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Data Sheet: PAQS Products

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1. Environmental Sensor Model No ES 001.1 W/G

Ser no	Parameter	Specification	Sensing Range/Remarks
1	Measurement elements	Temperature, Humidity, Light, Noise, CO, NO2 ,O3, SO2, pm2.5, pm10,CO2,UVa,Uvb	
2	Measurement components & Measurement range	NO2 CO SO2 O3 PM2.5 PM10 Temperature Relative Humidity Light Noise CO2 Uva Uvb Pressure	0 to 10 ppm 0 to 1000 ppm 0 to 20 ppm 0 to 1000 ppb o to 250 micro gms/cu m 0 to 450 micro gms/cu m -10 to 100 Deg. C up to100% up to10,000 Lux 30 to 120 db(A) up to 5000ppm up to 15mW / cm2 up to 15mW / cm2 540-1100 Hpa/mb
3	Connectivity	GSM(3G/4G) Wi-Fi/ Ethernet (RJ45) Wireless backhaul to Cloud. Third party access for • Raw data at defined frequencies • Curated /Computed data	Easily interchangeable between Wi-Fi & GSM
4	Software and Data backup	Data Buffer Capacity up to 3 years	
5	Data Capture Frequency	Every 30 seconds	
6	Battery	Li-Ion Battery Backup of 4 hours	
7	Enclosure	Compact Aero Dynamic Design (Like a disc) and modular for minimal air resistance which houses the all the sub sensors	
8	Rating	IP 65 with the enclosure housed in the shell	Ruggedized enough to be deployed in open air areas on streets and parks.
9	Stabilization Time	Stabilization Time on power outages < 10 minutes	
10	Visual Indication	LEDs on the enclosure for easy visual indications	

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11	Products origin and certification	• Product is **Made in India** • Communications modules are FCC, PTCRB compliant • All major components of Environmental sensors like individual sensors etc are CE certified	
12	Housing Design	Universal Housing which can be mounted on buses/Public Transport and designed to ensure minimum air resistance	

13	Software Solution	a. Solution to enable APIs for mobile & Web services
		b. APIs to provide
		    a. Status of Devices
		    b. AQI Colour Schema
		c. Lead pollutant contributing to AQI
		d. Architecture to support computation of new parameters such as
		    a. Now Cast AQI
		    b. Zonal Limits	

14	Support system	a. Alerts for outages b. Alerts for Device working on Battery/Mains c. Alerts for any pollutant crossing the breakpoint level for PM 2.5,PM 10,SO2,NO2 O3 and CO d. Alerts for Noise level reaching breakpoint level for Hospitals e. Alerts for AQI crossing the Satisfactory Pollution level f. Remote configuration of Sensors	
15	Element Management System	a. Device Listing & Details b. Device Availability c. Device Polling status d. Device Outage status e. API Usage Report f. Control on Email alerts for device downtime g. Weekly & Monthly trends	

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		h. Historical data	
16	Data Analytics	a. lead pollutants, trends & Source level apportionments b. Integration and analysis of various northbound API's including traffic / parking & Environment to derive insights.	
17	Span Drift	All Parameters	±2.0% FS max./week
18	Zero Drift	All Parameters	±1.0% FS max./week (±2.0% FS/week max. if range is less than 200ppm)
19	Operating Range		-10°C to 60°C
20	Data Collection		Data from Sensors sent to PAQS cloud located in India and available as secure REST APIs for IOT platforms/other applications
21	Operating Pressure		±10%

Table No 1

2. Sensors Specifications

Ser No	Sensors	Sensing Range	Resolution	Lower Detectable Limit	Precision (Reading)	Linearity (Full Scale)	Accuracy	Flow Rate	Update Interval (Secs)	Drift (Per Year)
1	CO	0 to 1000 PPM	0.001 PPM	0.040 PPM	3%	1%	±1% FS	-	30	-
2	O3	0 to 1000 PPB	10 PPB	0.001 PPB	3%	1%	±1% FS	-	30	-
3	NO2	0 to 10 PPM	0.001 PPM	0.001 PPM	3%	1%	±1% FS	-	30	-
4	SO2	0 to 20 PPM	0.001 PPM	0.009 PPM	3%	1%	±1% FS	-	30	-
5	CO2	0 to 5000 PPM	1 PPM	10 PPM	3%	2%	±1% FS	-	30	-
6	PM (2.5 & 10)	0 to 250 micro gms/cu m and 0 to 450 micro gms/cu m	-		-	less than 1µg/m3	<±(5µg/ m3 + 15 % of reading)	1.0 LPM	30	-

7	Temperature	-10 to 100 Deg. C	0.04	-10°c to 80°c	±0.1	-	±0.3^{o}c	-	10 to 12	<0.02 /yr
8	Relative Humidity	up to100%	1%	0 %RH	3%	-	±2%+	-	< 15	<0.25 %
9	Noise	30 to 120 db(A)	0.1 dBA	30 dBa	flat from 20 Hz-20kHz	-	+/- 2.5 dBa	-	30	-

Table No 2

3. Barometric Pressure Sensor Model No BPS 001

Ser no	Parameter	Specification	Sensing Range/Remarks
1	Measurement elements	Barometric Pressure	Hg, mmHg and hpa/mb
2	Measurement component & Measurement range	a) Elevation range of the barometric pressure sensor -600m to 4570m. b) Range of barometric pressure sensor 540 hPa/mb to 1100 hPa/mb	
3	Accuracy	a) Uncorrected reading accuracy b) Equation Accuracy c) Elevation Accuracy d) Overall Accuracy	±1.0 hPa /mb ±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb) ±10' (3m) ±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb)

Table No 3

4. Flood Sensor Model No FS 001

Ser no	Parameter	Specification	Sensing Range/Remarks
1	Measurement elements	Flood Water Level	
2	Measurement component & Measurement range	Ultrasonic Sensor	Up to 15 Meters
3	Resolution		.02 meters
4	Accuracy		±5% over Full Scale

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3	Connectivity	GSM 3G/4G Wireless backhaul to Cloud. Third party access for Curated /Computed data	
4	Software and Data backup	Data Buffer Capacity up to 3 years	
5	Data Capture Frequency	Every 30 seconds	
6	Battery	Li-Ion Battery Backup of 8 hours/Solar Power	
7	Enclosure	Cuboidal,	
8	Stabilization Time	Stabilization Time on power outages < 5 minutes	
9	Visual Indication	LEDs on the Device for easy visual indications	
10	Products origin and certification	• Product is **Made in India** • Communications modules are FCC, PTCRB compliant • All major components of sensors are CE certified	
10	Operating Range		-10°C to 60°C
11	Software Solution	a. Solution to enable APIs for mobile & Web services b. APIs to provide • Status of Devices • Flood Level	
12	Support System	a. Alerts for outages b. Alerts for Device working on Battery/Mains c. Alerts for Water Level crossing the breakpoint level d. Remote configuration of Sensor	

13	Element Management System	i. Device Listing & Details j. Device Availability k. Device Polling status l. Device Outage status m. API Usage Report n. Control on Email alerts for device downtime o. Weekly & Monthly trends p. Historical data	
14	Data Analytics	Analysis of rain fall data with the flood data	
15	Data Collection		Data from Sensors sent to PAQS cloud located in India and available as secure REST APIs for IOT platforms/other applications

Table No 4

5. **Rain Water Sensor Model No RWS 001**

Ser no	Parameter	Specification	Sensing Range/Remarks
1	Measurement elements	Rain Water	Inches and Millimeter
2	Measurement component & Measurement range	Rain gauge sensor and a data logger	a)Daily Rainfall range shall be 0 to 99.99" (0 to 999.8 mm). b)Monthly/yearly/total rainfall range shall be 0 to 199" (0 to 6553 mm).
3	Accuracy		4"/hr (100 mm/hr) or ±4% over Full Scale
4	Resolution		.25 mm
5	Connectivity	GSM(3G) Wireless backhaul to Cloud. Third party access for Curated /Computed data	
6	Event specification	0.02" or (0.5mm) of rainfall shall be considered as a storm event with 24 hours without further accumulation shall end the storm event.	
7	Software and Data backup	Data Buffer Capacity up to 1 years	

8	Data Capture Frequency	Every 30 seconds	
9	Battery	Li-Ion Battery Backup of 8 hours/Solar Power	
10	Enclosure	Cylindrical Design to measure Rain Water	
11	Stabilization Time	Stabilization Time on power outages < 10 minutes	
12	Products origin	• Product is **Made in India** • Communications modules are FCC, PTCRB compliant	
13	Housing Design	Universal Housing which can be mounted on Roof top/ground	Ruggedized enough to be deployed in open air areas on streets and parks.
14	Software Solution	a. Solution to enable APIs for mobile & Web services b. APIs to provide • Status of Devices • Rain Measured	
15	Support system	a. Alerts for outages b. Alerts for Device working on Battery/Mains c. Remote configuration of Sensors	
16	Element Management System	a. Device Listing & Details b. Device Availability c. Device Polling status d. Device Outage status e. API Usage Report f. Control on Email alerts for device downtime g. Weekly & Monthly trends h. Historical data	
17	Data Analytics	Cross correlation analytics with the air pollution and flood parameter	
18	Operating Range		-10°C to 60°C
19	Data Collection		Data from Sensors sent to PAQS cloud located in India and available as secure REST APIs for IOT platforms applications

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Table No 5

6. Wind Speed & Wind Direction Sensor (Model No WSD 001)

Ser no	Parameter	Specification	Sensing Range/Remarks
1	Measurement elements	Wind Speed & Direction	km/h or knots
2	Measurement component & Measurement range	a) Wind Speed Range	0-60m/s
3	Resolution		
		a) Display resolution	resolution shall be 16 points (22.5°) on compass rose, 1° in numeric display
4	Accuracy		
		a) Wind Direction b) Wind Speed	±3% over Full Scale ±5% over Full Scale
3	Connectivity	GSM 3G/4G Wireless backhaul to Cloud.	
4	Software and Data backup	Data Buffer Capacity up to 3 years	
5	Data Capture Frequency Wind speed sensor Wind Direction sensor	Every 30 seconds 2.5 to 3 seconds	
6	Battery	Li-Ion Battery Backup of 8 hours/Solar Power	
7	Enclosure	Wind cups	
8	Stabilization Time	Stabilization Time on power outages < 5 minutes	
9	Visual Indication	LEDs on the Device for easy visual indications	
10	Products origin	Product is **Made in India**	
10	Operating Range		-10°C to 70°C
11	Software Solution	a. Solution to enable APIs for mobile & Web services b. APIs to provide • Status of Devices • Wind Speed &	

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		Direction	
12	Support System	a. Alerts for outages b. Alerts for Device working on Battery/Mains c. Alerts for Wind speed crossing the breakpoint level	
13	Element Management System	a. Device Listing & Details b. Device Availability c. Device Polling status d. Device Outage status e. API Usage Report f. Control on Email alerts for device downtime g. Weekly & Monthly trends h. Historical data	
14	Data Analytics	Analysis of Rain fall data, Humidity & Temperature with the Wind Speed	
15	Data Collection		Data from Sensor sent to PAQS cloud located in India and available as secure REST APIs for IOT platforms/other applications

Table No 6

Figure 1: Environmental sensor

Figure 2: Outer shell (housing1)

Figure 3 : Installed Environmental Sensor (Housing 1)

Figure 4 : Installed Environmental Sensor (Housing 2)

Figure 5: Flood Sensor

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Figure 6 : Installed Flood Sensor

Figure 7 : Installed Rain Water Sensor

Figure 8 : Wind Speed & Wind Direction Sensor