CASCADEMIC solutions
InnovaTion towards Embedded Planet

Environment Monitoring System

Highlights

Integrated Unit with Multiple Sensors

Low Power, High Accuracy

Online Measurement

Cloud Connectivity

Alarm Threshold

Multiple Sensors in Single Unit

CASCADEMIC's environment monitoring system is designed to provide a scalable, efficient and compact solution that integrates multiple sensors in a single, easy to deploy unit. This compact, easy to install Environment Monitoring System collects and analyzes air quality parameters like CO2, SO2, NO2, PM, H2S, methane(CH4) and water quality parameters like pH, BOD/COD, TSS.

High Precision Pre Calibrated Sensor

The Environment Monitoring Solution is based on nondispersive infrared (NDIR) sensor technology and compact optics to achieve excellent performance characteristics, including high accuracy and low power consumption.

All sensors are factory-calibrated. All selectable applications are precalibrated and allow quick and easy commissioning. This allows the customer to simply plug and play the sensors to get precise data.

Round-the-clock Cloud Connectivity

The Environmental Monitoring Software provides flexibility and adaptability in data collection from the sensors, communication and storage to the various cloud platform through GSM/GPRS/WiFi connectivity features.

Remote device management and data access are also made simple with web interfaces and mobile apps. Information such as hourly and daily averages is automatically computed. Data can also be exported to external programs to perform more sophisticated statistical analysis.

The Monitoring solution has a built in Node-RED application running which allows an easy way to connect to cloud services such as IBM Watson IoT™, and Microsoft® Azure®. These nodes make IoT application development simpler, easier to repeat, and faster to scale up.

Real Time Analysis and Feedback

CASCADEMIC's Environment monitoring system continuously collects and analyzes output from the sensors, displays and sends the same on-site as well as to cloud. Flexible software gives provision for customers to monitor and set threshold according to their needs from the cloud. This permits the user to both analyze and control at the remote end through internet connection.

Hardware	
Processor	• NXP i.MX SOM • ARM Cortex A7 Core based CPU • 528 MHz / 1.2GHz*
Memory	• DRAM , NOR and NAND Flash Memory Standards • 256 MB RAM*
Storage	• SD Card (Expandable up to 32GB) • eMMC Support
Power Supply	• 9 – 32V DC • 7.4V, 1100mAh Rechargeable Battery Back Up
Sensors	
PH	• 0 – 14
CO2	• 400 – 5000 ppm
PM	• 0 to 28,000 pcs/liter (0 to 8,000pcs/0.01 CF=283ml)
TSS	• 0 to 4000 NTU
COD	• 0 to 1000 mg/L
NO2	• 0 to 20 ppm
SO2	• 0 to 20 ppm
Software	
Operating System	• UBUNTU 14.04 • YOCTO LINUX
Wireless Protocol Support	• MQTT • CoAP • Firmware over the Air (FOTA)
Protocol Support	• MODBUS • PROFIBUS
Security	• Secure boot • 128 bit AES • SSL / TLS Layer • Firewall (IP tables) & IP routing

* Custom configuration

Connectivity - wired	
Serial	• RS232 • RS485
Ethernet	• 10/100 LAN • RJ45 Port
USB	• USB 2.0 OTG* • Debug Serial micro USB
Peripherals*	• RGB LCD Support • Alphanumeric LCD
Connectivity - wireless	
Wi-Fi	• 802.11b/g/n • Client and Access Point Mode
Bluetooth Classic / Bluetooth Low Energy	• BT Version 4.2 • BLE Support • GAP, SDP, SPP, and GATT profile support
WWAN – 3G / 4G / LTE	• Quad Band GSM (850 / 900 /1800/1900 MHz) • HSPA+ Data Rate – 42/5.7(DL/UL)[Mbps] • LTE – Data Rate – 100/50(DL/UL)[Mbps]
User Interface	
LED	• Power Status LED • Public Network Connection Status • Wired Interface Connectivity Status • System Error
Power Switch	• On / Off Power Switch
Reset	• System Reset Switch
Environmental Parameters	
Operating Temperature	• 0deg.C to +50deg.C
Storage Temperature	• -40deg.C to +85deg.C
Relative Humidity	• 5% to 95% Non Condensing

CASCADEMIC's Environment Monitoring Solution contributes towards saving the planet through its numerous applications. It is typically used in Waste treatment plants – be it Industrial Waste treatment, municipal waste treatment or others. It helps to optimize and control the performance of the plant. It also enables monitoring river water, surface water for water quality, thus contributing towards a cleaner planet.

The Solution employs NDIR sensor technology and it is possible to determine the values of important parameters for waste water treatment like pH, BOD/COD, TSS quickly and precisely without the use of hazardous chemicals.

One more important usecase for the Environment Monitoring Solution is Air Quality monitoring. The Central Pollution Control Board (CPCB) prescribes norms and standards for Air Quality to be met and aims to control and regulate pollution from industries and other sources. As a result, there is a need to continually monitor and meet the standards set for ambient air quality and to ascertain that the prescribed ambient air quality standards are not violated.

CASCADEMIC's Environment Monitoring Solution effectively addresses this need by recording and analyzing air quality parameters like CO2, SO2, NO2, PM, H2S and sending the collected data over the cloud for monitoring.

CASCADEMIC solutions

Industrial IoT Gateway

Energy Monitoring Solution

LoRa™

LoRa Connectivity Solution

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Cloud Connectivity Solution

Azure
IBM Bluemix
amazon web services™

Environment Monitoring

Thermal Printer

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