

# Wireless Sensor Based Portable Patients Physiological Parameters Monitoring System

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**ABSTRACT:**In the past there are nurses available for continuous monitoring of patient's health in the hospital. Hence medical staff ratio is increased behind every patient who suffering from critical condition. Now a day's remote control wireless portable systems available to monitor patient's health. These system help to monitor patients physiological parameters such as body temperature, body position, saline level indication and gas level measurement. These all parameters measured by ARM Processor and send these measured data to LCD or remote PC. If there is need of emergency treatment of patient then alert message send to doctor's mobile.

**KEYWORDS:** Body Temperature, Body Position, saline level indication, gas level measurement.

## I. INTRODUCTION

Patients monitoring system through wireless network is helpful to people who are living in old age home those who have no one care taker. System can monitor patients health through home hence large space of hospitals not needed. Old people have to need continuous monitoring of physiological parameters of patients. Due to continuous monitoring of patients health they get fast treatment and help them to recover from any disease speedily.

Proposed system monitor patient's body temperature, Body position, saline level indication and gas level measurement with the help of various sensors. These sensor value read by Arm cortex processor. Values read by processor is display on LCD and Remote PC.If patients suffering from any problem then to give emergency treatment as early as possible.

## II. BACKGROUND

There are various models earlier invented for patient's monitoring on the basis of various communication network they are as follows [1]Mona kamel introduced secure remote patient monitoring system. This paper helps to monitor patients in chronic diseases. Low cost secure portable system with wireless transmission is presented to monitor vital parameters such as heart rate, o2 level etc. transmitted data is archived and visualized both on mobile phone and centre server. Here Bluetooth communication protocol is used for transmission of data to mobile which has short range and WIFI for centre sever. This type of device has limited range of communication and monitor only two parameters.

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[2] Malika introduced paper on “An indoor wireless zigbee based patient monitoring system for hospitals” it monitors patients health wirelessly using zigbee network. Microcontroller used to read sensor values which has large size as hardware components more.

Proposed system is portable having wireless network help to transfer patient data securely to doctors PC and on LCD. GSM network help to give alert message to doctors mobile. If saline bottle finish then buzzer is ON so hospital staff got indication. If any poisonous gas or quality of air in patients room is low then gas sensor detect it. Device also records patients temperature and body position. Display all sensor data on LCD and remote PC. If sensor value increased above abnormality level then alert message send to doctors mobile.

### III PROPOSED WORK

Proposed System consists of different sensor connected to processor which read sensor value display values on Remote Pc / LCD through wireless network. If patient needs emergency treatment then alert message send to doctors mobile via GSM.

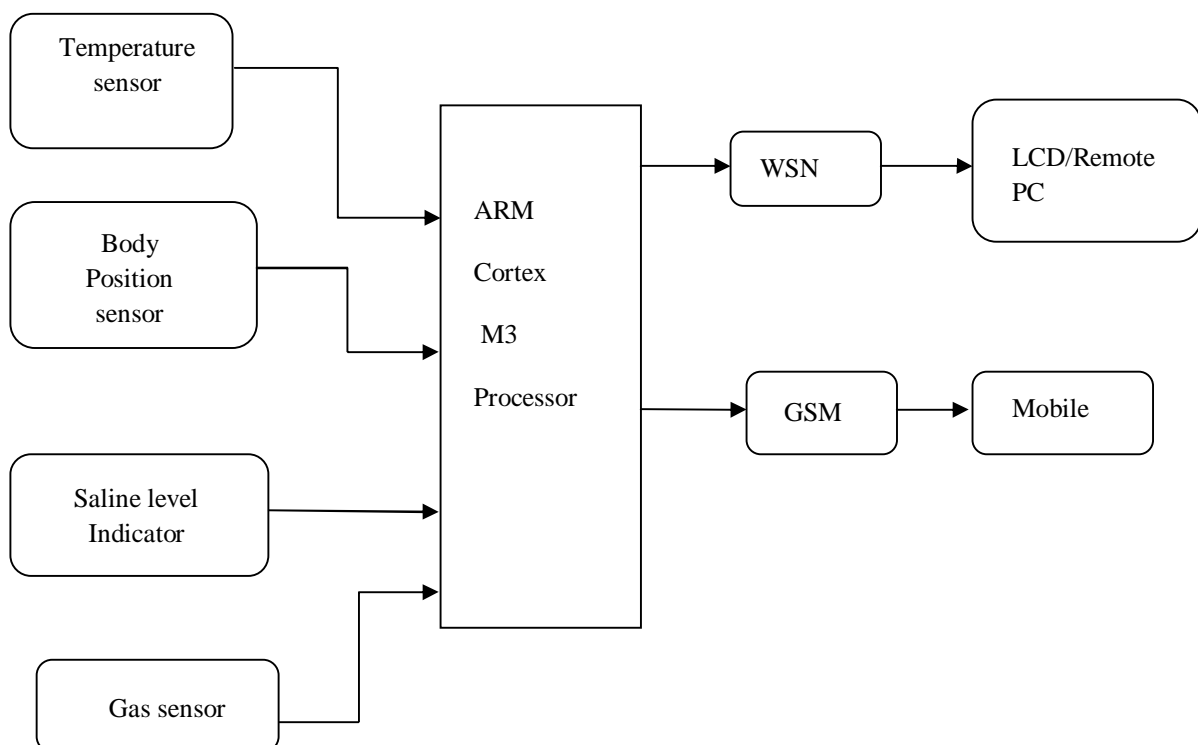


Figure 1: Block Schematic of Proposed System

Each and every block of proposed system is explained as follows:

- Temperature Sensor: LM35 sensor used to measure patients body temperature which need 5V power supply
- Body Position Sensor: Here MMA 7361L accelerometer Sensor used to detect body position of sensor.

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It indicates patients fall detection. It is low power consumption sensor.

- Saline level indicator: here IR sensor fitted at bottom of saline bottle. When power supply given to sensor it starts working. IR rays transmit from liquid of saline bottle and reaches to receiver. When liquid present at path of sensor it records output voltage as 4.5v from IR sensor. This voltage set as threshold voltage of comparator. As soon as dripping starts liquid in saline bottle reduces and receiver gets more rays and output voltage measure as 5v. This voltage given as input to comparator and gives error signal which is inverted by inverter circuit and fed to RF transmitter. In this way continuous operation done. Receiver values read by processor when saline bottle finished it display on LCD and remote PC and alert message to doctors mobile through GSM
- Gas Sensor: Here MQ6 sensor used for detection of various poisonous gases and for air quality. It detects gas concentration anywhere from 200 to 10000ppm. It needs 5V power supply.
- Arm Cortex M3 Processor: It is 32 bit microprocessor having 64 kb SRAM, 512 on chip flash memory. It has in built ADC and gives fast response so we have chosen. It reads all sensor data display on LCD and remote PC.
- WSN: RF modem used to transfer and receiver sensor data through wireless. It help to receive data on LCD and remote PC
- GSM: it helps to send alert message to doctors mobile.

## IV EXPERIMENTAL RESULTS

Body position of patient is nothing but patient is in sitting or sleeping position and also detects free fall detection of patient. Temperature sensor detects temperature of patient in degree Celsius. IR sensor help to detect level of saline bottle and if bottle is finished then buzzer ON and Gas sensor senses various gases quality.

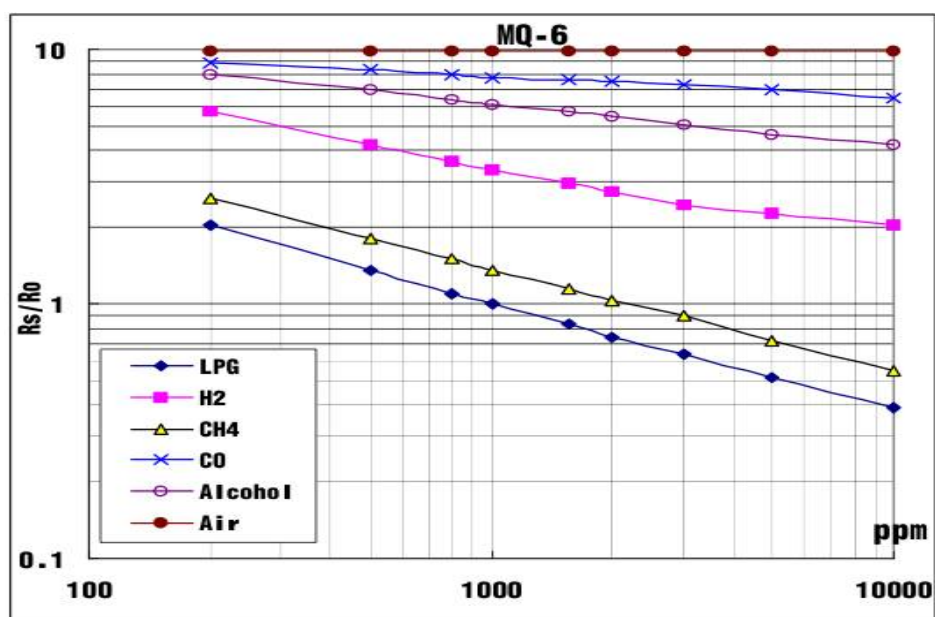


Figure 2: MQ6 Sensor

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Above figure shows graphical representation of sensitivity characteristics for several gases. Where  $R_0$ : sensor resistance at 1000ppm of LPG in the clean air,  $R_s$ : sensor resistance at various concentrations of gases. It has high sensitivity to LPG, iso- butane and propane. Small sensitivity to alcohol and smoke

### V. CONCLUSION

Thus device is portable at operated at low power record physiological parameters of patient such as body temperature, Body position, saline level indicator and gas level measurement. Display all sensor values on remote PC and LCD. If sensor values increased at abnormality level then alert message to doctors mobile. Hence it helps to get emergency treatment to patient and can recover speedily.

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