave.
Function Code	For device acting as slave the function code is set to 04 (04 hex) as Read Input Registers.
Data / Display Type	Data type is set as float for AQM21 when selected as MODBUS slave.

RS232 Serial Input (COM2)

- RS232 serial input is provided to facilitate easy communication to sensors with serial output. RS232 serial input is 3 pin connector TxD, RxD, and Ground.
- When device is a MODBUS Master, it communicates with MODBUS slaves to collect and store data.
- Device can be configured to decode ASCII Input strings of specific sensors.

RS232 Serial Output (COM1)

- RS232 serial output is provided to communicate data to other devices connected with it. RS232 serial output has 3 pin connector TxD, RxD, and Ground.
- The serial port can act either as MODBUS Slave or can send NMEA ASCII output string.
- When device is a MODBUS Slave, it communicates with MODBUS masters and provides requested data.
- When device is configured with NMEA ASCII string as output, it will send the selected parameters over this port in the format described in above sections.

RS485 Serial Input (COM3)

Device is configured as MODBUS Master and will communicate with PLCs/Inverters/Energy meter and log the data.

RS485 Serial Output (COM4)

Device is configured as MODBUS Slave; it communicates with MODBUS masters and provides requested data.

12.2. Server Protocol

Device can upload the data to the cloud over the following protocols.

- **FTP:** The File Transfer Protocol (FTP) is a standard network protocol used for the transfer of computer files between a client and server on a computer network.
- **HTTP:** HTTP means Hypertext Transfer Protocol. HTTP is the underlying protocol used by the World Wide Web and this protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.
- **HTTPS:** Hyper Text Transfer Protocol Secure (HTTPS) is the secure version of HTTP. It creates a secure channel over an insecure network. The communication protocol is encrypted using Transport Layer Security (TLS). HTTPS also aids in securing from any uncertain occurrences and tempering and is considered secure against them. It gives a safe communication over a computer network.

13. USB PORT CONNECTIVITY

The USB port is available for instant data download. AQM21 supports USB 2.0. To download the data in the pen drive, follow the steps below:

1. Open the top lid of the AQM21 assembly to access the bottom section.
2. Insert the pen drive in the USB slot provided (refer below figure), the data transfer will begin immediately. The process takes upto 10 minutes for complete transfer.
3. Remove the pen drive after 10 mins.



FIGURE 38: CONNECTING PEN DRIVE TO USB PORT

Note:

1. Do not eject the pen drive before the specified time period.
2. Latest files are copied first.

14. DEVICE INFORMATION OVER SMS

The following table contains the SMS format to be sent to AQM21 (device phone number), to get the basic device information.

Note: The default SMS PIN for the device is '2123'.

TABLE 3: DEVICE INFORMATION OVER SMS

Parameter	SMS Format	SMS Reply Format	Description
Date	<SMS PIN> get date E.g. 2123 get date	Device Date: <dd/mm/yyyy> E.g. Device Date: 4/12/2019	Get date of device
	<SMS PIN> set date <dd/mm/yyyy> E.g. 2123 set date 5/12/2018	Device Date: <dd/mm/yyyy> E.g. Device Date: 5/12/2018	Set the date of the device [If user enters wrong date, it will be corrected if device has GPS, NTP or cellular time Sync ON]
Time	<SMS PIN> get time E.g. 2123 get time	Device Time: <hh:mm:ss> E.g. Device Time: 14:0:58	Get time of device
	<SMS PIN> set time <hh:mm:ss> E.g. 2123 set time 16:17:52	Device Time: <hh:mm:ss> E.g. Device Time: 16:17:52	Set the time of device [If user enters wrong time, it will be corrected if device has GPS, NTP or cellular time Sync ON]
Time Zone	<SMS PIN> get timezone E.g. 2123 get timezone	Device Timezone: <value> E.g. Device TimeZone: Asia/Kolkata	Get time zone of the device
IP	<SMS PIN> get ip E.g. 2123 get ip	Device IP: <value> E.g. Device IP: 192.168.5.60	Get Ethernet IP address of the device
Gateway	<SMS PIN> get gateway E.g. 2123 get gateway	Device Gateway: <value> E.g. Device Gateway: 192.168.10.46	Get Ethernet Gateway Address of the device

Parameter	SMS Format	SMS Reply Format	Description
Netmask	<SMS PIN> get netmask E.g. 2123 get netmask	Device Subnet: <value> E.g. Device Subnet: 255.255.254.0	Get Ethernet Netmask Address of the device
Auto manual	<SMS PIN> get automanual E.g. 2123 get automanual	Device IP Type: <value> E.g. Device IP Type: manual	Get IP type (Static / DHCP) of the device
Device Info	<SMS PIN> get devinfo E.g. 2123 get devinfo	USN;Part ID; <value>,<value>; E.g. USN; Part ID; 563289745126595; XTMA8/H6.4/G/E18/A/5;	Get USN and Part ID of the device
Number of parameters	<SMS PIN> get numofpara E.g. 2123 get numofpara	NumOfParameters: <value> E.g. NumOfParameters: 128	Get number of parameters set on device
Set Log At (Logging Interval)	<SMS PIN> set logat <value> E.g. 2123 set logat 5	Logat: <value> E.g. Logat: 5 mins	Set a logging interval of the device, valid values are as per local webpage. Select the log interval from 1,2,5,10,30,60 mins.
Reboot	<SMS PIN> set reboot E.g. 2123 set reboot	This command will reboot the device
Client Cloud Address	<SMS PIN> get clientcloudaddr E.g. 2123 get clientcloudaddr	ClientCloudAddr: <value>	Get IP address and Port number of active servers
FTP Address	<SMS PIN> get ftpaddr E.g. 2123 get ftpaddr	FTPServerAddr: <value>	Get IP address and Port number of active servers

Note:

If any of the settings is inactive or disabled for a parameter, reply over the SMS will be blank for that query. 'SMS' can be sent in upper case or lowercase. The SMS must be sent to the device phone number.

15. DEVICE CARE

Following are some tips for device care:

1. Power must be turned OFF before making any changes in the device wiring.
2. The system must be supplied with a regulated DC power.
3. Make sure that the Chassis ground is properly terminated to the earthing.
4. Do not rest the AQM21 assembly on bottom mesh, this may damage the mesh and the cables connected to sensor assembly. It is advisable to rest the assembly on the mounting bracket situated at back as shown below.

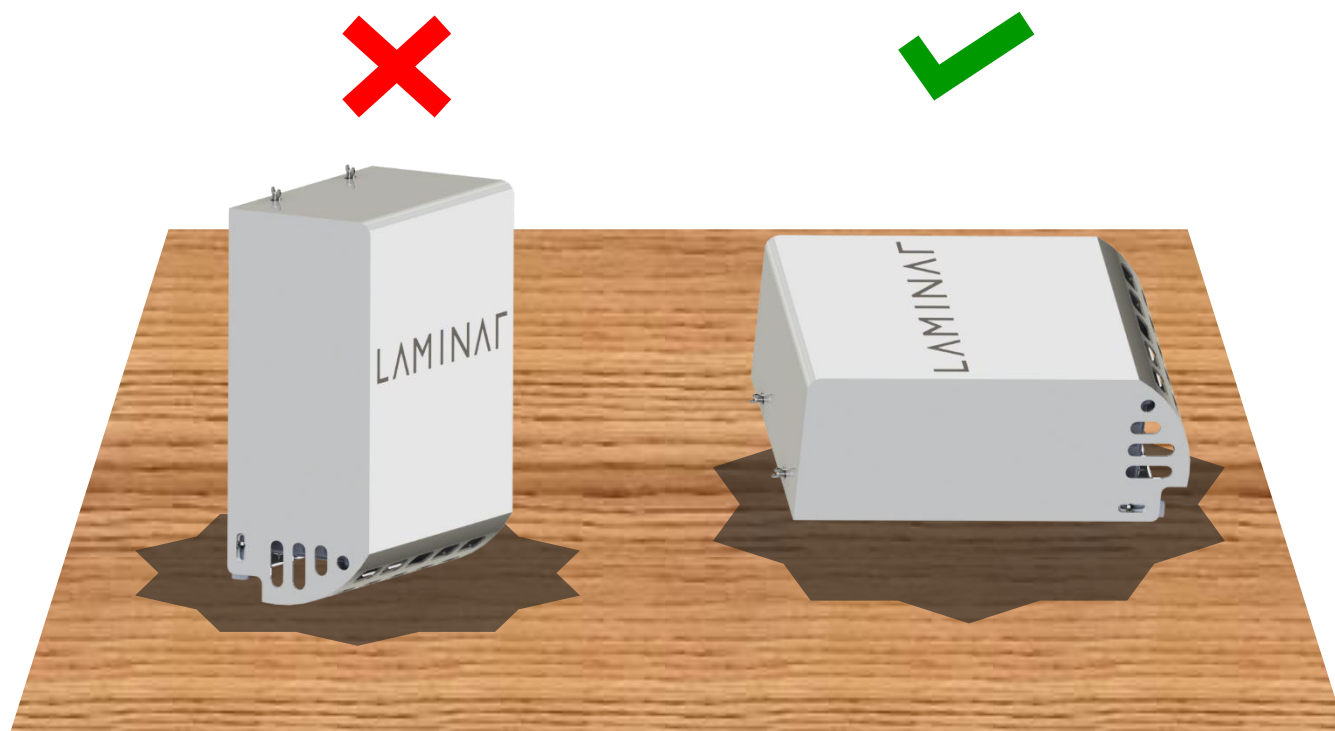


FIGURE 39: RESTING THE AQM21 ASSEMBLY

16. FAQs

1. What are the specifications for power supply?

Ans: The power supply must be in the range, +9 to +28 V DC only.

2. How do I access the webpage?

Ans: First connect power supply and Ethernet cable to the system. Check Power LED and Ethernet LED. If both are glowing, then open the webpage with provided link and then configure the system. In case if Ethernet is not working, an IP scanner software can be used to get the device IP. This IP can be then used to open the webpage and configuration can be done. User can also access the webpage by using Wi-Fi.

3. How to retrieve data in a pen drive?

Ans: Connect pen drive to USB port, the orange LED will blink, indicating the data retrieval to the pen drive. Do not remove the pen drive while the data is being transferred.

4. How often do I need to download information from the AQM21?

Ans: Data storage limit for AQM21 is about 3 years. Hence, user may decide the frequency at which to download data to avoid data loss.

5. Whom should I contact if my Device is not working correctly?

Ans: Technical support is provided by Aeron Systems. Write to us at support@aeronsystems.com

6. Is my data safe over Ethernet / Wi-Fi / LTE transmission or any unauthorized person can access my data?

Ans: As data is in encrypted format, data is safe and secure when transmitted over the network. Device has been provided with unique ID which gets linked with the individual device and the data is accessible through the website with valid login credentials only.

7. What if webpage is accessible by its IP and not by hostname in Windows?

Ans: It might be a DNS issue. In this case try to enable IPV4 and disable IPV6 in your computer LAN settings. Now device should be accessible by hostname.

8. What if the device webpage shows red cross on SD card symbol?

Ans: Cross symbol indicates that the SD card of device is not getting detected.

1. Try to reboot device via webpage.
2. If the issue persists, reinsert the SD card. If the card is intact and the problem persists, there is a possibility that the card is corrupted. In such a case, remove the SD card, format the card with EXT4 format and insert it again. Restart the device and check if the card is detected.
3. If the problem persists even now, then turn the device OFF and replace the SD card. Format the new SD card with EXT4 format and insert in device and power ON the device again.

Note: *If the system is inaccessible, or the SD card shows cross mark, device will log data in secondary memory and data will be synced with the server (when Ethernet / Wi-Fi / LTE is available).*

9. Which web browser should be used for opening the device local webpage?

Ans: The local webpage should open in any web browser. It is recommended to use Google Chrome or Mozilla Firefox for the best results.

10. What to do if the SIM card is not detected?

Ans: Check if the antenna connection is in proper position. Check if the SIM card used is registered and activated. Remove the SIM card and re-insert in proper orientation. Restart the device.

11. What to do if GPS location is not detected on device webpage?

Ans: Make sure the GPS antenna is properly positioned and secured in connector. Set the GPS update interval to 1 hour.



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