



# WIRELESS SENSOR NETWORK FOR ENVIRONMENTAL MONITORING

Custom designed, general purpose and easy to interface wireless sensor node for environmental monitoring parameters.

## THE INVENTION

We present the KFUPM node, a general purpose, easy to integrate, easy to program and fully interoperable wireless sensor node for all your event monitoring applications.

Following is the summary of operating principle:

- Every node is programmed with a unique ID.
- One deployed, the sensor node discovers its neighbours and develops a network map.
- Based on the proximity of other nodes, clusters are populated.
- Every sensing node in the cluster sends its data to the respective cluster head, which relays it until it reaches the sink node.
- At the sink node, the received data is stored and can be evaluated as desired by the administrator.

## MARKET NEED

Parameter monitoring is a vital task performed in all the major industrial setups. Depending on the application, constant monitoring of factors like temperature, pressure and humidity is necessary to ensure quality of the products.

With a properly established wireless sensor network (WSN), administrator can monitor and control the system remotely.

A simple “program, deploy and monitor” strategy!

## COMPETITIVE ADVANTAGE

The KFUPM node gives you the ability to interface multiple analog and digital sensors by providing two extension ports. No need to purchase special costly sensor boards or proprietary sensors. As long as a sensor operates at less than 5 VDC, you are in business!

## MARKET READINESS

KFUPM node is no longer an idea, a double-sided PCB based working prototype has been designed and fabricated. A working WSN of 40 devices was used to measure and report the temperature, light and humidity levels inside the room.

Presently, a KFUPM node based WSN is being utilized to help develop a mechanism to prevent flashover on HV transmission lines.

The present PCB can be further miniaturized using multilevel fabrication process. Furthermore, commercial fabrication methods can be used to make KFUPM node rigid and suited for outdoor environment.

We are looking for a partner who would help us develop and market the next version of the KFUPM node.

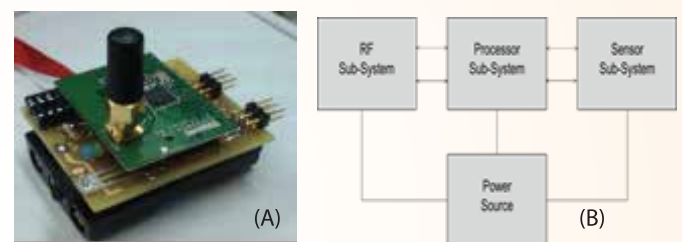


Fig. 1. KFUPM Ver. 2 sensor node (a) snapshot and (b) block diagram



Fig. 2. KFUPM Sensor node based WSN for monitoring natural pollution deposition levels on HV insulators in outdoor insulator yard.

## RECOMMENDED IMPROVEMENTS

Despite of its working nature, the KFUPM sensor node does need the following improvements for a field deployment:

- A multi-layer PCB design for even smaller size.
- A PCB with adequate protection for operation in hot and humid environments.

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